

DNA and Indigeneity



The Changing Role of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation

SYMPOSIUM PROCEEDINGS

October 22, 2015
Vancouver, British Columbia
Canada

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2016

This research was made possible, in part, through the support of the Intellectual Property Issues in Cultural Heritage (IPinCH) project, a Major Collaborative Research Initiative funded by the Social Sciences and Humanities Research Council of Canada.

Report To Be Cited As:

Walker, Alexa, Brian Egan, and George Nicholas (editors). 2016. DNA and Indigeneity: The Changing Role of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation. Symposium Proceedings. Intellectual Property Issues in Cultural Heritage (IPinCH) Project, Simon Fraser University, Burnaby, B.C.

Acknowledgements

Symposium proceedings compiled and edited by Alexa Walker, Brian Egan, and George Nicholas.

This event was developed by the Bioarchaeology and Genetics Working Group of the Intellectual Property Issues in Cultural Heritage (IPinCH) Project. Funding was provided by the Social Sciences and Humanities Research Council (SSHRC) of Canada through a SSHRC Connections Grant, and through Major Collaborative Research Initiative funding. Additional support was provided by Simon Fraser University and the SFU Archaeology Department.

Event planning was the responsibility of the Bioarchaeology and Genetics Working Group co-chairs: Alan Goodman, Dorothy Lippert, and Daryl Pullman, along with George Nicholas, Alexa Walker, and Brian Egan. Kristen Dobbin coordinated publicity, developed the program and related materials, and formatted this volume. The design of this volume was inspired by the *Indigenous Presence* report (Kovach, Carriere, Montgomery, Barrett, and Gilles, 2015), accessible via the University of Regina here: <http://bit.ly/1WMX21b>. Additional assistance was provided by Chelsea Meloche, Elizabeth Peterson, and Sarah Lison.

Transcripts have been lightly edited for clarity and continuity.

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PART ONE

INTRODUCTION
SIX CASE STUDIES

DNA & Indigeneity

ALEXA WALKER, BRIAN EGAN, AND GEORGE NICHOLAS

Rapid advances in human genetics are changing the way we think about our identity and connect to our ancestors. The analysis of DNA collected from ancient human remains, for example, can provide insights into human evolution, migration patterns, and, in rare cases, establish genetic links between ancient peoples and their contemporary relatives. These powerful new technologies have many other applications, ranging from their use in criminal investigations to learning more about family history through genetic ancestry tests. However, as with all new technologies, there are potential drawbacks and ethical challenges associated with the many different uses of human genetics, and THUS a need for caution in the application of this powerful new tool.

For Indigenous peoples worldwide, genetic technology raises many questions. Issues of identity are of particular importance given that scientific pronouncements about identity claims may have profound social, cultural, political, and economic consequences for Indigenous peoples. In particular, DNA is increasingly perceived as being able to substantiate claims to land and other identity-based rights, to provide genetic criteria for tribal enrollment, and to adjudicate the repatriation of ancestral remains to descendant communities. Using DNA in this manner may offer ben-

efits in the short-term but could have long-term drawbacks if DNA is seen as necessary to substantiate or “prove” oral histories and traditional knowledge.

These pressing issues were at the heart of a public symposium and workshop held in Vancouver, British Columbia, in October 2015. The event, entitled *DNA and Indigeneity: The Changing Role of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation*, was hosted by the Intellectual Property Issues in Cultural Heritage (IPinCH) project¹, an international and interdisciplinary research initiative based at Simon Fraser University (SFU). The event had two main objectives: 1) to examine the ethical, legal, and scientific prospects and perils surrounding the use of genetic information to inform and, in some cases, substantiate claims of identity and cultural affiliation; and 2) to identify the real-world implications of genetic analysis in relation to Indigenous rights, tribal enrollment, and the repatriation of human remains.

¹ The IPinCH Project (2008–2016) is an international research collaboration providing research, knowledge, and resources assisting academic scholars, descendant communities and others in negotiating equitable terms of cultural heritage research and policies. For more information on IPinCH and to access the wide range of resources it provides, visit www.sfu.ca/ipinch

The primary focus was on the implications of these issues for Indigenous peoples in North America, but we also had an opportunity to consider them in a broader international context, aided by presentations focused on Australia and Mexico.

The three-day event began on October 22nd with a well-attended public symposium held at SFU's Harbour Centre campus in downtown Vancouver. The symposium focused on current and prospective applications of genomics in archaeology and anthropology, with presentations by ten individuals who also participated in the two-day international workshop held on October 23-24th. Following an opening song and prayer by Victor Guerin of the Musqueam Nation, the symposium was introduced by George Nicholas, IPinCH Director and Professor of Archaeology at SFU.

The first session focused on the promise and perils of using genomics to construct and interpret Indigenous identities and featured presentations from Armand Mint-horn, a religious leader and member of the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation, Deborah Bol-nick, Associate Professor at University of Texas at Austin, and Alan Goodman, Professor of Biological Anthropology at Hampshire College.

The second session explored the potential for genetic information to assist with the repatriation of human remains. Speaking to this topic were Daryl Pullman, Professor of Medical Ethics at Memorial University of Newfoundland, Dorothy Lippert, from the Repatriation Office at the Smithsonian Institution, and Cressida Fforde, Deputy Director of the National Centre for Indigenous Studies at the Australian National University.

The final session examined the problematic history of genetic research with Indigenous peoples before turning to the present to identify opportunities to work together “in a good way.” Kimberly TallBear, Associate Professor at the University of Alberta, Rosalina James, Assistant Professor at the University of Washington, and Ripan Malhi, Associate Professor at the University of Illinois at Urbana-Champaign, all provided their insight and experiences on this topic.

The public event was followed by a two-day invitational workshop attended by 19 scholars, practitioners, and community representatives from Canada, the United States, Australia, and Latin America². Seeking to delve further into the broad themes introduced in the symposium, workshop discussions centered on three topics: 1) DNA and the Repatriation of Human Remains; 2) Land and Other Identity-Based Rights;

2. Symposium and workshop participant biographies are found at the end of this volume (Appendix A).

and 3) Genetic Identities and Tribal Belonging (see Appendix B).

Ultimately, the workshop was successful in bringing together community advocates, researchers, and practitioners to assess the current state of ancient DNA research and to begin developing ethical guidelines, protocols, and safeguards to accompany this rapidly developing technology. The various products emanating from the symposium and workshop, including this initial proceedings volume, are intended to help researchers, communities, and other stakeholders to address challenges emerging at the crossroads of genetics and identity.

More information about the event, including videos of the formal presentations, can be found at www.sfu.ca/ipinch.

With this, the proceedings volume, we detail the findings of the event, including transcriptions of the formal symposium presentations and a summary of the workshop discussions. The event highlighted the complex and multifaceted questions that arise when genomics is used in the interpretation of Indigenous identities and we’ve tried to capture these concerns in the pages that follow.

SIX CASE STUDIES

Throughout the symposium and workshop, a number of case studies provided important points of reference. Some, such as the Kennewick Man case, were relatively familiar to all participants and the symposium audience; others not. Here we provide a brief description of six prominent cases, along with additional sources of information

on them. These are: 1) Kwäday Dän Ts’ínchi; 2) Anzick Child; 3) Kennewick Man; 4) Dodge Island and Lucy Island Ancestors; 5) China Lake Ancestors; and 6) Big Bar Lake Woman.

HAPLOGROUP

A haplogroup is a group of individuals who share a common genetic mutation that is passed down from an ancestor on the maternal or paternal line.

Kwäday Dän Ts’ínchi

The frozen remains of the individual known in the Southern Tutchone language as the Kwäday Dän Ts’ínchi (or “Long Ago Person Found”) were discovered in 1999 in Tatshenshini-Alsek Park, located in far northwestern British Columbia within the traditional territory of the Champagne and Aishihik First Nations (CAFN). Tests conducted with permission from CAFN suggest that the person found was a young man between 18 to 20 years old and in good health. Objects found with the Kwäday Dän Ts’ínchi man, including a hand tool, a woven hat, several garments made of hide and fur, and a small pouch believed to be a medicine bag, were dated to approximately 500 years ago. Local oral histories suggest that the Kwäday Dän Ts’ínchi man might have been a young hunter who urged his hunting companions to leave him behind after he was injured. DNA tests demonstrate that the Kwäday Dän Ts’ínchi man belongs to haplogroup A and was found to

have close genetic affinities to the Canadian Inuit and Chukchi people from Northeast Asia, as well as the Athapaskans and Tlingit. As Hebda *et al.* (2012: 52) point out, it was important to CAFN and other communities to connect with the Kwäday Dän Ts'ínchi man on a person-to-person basis because of cultural obligations they hold towards him to ensure that he received proper burial rites. Ultimately, 17 First Nations individuals from northern British Columbia and the Yukon were identified as “living relatives” of the Kwäday Dän Ts'ínchi man. Moreover, the living relatives’ clan affiliations suggest that the Long Ago Person found was likely of the Wolf or Eagle clan (Hebda *et al.* p. 53).

Further reading: Hebda *et al.* 2011; La Salle and Frankenstein 2015.

Anzick Child

In 1968, the remains of a young child were discovered on a private ranch in Western Montana. The child, whose remains were dated to 12,600 years ago, is often referred to as the “Anzick child” (or Anzick-1) after the name of the family who owned the ranch. Accompanying the red ochre-covered remains were carved fragments of elk bone and stone tools characteristic of the Clovis culture.³ Because the remains were found on private property they were not subject to the Native American Graves Protection and Repatriation Act. In 2009, a research team including Sarah Anzick, daughter of the

ranch owners, and Eske Willerslev, a leading expert in ancient DNA, successfully analyzed genetic samples from the child’s remains. The results show that this child belongs to a population that is more closely related to all Indigenous groups in North America than anywhere elsewhere in the world. Consultation was undertaken with nine Montana tribes about the ancient DNA study. Tribal representatives emphasized the importance of reburying the individual according to traditional ceremonial practices, which was carried out in June 2014.

Further reading: Rasmussen *et al.* 2014.

Kennewick Man

In 1996, the remains of Kennewick Man, referred to as the Ancient One by the local Umatilla tribe, were found eroding out of a riverbank along the Columbia River in Kennewick, Washington. Radiocarbon dating revealed the remains to be over 9,000 years old. An initial assessment of Kennewick Man’s remains led one anthropologist to claim that the Ancient One possessed a “Caucasoid-like” cranium. This assertion ignited a heated debate over the identity and ancestry of this ancient individual, with five local Native American tribes arguing that he is their ancestor and should be returned to their care. A group of scientists opposed these claims and sought to gain access to and control over the remains for scientific purposes.

In 2002, a United States court concluded that the Ancient One’s remains “were not subject to the

Native American Graves Protection and Repatriation Act’s (NAGPRA) provisions because they could not be determined to be Native American” working under the definition that Native American means “of or relating to, a tribe, people, or culture that is *presently-existing* in the United States” (Burke and Smith 2008:22)

Ongoing efforts to sequence Kennewick Man’s DNA were finally successful in 2015. As expected by many, the genetic analysis revealed “Kennewick Man is closer to modern Native Americans than to any other population worldwide” (Rasmussen *et al.* 2015:455).

The analysis concluded that, based on the genome-wide data available, the Confederated Tribes of the Colville Reservation—one of the tribes claiming Kennewick Man—are closely related to Kennewick Man. Given the additional genetic evidence that has come to light, it appears likely that the case to repatriate Kennewick Man will be reopened.

On April 27, 2016, the U.S. Army Corps of Engineers officially announced the Kennewick Man was Native American⁴, based on recent DNA testing, verifying what Native Americans had proclaimed since his discovery 20 years ago.

Further reading: Rasmussen *et al.* 2015; Burke *et al.* 2008; Owsley and Jantz 2014.

3. The Clovis culture or tradition is considered by archaeologists to be one of the first cultural traditions found in the Americas, and dates to approximately 13,500 to 12,500 years ago.

4. See: US Army Corps of Engineers, “Corps determines Kennewick Man is Native American,” April 27, 2016: <http://1.usa.gov/20TP3xx>

Dodge Island and Lucy Island Individuals

The remains of four ancient individuals were uncovered during excavations from the 1960s to 1980s on Dodge Island and Lucy Island, both located along the northwest coast of British Columbia. Radio-carbon dates estimated that the individuals lived between 6,000–2,000 years ago

In 2013, the results of an ancient DNA study conducted in partnership with the Lax Kw'alaams, Metlakatla, and Laxgalts'ap First Nations were released. In addition to the four ancient genomes, three living Tsimshian, Nisga'a, and Haida individuals provided DNA samples for comparison. The authors were able to identify a genetic relationship spanning over 5,000 years between two ancient individuals and a living Tsimshian person.

The results of the study were welcomed by local First Nations who saw it as further evidence of their ancestors' long-term occupation of their traditional territory.

Further reading: Cui *et al.* 2013.

China Lake Ancestors

In 1982, two individuals dated to over 6,000 years ago were found in a single burial site near China Lake, British Columbia. Genetic results found that both individuals belong to haplogroup M. Prior to this study, haplogroup M had not been found in any ancient or living North American populations. The results indicate that we still have much to learn about human expansion into the Americas.

Further reading: Malhi *et al.* 2007

Big Bar Lake Woman

The remains of a woman dated to 5,000 years ago were uncovered at a site near Clinton, British Columbia. With permission of the Canoe Creek and High Bar Indian Bands, samples were sent for mitochondrial DNA analysis. The woman was found to belong to haplogroup A, a common mitochondrial haplogroup among Indigenous peoples in North America. The close geographic proximity but very different genetic profiles of the Big Bar Lake woman and the China Lake individuals suggest that the genetic diversity of ancient populations may be greater than previously anticipated.

Further reading: Cybulski *et al.* 2007.

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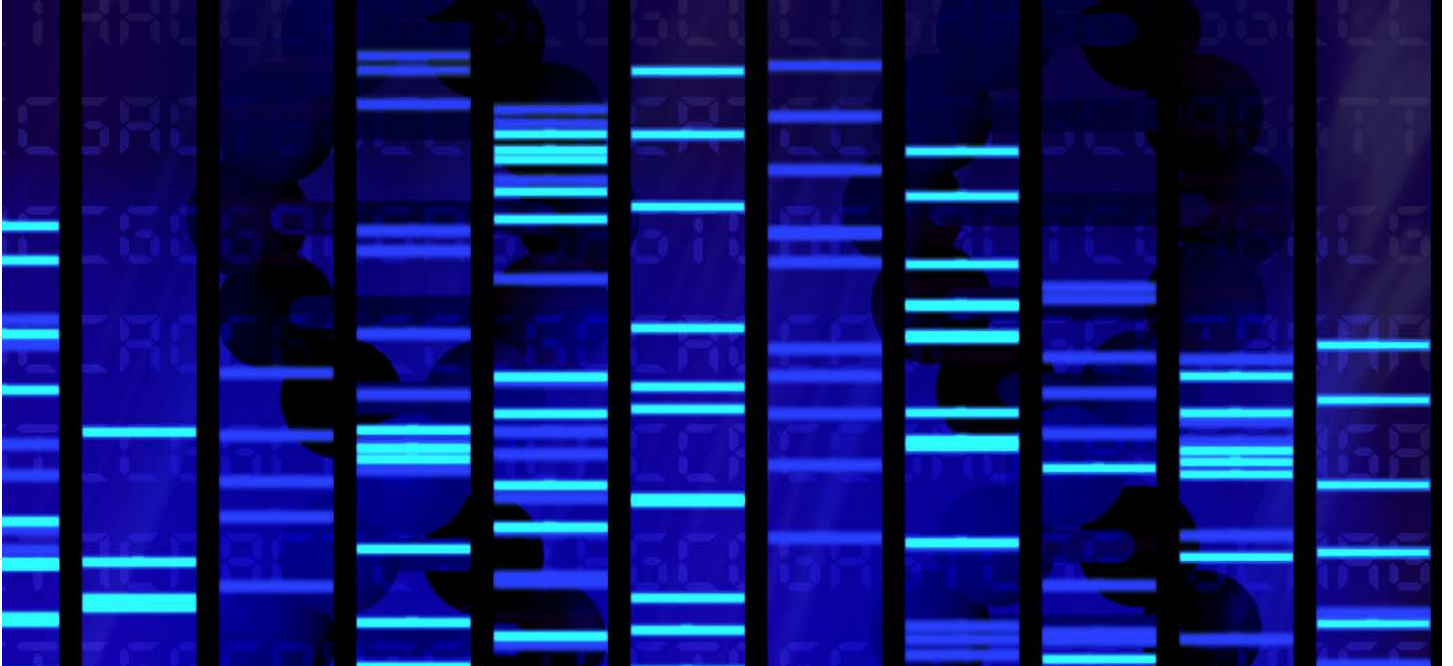
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PART TWO

SYMPOSIUM
PRESENTATIONS

Who Are We?: Symposium Introduction

GEORGE NICHOLAS

Video available online:

www.sfu.ca/ipinch/resources/videos/nicholasguerin-dna

Welcome. I call us all together here on unceded Coast Salish territory. Thank you to the Elders and the community members who are here today to take the words that you hear and to share them beyond this room. My name is George Nicholas and I'm the Director of the Intellectual Property Issues in Cultural Heritage (IPinCH) Project that has organized this event.

To start with, the topic of today's symposium is "DNA and Indigeneity: The Changing Role of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation" — all topics of great importance. This is especially true because such issues affect people's identity, heritage, and everything that flows from those.

I would like to start with one of my favourite paintings by Paul Gauguin, "Where Do We Come From? What Are We? Where Are We Going?"

In one sense, this painting's title encapsulates the nature and goals of Anthropology and the study of human diversity. But it also captures what we are discussing here today—the question of "who are we?" and "how do we know who we are?" In some cases, we know the answer to these questions because it has been passed down



through previous generations. In other cases, we are able to answer these questions through scientific knowledge and other means.

Living in the "Age of Genomics" has had a substantial impact on how we understand "who we are." We are now able to trace the movements of ancient populations as they expanded across the globe.

In some cases, living peoples have been able to identify their genetic ancestors. Moreover, DNA can demonstrate continual occupation of traditional land by a genetically similar group of people. And now, DNA is in everyone's hands. Everyone has the tools to figure out who they are through DNA tests. I had one such offer appear in my email inbox two days ago.

Many of you have likely encountered similar email or magazine ads that promise to tell you "Who

Figure 1. Paul Gauguin, "Where do we come from? What are we? Where are we going?" (1897). Museum of Fine Arts, Boston. <http://bit.ly/1Exlx3Q>

For a few more hours, get free shipping on AncestryDNA

The more you test, the more you can discover. Each additional family member you test can reveal new details about your family story.

Only \$99 WITH FREE SHIPPING*

Order now

Ends tonight at 11:59 p.m. ET

Figure 2. Portion of an e-flyer from AncestryDNA, one of a number of companies offering relatively inexpensive genetic profiling.

you are," *genetically speaking*, for only \$99. But is it really that straightforward? What is this DNA test actually telling you and what information is it leaving out? These are some of the questions that will be explored today.

It is important to recognize that such DNA tests offer us a host of new ways to think about who we are. But—and there's always a "but" when we're talking about new technologies or a new ways of thinking—if you tease apart a

strand of your own DNA, you'll be confronted with many interconnected issues, including the myth of biological "race," questions about ownership and intellectual property rights, biological versus cultural identity, and protecting human rights in genetic research. These are some very challenging, very slippery, and very difficult issues that affect individuals, groups, nations, and all humanity. And this is just a partial list.

This brings me to an important point that I'd like to emphasize: there are remarkable research opportunities in front of us. However, genetic technology brings with it a great deal of responsibility because we are literally dealing with people's lives. The stakes are high in genetic research. If we are not aware of this from the start, then such projects should not move forward. Part of the difficulty is that an individual may consent to have their DNA tested, but this analysis will also reveal information about that person's family. Thus, the decision to do a DNA test doesn't just involve the individual. A person's decision to go ahead with DNA testing might bring others into the conversation, whether they want to be there or not.

We will be touching on a wide variety of topics today in this symposium and in the two-day workshop that follows. It's important to note that we are dealing not only with issues of identity but also of politics, religion, human rights and social justice, and much more. We have some of the leading scholars, practitioners, community activists, and religious leaders who

are involved in these conversations with us today. They are here to share with you some of their experiences and insights. But this is also an opportunity for all of us to engage in an afternoon of mutually beneficial understanding of, respect for, and awareness of responsibilities related to DNA and Indigeneity. We are all here together to work "in a good way."

Recommended Resources

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2014 Native American DNA: Ethical, Legal, and Social Implications of an Evolving Concept. *Annual Review of Anthropology* 43(1): 155–166.

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THEME 1

Constructing Biogenetic Identities — What are the Limitations?

Drawing upon examples from cutting-edge ancient DNA research, Armand Minthorn (Confederated Tribes of the Umatilla), Deborah Bolnick (University of Texas at Austin), and Alan Goodman (Hampshire College) explore the tenuous act of balancing the benefits and drawbacks of using genetic information to understand Indigenous identity, past and present. Will genetic analyses illuminate new connections between ancient and modern peoples? If yes, what exactly do these new relationships mean? How does genetic information complement or contradict other forms of knowledge from archaeology and oral history? On a practical level, how do we balance and contextualize genetic and other biological information in its broader historical, social, and political context?

The speakers in the first symposium session, “Constructing

Biogenetic Identities—What are the Limitations?” explored these and many other questions. In his presentation, Armand Minthorn shares the story of Kennewick Man, or the Ancient One, from his perspective as a member of the Confederated Tribes of the Umatilla, and makes the case for his repatriation. At the heart of his talk is the importance of respect: respect for traditional lifeways and knowledge, for different worldviews, and for the remains of ancestors. To this day, what will be the final resting place of Kennewick Man, or the Ancient One, remains a highly debated question.

Recent advances in genomic technologies have made it increasingly feasible to collect genetic data from ancient human remains. Deborah Bolnick’s presentation considers the benefits and risks of using ancient DNA to establish cultural affiliation and substanti-

ate repatriation or land claims. She cautions that all assessments of genetic relatedness must be grounded in what we know more generally about human genetic diversity. Ultimately, this presentation explores a key question: What do—and don’t—genetic analyses tell us about relatedness, identity, and shared culture?

While it is typically understood that identities are multiple and fluid, the same instability applies to human biology. Alan Goodman explores the controversial assessment of Kennewick Man’s skull as an entry point into a larger discussion surrounding the subjectivity of craniometric analyses and, more broadly, biological and “racial” categories. This presentation highlights the potential shortfalls of using biology to suggest the identity and ancestry of ancient ones, specifically Spirit Cave and Kennewick Man.

Bringing the Ancient One Home: Genetic Data and the Case for Repatriating Kennewick Man

ARMAND MINTHORN

Video available online:

www.sfu.ca/ipinch/resources/videos/minthorn-dna

First, in my language I'd like to acknowledge the welcome from my brother [Victor Guerin] and to acknowledge the people that lived here a long time ago.

I want to thank George and the people that organized this. This is only the second time I've been to Canada and I found out my phone doesn't work here and the money here is different, some of the people here don't want American money. I found that out. It's good to be here.

My name is Armand Minthorn, I'm with the Confederated Tribes of the Umatilla and we are in Eastern Oregon. Our tribe is composed of three tribes: the Umatilla, Walla Walla, and Cayuse. Our reservation is about 176,000 acres and our tribal membership just two months ago topped 3,000 people, so we're a fairly small confederation. We are a treaty tribe. We signed a treaty with the United States government in 1855 where we ceded away 6.4 million acres of land, which are in the states of Oregon, Washington, and Idaho. We still retain our treaty rights in that ceded area to hunt, to fish, to gather roots and berries.

I sit on the Board of Trustees, the governing body of our tribe. I've been on the governing body since 1995 and I have the scars to prove it. I do. I sit on the tribe's Cultural Resources committee as chair, amongst other committees within the tribe for federal and state agencies. I was recently selected by the U.S. Secretary Department of the Interior to sit on the NAGPRA review committee. These are some of the duties I have and the work I do with my tribe.

"Oytpamanatity" — Can you folks say it with me? That's the name that we gave to the Kennewick Man. It means "Ancient One." We as the five tribes, Umatilla, Colville, Nez Perce, Yakama, and Wanapum have been working to have Kennewick Man repatriated since 1996. Ever since the Kennewick Man was discovered or actually eroded out of the bank along the Columbia River, we have always claimed that he is Native American. Our belief was only reconfirmed by Dr. Eske Willerslev, a scientist in Copenhagen, Denmark. The results of the DNA analysis were released in June of this year (Rasmussen et al. 2015) and the DNA results said very clearly that Kennewick Man is Native American. It was DNA submitted by the Colville tribe and the DNA matched with Kennewick Man. We have always said this and we have always believed it.

REPATRIATION AND NAGPRA

Repatriation refers to the return of archaeological materials and ancestral remains to culturally affiliated federally recognized Native American tribes. In the United States, repatriation is legislated by the Native American Graves Protection and Repatriation Act (NAGPRA), enacted on November 16, 1990. NAGPRA governs the process by which cultural items, including human remains, funerary objects, sacred objects, or objects of cultural patrimony, can be returned to lineal descendants and culturally affiliated Indian tribes and Native Hawaiian organizations. Canada does not have any similar legislation to NAGPRA. Instead, repatriation is carried out through coordination and collaboration between research institutions, museums, and Indigenous peoples.

NAGPRA defines "Native American" as "of, or relating to, a tribe, people, or culture that is Indigenous to the United States." For ancestors who are thousands of years old, such as Kennewick Man, it can be difficult to meet this definition of Native American. In 2002, a United States court found that Kennewick Man could not be determined to be Native American and permission was given to a small group of scientists to continue research on his remains.

Many people have asked, "why do you think Kennewick Man showed himself?" The old people at home have always tried to show us and

tell us how important our way of life is. Our language, our songs, our traditions, our religion, our culture, our Indian food, and the land we live on: they're all one and the same. Some of our old people have told us that maybe Kennewick Man and other ancestors who we have gotten back from federal agencies, museums, and universities maybe revealing themselves was their way to strengthen your way of life, your Indian way of life, so you don't forget where you come from and you don't forget where you're going. Maybe this is the message they're trying to send to you, to all of us.

We don't have in our culture or tradition anything that tells us how to rebury ancestors, but we've adapted. We've adapted. We didn't change anything in our lifeways or our lifestyle, we only adapted. We didn't change anything with our language, our songs, our traditions—none of that was changed. We've only adapted and now we take care of our sacred ancestral remains today.

Our old people have told us over and over and over these ancestral remains are sacred. Period. End of discussion. They should be treated as such. Our ancestral remains are not artifacts. They should not be treated as artifacts. They are not a means for study. They are not a means for display. They are a means for us, as Indian people, to take care of them as best we can. How to do this is for the tribes to decide and not museums, universities, or federal agencies. It's tribes that decide that and no one else. One man said one time "why don't you want your ancestors to be

studied?" I told him, because we already know. We know how this world was created, our songs, our language, our traditions and customs tell us that. We know where our ancestors lived and died. The archaeological record is very clear. We also know as Indian people, wherever you come from, how this world will end. Our language, our song, our traditions tell us that.

Another man asked "don't you want to know how your ancestors crossed the land bridge?" I told this man, "No, We did not cross a land bridge. We were created here." It's because our language, songs, traditions, and customs tell us that. It's not for me or any other person to say any different. This is what we believe and it's not any different than how you may believe. We as Indian people know there is one God. We know that. My religion isn't any better than yours. It isn't. And no one can say their religion is better than mine or yours. In order for us to get along with each other, we have to take into heart and mind those people that were before us. I'm not here to convert anybody. One man said once, "You're a religious zealot." I said, "Okay, whatever that is." But Eske Willerslev, one of the top scientists in the world, invited the claimant tribes to go back there and see his facility in Denmark, and to see how the DNA testing was done, and we got to see those machines that he uses. Science changes fast. It's going to change next year. It's one of the fields that are rapidly changing.

When we were in Copenhagen, all of the tribes said the same thing: people need to be careful with science. Very careful with science. And it is good to know what science can do, but science is going to create a lot of questions and a lot of people won't be happy or accept those answers. This is what we told him. You need to be very, very careful with science. Wherever people come from, we're all going to have to live and work side by side. And we don't want science to say "you're different" and therefore I'm going to treat you differently. We don't want that. We truly believe that science can have some benefits, but only if those benefits are controlled. There's a difference. I'm not a scientist. I only have a GED¹. That's all. However, there are many old people that still are in my heart and mind. I remember and think about and echo their teachings so that they can continue to teach me and my people. That's what tradition and oral histories are about. But again, wherever we come from people need to understand we have our own way of life, our own language, our own traditions, and our own food. They need to understand that. As an example, I went to Chicago not too long ago. I don't know what it is about people but they have to feel my hair. I don't know what it is about my hair. They ask to feel it and they go "Are you Indian?" I've heard that so many times. And then I also hear a lot of "my great-great grandmother was a Cherokee princess." I've heard that so many times. I have! I say "Well, that's good!"

1. General Educational Development credential.

People have to understand that not all Indians are the same. We're not. We're not like the Indians on TV. We're not. Again, I just want to emphasize that we will get Kennewick Man back. We have legislation now in the U.S. Congress that Senator Patty Murray introduced and we will reburial the Kennewick Man, us as five tribes. That's our goal. We've been working on it for over 15 years. But this is what our old people have told us in the past and this is what they tell us today: take care of this ancestor. We are doing the best that we can. It's institutes like this that can help us and other tribes, but it needs to be done in a careful way.

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The Risks and Benefits of Inferring Relatedness, Identity, and Cultural Affiliation from Ancient DNA

DEBORAH BOLNICK

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-bolnick

I want to thank everyone for having me here today. I'm here from the University of Texas at Austin. I am of Eastern European and Jewish heritage, and my ancestors moved to the United States about a century ago. My work focuses on the intersection of genetics, history, and culture.

As we've heard today, recent technological advances have made it feasible to collect a kind of data from ancient human remains that many never imagined possible just twenty or thirty years ago. In this time, we've gone from the very first studies reporting the survival of ancient DNA in bone (Hagelberg *et al.* 1989) to the publication of complete genomes of ancient individuals (Rasmussen *et al.* 2010, 2014, 2015).

Only a handful of ancient genomes have been fully sequenced so far, but having the ability to collect genome-wide data from ancient individuals has really opened the door to using ancient DNA in new ways. For example, with genome-wide data, we can now get a much clearer picture of an individual's genetic makeup and biological ancestry.

This means that there is an increasing likelihood that ancient DNA will guide our understandings of identity and Indigeneity, as well as our inferences about relatedness, cultural affiliation, and community histories. I have three reasons for saying this. First, using ancient DNA in this way would tap into widespread interest today in using DNA to trace ancestry and population history. Second, because Western understandings of relatedness are largely biogenetic in nature, we give DNA substantial power to adjudicate questions about anything associated with relatedness. Ancient DNA is therefore seen as being relevant to a wide array of social, cultural, political, and legal questions—questions about identity and group membership, land claims, and the cultural affiliation and repatriation of human remains. And third, some Indigenous groups have already started to use genetic data to support repatriation and territorial claims.

I'd therefore like to use the next few minutes to consider the benefits and risks of using ancient DNA in some of these contexts. Specifically, I want to ask three questions: 1) What do—and don't—ancient DNA studies tell us about ancestor-descendant relationships, identity, and shared culture?; 2) What are the implications and consequences for Indigenous peoples if we rely on genetics to establish and sub-

DNA (DEOXYRIBONUCLEIC ACID)

is a sequence of some three billion nucleotides that encodes genetic information. DNA is found in all living things, and is sometimes preserved in ancient human, animal, or plant remains. Because nucleotide sequences vary among individuals, groups and species, DNA is useful in identification and showing genetic/evolutionary relationships.

MITOCHONDRIAL DNA (MTDNA)

is found in the mitochondria of cells and used to trace maternal ancestry as it is passed from a mother to her children. MtDNA is more likely to be preserved in ancient samples because there are many more copies per cell than nuclear DNA.

Y-CHROMOSOME DNA is a type of nuclear DNA that is only present in males and used for tracing paternal ancestry.

NUCLEAR DNA contains the most information about an individual, but often there isn't enough preserved in archaeological samples for study.

stantiate these connections for the purposes of repatriation and land claims?; and 3) Are there trade-offs if we use genetics in this way? In other words, could there be short-term benefits but long-term drawbacks?

To help answer these questions, I discuss two recent high-profile ancient DNA studies where ances-

tor-descendant relationships and cultural identity were inferred from genomic data. The first case study, by Cui *et al.* (2013), reported the complete mitochondrial genomes, or mitogenomes, of four ancient and three living individuals. This map shows the study area, which is located on the north coast of British Columbia.

The remains of two individuals were found on Lucy Island in the Prince Rupert Harbour area. One was radiocarbon dated to 5,530 years before present (BP) and the other to 5,930 BP. Remains of two other individuals were found on nearby Dodge Island, and were dated to 2,830 BP and 4,680 BP. Finally, mitogenomes from three living individuals sequenced in this study came from Tsimshian-speaking communities that live nearby.

In this study, Cui *et al.* (2013) found that the 5,500-year-old individual from Lucy Island exhibited the same maternally-inherited mitochondrial lineage as the 2,800-year-old individual from Dodge Island. They also identified one living Tsimshian speaker who belongs to this same A2ag lineage. In addition, Cui *et al.* (2013) found that the 4,700-year-old individual from Dodge Island exhibited a mitochondrial lineage found today in two Tsimshian speakers in nearby communities. Thus, these results demonstrate that at least three individuals living in the Prince Rupert Harbour area today are genetically related to people who lived there 2,800, 4,700, and 5,500 years ago.

This was a really exciting finding for the First Nations communities

who participated in this study. The results fit with their oral and written histories, which state that their ancestors have lived in this territory for thousands of years. The press release about this study, and the various media reports that followed, all emphasized this point. For example, one participant and co-author of the study said: “Having a DNA link showing direct maternal ancestry dating back at least 5,000 years is huge as far as helping the Metlakatla prove that this territory was theirs over the millennia” (Yates 2013). Another commented, “It’s very exciting to be able to have scientific proof that corroborates what our ancestors have been telling us for generations” (Yates 2013).

The emphasis here is on the science *proving* the community’s territorial claims by confirming a direct ancestor-descendant relationship with ancient inhabitants in the region. This point was explicitly made in several other news articles, including one article that noted that “this scientific achievement is also seen to have significant implications for First Nations’ land claims and treaty rights, giving Aboriginal groups a powerful new tool for demonstrating deep-rooted links between the present and hyper-distant past” (Boswell 2013).

Thus, this is an example of ancient DNA being used very effectively to support an Indigenous community’s territorial claims. Using genetic data in this way has some obvious benefits, but I also want to consider some potential risks for communities, especially if we begin to depend on DNA to estab-

lish or mediate land claims more frequently.

First, if we use scientific data to “validate” Indigenous knowledge, does that mean that we believe scientific knowledge is superior to Indigenous knowledge? Does it imply that Indigenous knowledge without scientific support is inaccurate and to be discounted? I hope the answer is no, but I think we need to consider whether these kind of genetic arguments could inadvertently undermine Indigenous knowledge and sovereignty.

Second, we need to be cognizant of the potential complications that could arise if claims are based on small sample sizes and limited genomic data. For example, in the Cui *et al.* (2013) study, they reported the mitogenomes of just four ancient and three living individuals. Because only a handful of mitogenomes have been published from ancient inhabitants of the Pacific Northwest, we don’t really know how rare or how widespread a specific mitochondrial lineage was 2,800 or 5,500 years ago. This means that we don’t know if the A2ag lineage is found only in the ancestors of Tsimshian-speaking communities, or if it was more common and found in other groups as well. If it was found in others, and if people moved in and out of the Prince Rupert Harbour area over time, the mitogenome alone is not enough to tell us if these ancient individuals were directly ancestral to the Tsimshian speakers sampled in this study. It’s possible that they were only distantly related: more like distant cousins who share the

A2ag lineage, rather than grandparents and grandchildren. In that case, they might exhibit the same mitochondrial lineage, but only because each inherited it independently from a much earlier maternal ancestor.

I do want to note, however, that there is archaeological evidence of cultural continuity in the Prince Rupert Harbour area over time, as well as very detailed oral histories that tell the same story. Given this information, an ancestor-descendant relationship is more likely here than a scenario involving population change. In addition, more recent analyses of genome-wide data from the same individuals are consistent with population continuity throughout time (Raghavan *et al.* 2015).

However, we do know from genetic studies in other parts of the world that people do move and diversity patterns have sometimes shifted drastically over time. Some mitochondrial lineages were more common in the past than they are today, and others have disappeared from one group, but not from another, just by chance. Thus, to establish an ancestor-descendant relationship and population continuity through time using genetics, we need genome-wide data and specific statistical tests of such a relationship. If taking this scientific approach, we also need ancient DNA samples from an appropriate geographical area and relevant time periods. Perhaps the take-home message here is that ancient DNA studies can easily identify genetic *relatedness*, but it may be more difficult to establish

direct ancestor-descendant relationships with certainty. In light of this, I think we may want to consider whether direct ancestry is even necessary to justify territorial claims.

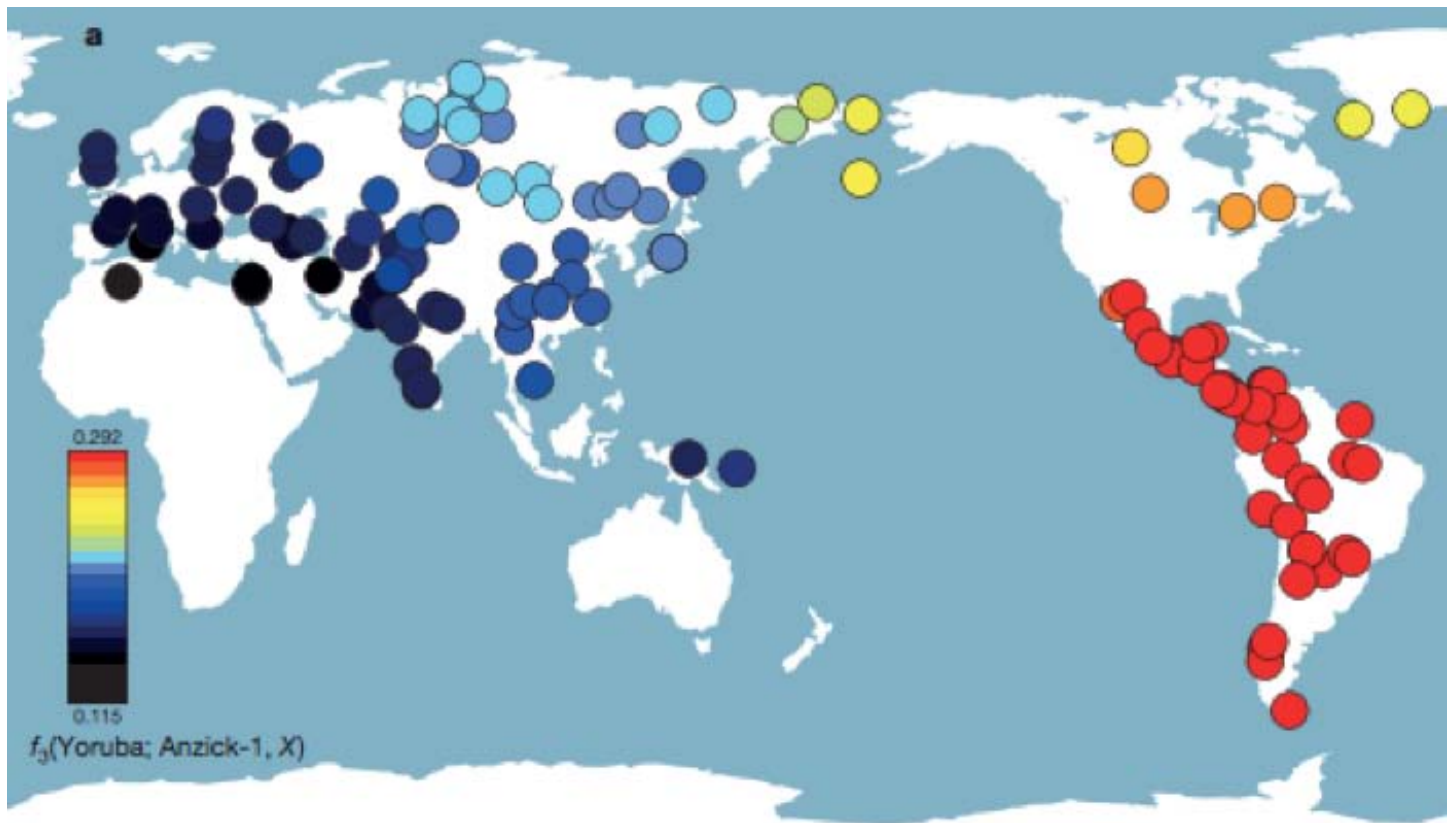
Finally, complications can arise when using DNA to assert or mediate land claims if we don't know how rare or widespread a particular genetic lineage is today. To continue with the same example, the A2ag lineage seems rare today, based on the individuals who have been sampled so far. However, those sampled represent just a small fraction of the Indigenous people living in the Pacific Northwest. What happens if subsequent research identifies the same mitochondrial lineage in other Indigenous groups? Would that cast doubt on or invalidate the claims of the Metlakatla that the ancient Lucy and Dodge Island individuals were affiliated with them, or that they have lived in their territory for thousands of years? Would that give other groups the right to lay claim to the same land?

I don't have answers to these questions, but I think it's important that we consider these possibilities. We do know from other genetic studies that most mitochondrial lineages are not restricted to a single linguistic or cultural group. It is therefore quite possible that future genetic research may identify the same lineage in other communities. Given this possibility, we need to carefully consider the role we want DNA to play in mediating land claims, since it could be a double-edged sword.

I'd like to now turn to a second case study to help us understand the benefits and risks of using ancient DNA to establish or adjudicate repatriation claims. This study was published in 2014 and reports the genome of a young child who was buried at the Anzick site in Montana, approximately 12,600 years ago (Rasmussen *et al.* 2014). Known as Anzick-1 this boy's DNA shows that he was closely related to present-day Native Americans, and he belonged to a population that was ancestral to many Indigenous Americans alive today.

Because the boy's remains were found on private property, the Native American Graves Protection and Repatriation Act (NAGPRA) did not apply, and the scientists did not consult with any tribes before analyzing the child's DNA because they saw him as culturally unaffiliated. However, once the researchers had enough data to be confident that the child was genetically related to contemporary Native Americans, they did consult with Native American groups about what should be done with the child's remains once the study was completed.

Thus, in this case, the genomic results played a critical role in convincing scientists to carry out consultations and accept the reburial of the Anzick-1 child. This study shows that ancient DNA can be used to facilitate the repatriation and reburial of remains that are considered culturally unaffiliated, and it could have a role to play in supporting or adjudicating other repatriation claims.



Of course, it's important to note that while ancient DNA may offer some benefits, many Indigenous communities are still not comfortable with having ancestral remains studied in this way. It would therefore be deeply problematic if ancient DNA came to be seen as an essential component of repatriation requests. Luckily, I don't think that's likely to happen, especially in the United States, because NAG-PRA states that remains can be repatriated to lineal descendants or culturally affiliated tribes.

Nevertheless, I think we need to consider how much we want to let ancient DNA guide our consultation processes and repatriation decisions, both with lineal descendants and culturally affiliated groups. In the case of Anzick-1, he has no direct lineal descendants because he died before reaching

the age of two. Therefore, his DNA can tell us about his relatedness to contemporary peoples, but it cannot be used to establish direct ancestor-descendant relationships.

Nor does DNA tell us the cultural affiliation or cultural identity of an ancient individual. As many studies of human genetic diversity have shown, there is not a simple or clear-cut link between a person's genetic makeup and their cultural identity. In these situations, though, we might be tempted to make a somewhat questionable assumption and treat genetic similarity as a proxy for shared culture. We could then try to infer Anzick-1's cultural affiliation from his genetic affinities with present-day individuals. In this case though, that would actually lead us to a rather odd outcome.

Figure 1. Comparing the degree of genetic affinity between Anzick-1 and Indigenous populations around the world, with red circles indicating close genetic affinity. Reprinted with permission from Macmillan Publishers Ltd: Nature 506: 225-229.

Figure 1 from Rasmussen *et al.* (2014) shows the genetic affinities of the Anzick-1 child with various Indigenous groups in the Americas today. The warmer the colour (the darker the red), the greater the genetic similarity of that particular contemporary group to Anzick-1. Other colours (e.g., yellow, green, and blue) indicate decreasing genetic similarity with him.

Thus, this figure shows that the Anzick-1 child is most closely related to contemporary Central and South American populations (Rasmussen *et al.* 2014). He's less closely related genetically to the contemporary North American populations that were sampled. This was

a rather surprising finding, and it raises questions about how we should approach consultation and repatriation after collecting ancient DNA data. Should the ancient DNA data guide our consultation and repatriation efforts? If so, does the genetic similarity between Anzick-1 and Central/South Americans mean that they should have been consulted regarding his reburial? Should the cultural rituals and burial practices of one or more of these groups have been followed when the remains were reburied? And who in particular should be consulted when the genetic data indicate that numerous groups, with many different cultural traditions, are closely related to the ancient individual in question?

In this particular case, the scientists sidestepped all of these issues and consulted with the local groups in Montana instead. In other words, they let geographic proximity guide the consultation process, rather than genetic relatedness.

As with the first case study, this example shows that DNA could be a double-edged sword when it comes to repatriation issues. In some cases, ancient DNA can help identify lineal descendants or related peoples, and it could facilitate the repatriation of some ancestral remains that were previously deemed to be culturally unaffiliated. In other cases, though, ancient DNA analyses may yield unexpected findings that have the potential to complicate the consultation and repatriation process. We therefore need to think carefully about how (and even if) we

want DNA to be used to support or adjudicate repatriation claims.

Subsequently, these case studies show that there can be both benefits and risks that come with using ancient DNA to infer cultural affiliation and substantiate repatriation and land claims. I want to now return to the three questions I posed earlier. First, what do—and don't—ancient DNA studies tell us about ancestor-descendant relationships, identity, and shared culture? I think ancient DNA can readily identify genetic *relatedness* between ancient and contemporary individuals, but it can be more difficult to establish *direct ancestor-descendant* relationships with any certainty. In many cases, we would need a lot more genetic data than we currently have, including more sequence data from across the genome, broader geographic sampling, and denser temporal sampling. Furthermore, we need to remember that DNA does not tell us an individual's identity or cultural affiliation. Human genetic variation does not map precisely onto the social and cultural groupings in human society, and there is not a clear-cut link between a person's genetic makeup and their identity. Most genetic variants are found in multiple cultural and linguistic groups, so genetic similarity is not always a good proxy for shared culture.

The second question I asked was, "what are the implications and consequences for Indigenous peoples if we rely on genetics to establish these connections, and if we use DNA data to substantiate repatriation and land claims?" In

some cases, DNA can clearly help identify lineal descendants or related peoples, and thus may support some land claims and repatriation requests. However, DNA also has the potential to yield unexpected results that could complicate some claims. Indigenous communities, researchers, and policy advisors therefore need to think carefully about whether ancient DNA should inform the decision-making process in these contexts.

More broadly, we also need to consider the potential consequences of using genetics to answer questions that have previously been decided based on legal, political, cultural, and historical considerations. If we use genetic information to infer the cultural identities and affiliations of people who lived long ago, does that mean we should use the same kind of information to determine the cultural identity or tribal enrollment status of contemporary people? I think this would be highly problematic since we know DNA is not a good proxy for culture or nationality, but this is something that needs to be considered.

Finally, I asked if there are trade-offs to using genetics in this way, particularly if there are short-term benefits but long-term drawbacks. I think this is very much a possibility. What may be expedient or useful in one context may have unintended consequences at other times or for other groups. However, I do think that we may be able to minimize potential risks if we use knowledge of human genetic diversity patterns and Indigenous knowledge to contextualize and

interpret data from ancient DNA studies. If for example, multiple groups shows genetic affinity to an ancient individual but only one group has a history of living in that location, then we may wish to privilege the claims of that group and recognize that the genetic affinities of the other groups may not indicate a close cultural connection.

Thus, if we ground claims about genetic relatedness and identity in Indigenous knowledge and what we know about the genetic patterns of human diversity, we should be better able to use genetic information to benefit Indigenous communities and other stakeholders.

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Lives in Motion: Cautionary Notes on Using Human Biology to Infer Identity, Cultural Affiliation, and Ancestry

ALAN GOODMAN

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-goodman

Good afternoon everybody. It is a pleasure to be here and to follow two excellent speakers. I am a past President of the American Anthropological Association and a former member of the Native American Graves Protection and Repatriation Act (NAGPRA) National Review Committee. I'm also a biological anthropologist and an Ashkenazi Jew from Massachusetts whose four grandparents fled the pogroms in Russia/Poland and arrived in the United States about one hundred years ago.

My main interest is the intersections of culture and biology. More specifically, I investigate how biology shifts through time and the implications this has for biology as well as the use of biology in the interpretation of cultural categories, including identity, cultural affiliation, and ancestry.

So why think about the links between culture and biology? What's relevant about them? We usually think about culture and biology as separate categories, but I want to propose an alternative way of thinking: biology is not a separate sphere from culture. Rather, it is a cultural category that we employ. This is in strong disagreement with Franz Boas who in the early 1900s

did his best to separate culture from biology in order to fight racism. (Boas, in his time, had a hard time thinking about human biological variation as different from race.) Fighting racism is obviously important, but I think that biology is something that we can and need to see from a cultural lens.

To clarify, biology does not equate with genetics even though these terms are often used synonymously, a practice I find problematic. The reduction of biology to genetics is common in the popular press and even amongst some scientists. In reality, the interaction between genetics and culture co-creates human biology. Therefore, I think it's more useful to see biology as an entity created at the intersection of genetics and cultural processes.

Why is it important to understand the ways in which culture and biology interact? I've spent time in Mexico investigating undernutrition and biological wellbeing. When doing so, it is impossible to ignore the role of cultural processes in creating these biological conditions. It's apparent that political and economic processes, such as racism and inequality, can get under the skin.

Today, I'd like us to re-imagine how our cultural "readings" of phenotypes are made to seem real and valorized in the age of genetics.

The title of this talk is about motion and movement: everything is moving, literally. What are the implications of constant motion for identities, biologies, and ecologies? Everything changes and gets mixed up. This can make interpretations of identities particularly challenging, as highlighted by Deborah Bolnick's discussion of the Anzick-1 child and the complications that arise over 10,000 years of human interaction.

Even biologies such as skull shapes change. This is important to consider, as skull shape is often the most common archaeological indicator of biocultural continuity. While we're surrounded by rapidly developing genomic technology, I'm going to take a step back and review what we can purportedly learn from skull shapes and phenotypes. Understanding the methodological basis behind this approach is incredibly important given the racist history of craniometrics. Phenotypes and skull shapes complicate conversations about what race is and is not, and subsequent inferences about continuity, ancestry, and identities.

The structure of human genetic variation has often been apportioned according to the different so-called races: African, Asian, and European. Study after study finds that most all variation occurs within so called races. Native

Americans were often left out of these studies such as the one presented here by Yu *et al.* (2002). That study shows something even more interesting about population genetics: genetic variation is even greater in African populations than in European or Asian populations. Moreover, European and Asian variation is basically a subset of African genetic variation. What does this mean for our interpretations of race? The take-away message is that humans are constantly mixing and interacting with each other, and thus, the little genetic variation that is present is also largely superficial.

The question of “race” is still present in NAGPRA legislation because repatriation work depends to some degree on quasi-racial categories. We struggle to acknowledge that race may not be real in the historical typological sense, but continue to question whether we can identify individuals by race based on DNA differences. This still happens in forensic biology due to its reliance on skull sizes and shapes. It’s not infrequent to pick up a textbook today that will include a “typical” Caucasoid, Mongoloid, and Negroid skull. The question then becomes, “Is it possible to identify races based on skull shape?” The answer according to many forensic anthropologists and skeletal biologists is yes, and very well.

However, I want to test this assumption by assessing the reliability of forensic racial identification based on skull shapes and sizes. In popular and scientific opinion it is believed you can identify race from skulls with 85-90% accuracy.

According to Stan Rhine (1998: 95), the Giles and Elliot method (which I’ll come back to in a second) is “greatly admired” and Alice Brues says that it is the “standard method” for racial identification based on skull shape (1992: 125). Another example of race-based identification comes from Kåathy Reichs, author of the forensic detective novel *Death Du Jour*. The quote from her book says, “I took a breath. The bones don’t lie...from the moment I looked at Elisabeth’s skull, I knew she was a person of mixed race.” According to Reichs, it’s not only simple to identify an individual’s race from their skull, but it’s possible to tell if the person is of mixed race.

The recent development of skull measurement software claiming to determine race and gender received a significant amount of attention. What I’d like to do is test the accuracy and reliability of craniometric identification of “race” by focusing on the test developed by Giles and Elliot (1962), the only such method that has been retested. Giles and Elliot used the method of discriminate functions at a time when computers were just being developed to crunch the data.

The Giles and Elliot method is a multivariate function that includes 7–8 measurements that best discriminate between different “racial” groups. The Giles and Elliot method has several important requirements: all calculations are based on a complete skull; no sub-adults; no Asians; no Latino/Latinas; the test must be conducted after sex is assigned; and it

requires yield of best function. It’s the most common and most tested method and is considered the gold standard for forensic identification based on crania. For example, there are a number of equations developed to make bivariate splits by sex between any two racial groups. The Giles and Elliot method is comprised of a fairly simple equation that requires plugging the cranial measurements into the formula in order to produce a final number. If that number is above 89.27, the cranium is assumed to be Negro. If it is below 89.27, it is assumed to be Caucasian.

When the best-fit calculation was performed the test results were really good. In the original study, 94% of individuals were correctly categorized into their socially defined races. They also kept a sample of skulls from the original test in order to retest the method. Somewhat surprisingly, the percentage of individuals correctly identified dropped to 81.7%. The drop from 94% to 81.7% might have been a little suspicious, but the real surprise was to follow. Other researchers tested the “correct race” identified in four independent retests. The results drop from 94%, to 81.7%, to 59%, to three further studies that were less than 33% accurate.

How do forensic anthropologists respond to the results? First, a lot of people have simply ignored the study while others have pointed out that regardless of the results, the FBI requires forensic racial identification. But that’s not science! Others say that the samples were inadequate. But perhaps

a more important point is that samples are always site and time specific. The discriminate function method is old and inadequate, but the problems plaguing the discriminate function method are still present and can be traced back to the complicated nature of human variation and movement.

Next, I'd like to consider the case of Kennewick Man, or the Ancient One, and what it reveals about skull shapes and phenotypes. In 2014, Douglas Owsley and Richard Jantz published a massive coffee table-sized book titled, *Kennewick Man: The Scientific Investigation of an Ancient American Skeleton*, that detailed the numerous scientific studies conducted on Kennewick, including craniometric analyses. For the past twenty years, Doug Owsley and his co-authors have been holding on to the idea that Kennewick Man is not a Native American because his canonical correlation analysis does not look similar to that of any other contemporary individuals. If anything, the results are similar to populations from Polynesian. However, the values for Polynesian populations are not statistically different from those for Native North Americans. For me, the main point is that Kennewick Man is over 9,000 years old and we should not expect his cranium to look exactly like that of modern Indigenous peoples.

What conclusions can we draw from this discussion? Phenotypes may or may not provide a good window into ancestry and affiliation. Therefore, one has to think critically about context and how phenotypes are being used and

interpreted. What is fascinating are the dynamics of movement and migration before and after AD 1492. Within this continent it is amazing to see the movement of goods and ideas across time and space.

Another important conclusion is that we should not expect the Ancient One to look like present-day populations because boundaries are fuzzy, changing, and genetic variation greatly overlaps.

A really important point here is that prior to the 2010–2011 revision of NAGPRA legislation, 87% or 115,000 individuals were deemed to be culturally unaffiliated. These individuals are from Middle Mississippian cultures and other known Native American cultures but they couldn't be repatriated under the law because they were unable to demonstrate direct lineage affiliation. We know these individuals are Native American despite what NAGPRA states, so I'm calling them false negatives. We know who they are; we just need to have a law that supports their repatriation. If we are using biology, then we need to lower the bar of expected similarity between ancient and modern peoples and we need to use phenotypes (and genetics) with caution because they are not fixed.

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THEME 2

Biogenetics, Justice, and the Repatriation of Human Remains

As techniques for the extraction and analysis of ancient human DNA become increasingly advanced, new uses for this information are becoming apparent. One such proposed use for genetic information is to facilitate the repatriation of ancient human remains. The second symposium session, “Biogenetics, Justice, and the Repatriation of Human Remains,” explores the realities and feasibility of using ancient DNA to identify genetic relatedness between ancient and modern peoples with the intent of repatriating ancestral remains. Referencing case studies and examples from Canada, United States, and Australia, Daryl Pullman (Memorial University of Newfoundland), Dorothy Lippert (Repatriation Office, Smithsonian Institution), and Cressida Fforde (Australian National University) consider these questions from an international perspective.

Drawing primarily from a recent case from Newfoundland and Lab-

rador, Canada, regarding the repatriation of Beothuk remains (Indigenous peoples of Newfoundland, now believed to be extinct), Daryl Pullman explores differing notions of identity (e.g., genetic, cultural, and otherwise), as well as various conceptions of “justice” ranging from distributive, to compensatory, to retributive, and restorative justice. As Pullman explains, how we define justice has implications for repatriation, tribal identity, and land claims.

In the United States, the Smithsonian National Museum of Natural History repatriates human remains, funerary objects, sacred objects, and objects of cultural patrimony to federally-recognized tribes. As Dorothy Lippert explains in her presentation, documenting the ties between existing tribes and ancient peoples can utilize biological constructions of identity, but there are limits to this type of analysis. Particularly problematic is the fact that tribes are political entities

as well as cultural ones, and thus cannot be defined solely based on genetic or biological criteria. Lippert points to several case studies to show how difficult and impractical repatriation would be if it only relied on genetic constructions of identity and affiliation.

Meanwhile, in Australia DNA research has yet to be used for the purposes of repatriating Indigenous ancestral remains but discussions are beginning. According to Cressida Fforde, the potential—if any—of genetic information to facilitate repatriation can be found in cases where there is little to no provenance information available within archival sources. Fforde considers the use of “biological” markers of identity in repatriation to illuminate perceptions of Indigenous identity, the need for greater sophistication in research translation, and the implications (both real and potential) if greater understanding is not achieved and communicated.

Genetics, Identity, and Justice

DARYL PULLMAN

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-pullman

In this presentation I will discuss the ambiguity of identity and differing conceptions of justice. I will give a brief review of some of the events surrounding the Beothuk in Newfoundland and will examine some ethical tensions in the repatriation debate, particularly as it relates to the Beothuk. I conclude with some tentative conclusions about how we might move forward in this regard.

As we've already seen from the talks this afternoon, identity is complex, it's ambiguous, and it's fickle because you can decide to identify differently in one context versus another. Think of the Toronto Blue Jays baseball team and how they've suddenly become "Canada's Team." But they're still the *Toronto* Blue Jays. If you don't live in Toronto and you're Canadian, there's a sort of disdain for Toronto, an anti-Toronto sentiment. Although this doesn't seem to apply when it comes to the Toronto Blue Jays, especially when they're winning!

Our identity is comprised of many different components, of which I list only a few here: cultural, communal, ethnic, spiritual, genetic, professional, and national. All of these interweave to create our

own personal identity that shifts at different times, in different contexts, and depending on the purpose for which we appeal to our "identity."

Justice is also complex and ambiguous, and how we think about it can vary with context. The famous statue of Justice is of a woman who is blindfolded, indicating that justice is supposed to be impartial. Lady Justice holds a weight and balance to show that justice involves weighing competing claims and interests. She carries a sword, indicating that sometimes justice has to take measures to put things right. Finally, she's got her foot on the head of a snake, a symbol of wisdom.

The formal principle of justice is simply "to each as she or he deserves." That's what justice is about: giving people what they deserve. However, this raises the important question of how to determine what each person (or group) deserves? This brings us to various material principles of justice.

There are in fact many different senses of justice depending on the social issue and context. In the legal system we often talk about *retributive justice*, which involves punishing those appropriately if they've transgressed the law. In society in general, we talk about *distributive justice*, which involves

fairly allocating the benefits and burdens that come about from living together in society. A just tax system, for example, ostensibly shifts some of the wealth from the rich to help the poor? That's part of what distributive justice is all about. In other contexts we may talk of *compensatory justice* to ensure that those who have been wronged are properly (and fairly) compensated? Lately there has been much talk about *restorative justice* and how we can address the social and economic imbalance for cultural groups that have been offended in the past. Thus, depending on the context and the question, the type of justice that we're invoking may be different. The type of justice to which we appeal could have implications for our discussions about genetics and identity. Whether our interest is primarily retributive, compensatory, or restorative justice could have significant implications for how we address the issues related to genetics, identity, and justice.

The role and significance of DNA in establishing identity varies with the issue at hand (e.g., land claims, tribal identity, or repatriation) and with the nature of the justice claim invoked. In terms of justice and repatriation, the philosopher, Geoffrey Scarre (2009:72), has said that "of all the forms of cultural appropriation practice in the last century or two, it would be hard to think of

any that has caused greater pain or offense to subaltern communities than the removal and retention of their human physical remains for purposes of study or exhibition.” I want to talk now about the remains of two particular Beothuk individuals and the issues of justice involved in this case.

Many Canadians living outside of Newfoundland aren’t aware of who the Beothuk were. The Beothuk were a Native group that inhabited the island of Newfoundland and became extinct in the 19th century, largely because of the way they were mistreated and eventually exterminated by the colonizers at the time. The definitive book on the history and ethnography of the Beothuk is that written by anthropologist Ingeborg Marshall (1998). She notes that the Beothuk woman named Shawnadithit who died in the early 1800s is supposedly “the last of the Beothuk.”

This is an image of a statue of Shawnadithit that was commissioned recently by the government of Newfoundland. It is part of the Newfoundland community’s attempts to acknowledge the wrongs that have been done and to make reparations.

In a proclamation made in 1769. Governor John Byron, the King of England’s representative in Newfoundland, addressed the issue of the poor treatment of the Beothuk people by the settlers. The proclamation states in part:

Whereas it has been represented to the King, that the subjects



residing in the said Island of Newfoundland, instead of cultivating such a friendly intercourse with the savages inhabiting that island.... do treat the said savages with the greatest inhumanity, and frequently destroy them without the least provocation or remorse. In order, therefore, to put a stop to such inhuman barbarity, and that the perpetrators of such atrocities may be brought to due punishment, it is His Majesty’s royal will and pleasure that I do express his abhorrence of such inhuman barbarity, and I do strictly enjoin and require all his Majesty’s subjects to live in amity and brotherly kindness with the native savages of the said Island of Newfoundland (cited in Marshall 1998: 92-93).

Apparently the Beothuk were unlike other groups, many of whom set up trade agreements with the colonizers and stuck up relationships. Instead, the Beothuk were a very solitary people who didn’t want to engage in such relation-

Figure 2. Gerald Squires’ statue, “The Spirit of the Beothuk”, memorializes Shawnadithit and the Beothuk. Photo Credit: CBC (<http://bit.ly/1teC2Ue>)

ships. There was also a lot of animosity because the Beothuk would rob the settlers’ traps. It wasn’t unheard of for the settlers to kill Beothuk upon sight. This is all part of the historical context for the royal proclamation.

What I want to focus on today are two Beothuk individuals who are very well known in Newfoundland history. Here I refer to the story of Nonosbawsut and Demasduit. Nonosbawsut was the Chief of the last known Beothuk tribe and his wife was Demasduit. In March of 1819, there was a confrontation between this small group of Beothuk and some settlers. Nonosbawsut was killed and his wife was taken captive. The idea was that the settlers wanted to capture a Beothuk who would serve as an emissary and help to build relations with the Beothuk. It was a rather poor start and didn’t end

very well since Demasduit contracted tuberculosis and died nine months after her capture. After her death the settlers returned Demasduit's body to the site where she had been captured. There they found a burial hut that included the remains of her husband, Nonosbawsut. Apparently the Beothuk had come back after he'd been killed and placed his body in this burial hut. There were other bodies in the funeral hut, including both an infant thought to be the son of Nonosbawsut and Demasduit who had apparently died within weeks of his mother being taken from him. The bodies of Nonosbawsut, Demasduit, and their son were laid to rest together in the burial hut.

Seven years later, William Cormack (founder of the Beothuk Institution¹) set out to build positive relationships with the Beothuk and to learn if there were any more Beothuk living in the province. Although he was unsuccessful in his search, he did return to the burial hut from which he took the skulls of Nonosbawsut and Demasduit and shipped them to his mentor at the University of Edinburgh. The skulls of these two rather famous people in Newfoundland history remain, to this day, in the Royal Scotland Museum of Edinburgh.

Every Newfoundland child growing up in the school system learns about the Beothuk. There's a sense of remorse and guilt that our

Newfoundland ancestors wiped out this Native population a couple hundred years ago. Everybody knows the story of Nonosbawsut and Demasduit and knows that their skulls aren't here in the province. For whatever reason, even for non-Natives there's a certain sense of proprietorship and loss about these skulls. Additionally, this story has made its way into popular fiction. The well-known book, *River Thieves*, by Newfoundland author, Michael Crummey (2002), is a work of fiction but he builds his story around the historical figures of Nonosbawsut and Demasduit. Their story is very much a part of Newfoundland culture and history.

There's been effort on behalf of some to repatriate Beothuk remains. Aside from the skulls in Scotland, Memorial University has the remains of 12 individuals, and another ten Beothuk individuals are in the Canadian Museum of History.² But as the Director of Archaeology at the Canadian Museum of Civilization says, "We just don't have the resources to be proactive on repatriation. We have to respond to requests as they come to us." And of course, the request has to come from a community representative who can demonstrate a link to the human remains. But, who speaks for the Beothuk if their tribe is indeed extinct?

In the United States under NAG-PRA there are new rules that give tribes authority to claim "unaffiliated remains" that cannot be linked to an existing people.

However, we don't have any similar legislation in Canada. In fact, the Canadian Museum of History goes through a somewhat quasi-legal process where they set their own rules. Under these rules, they seek to honour existing treaties and require that requests for repatriation come from "an Aboriginal government of individuals establishing a demonstrable link to the materials." This is problematic in the case of extinct peoples and is especially difficult when some remains, such as the skulls of Nonosbawsut and Demasduit, reside in a foreign jurisdiction.

Chief Misel Joe of the Mi'qmaq band, the only Native band on the island of Newfoundland, says that repatriation is just the right thing to do. He's appealing to restorative and perhaps compensatory justice when he talks about repatriation being the "right thing to do."³ However, Ingeborg Marshall, the main scholar on the Beothuk, is completely opposed to repatriation and cites claims of distributive justice, although she doesn't use that term (2008). She says that justice demands that we maintain these materials for all of humanity because we all have a claim on the historical record and an interest in what we could potentially find out.

That's not an uncommon theme among archaeologists and anthropologists. Phillip Walker, a well-known bioarchaeologist, says that "human skeletal remains are a unique source of information on the genetic and physiological re-

1. This was established in 1827 to "to open a communication with "the Red Indians of Newfoundland," to promote their civilization, and to procure an authentic history of this native group." <http://bit.ly/1TLUNoV>

2. Until 2012 this was the Canadian Museum of Civilization.

3. Calls made to repatriate Beothuk remains, CBC News, June 23, 2012: <http://bit.ly/286p4s2>

sponses *our* ancestors made to the challenges posed by past natural and socioeconomic environments. Consequently, they provide an extremely valuable adaptive perspective on the history of our species” (2007: 13, emphases added). He goes on to say that “as caretakers of this fundamental source of information on the biological history of our species, we need to promote the long-term preservation of skeletal collections and in this way ensure that future generations will have the opportunity to learn from them and in this way know about and understand that history” (p. 24). There’s a claim about justice here for us, but also for future generations as well. If we rebury all of these remains it will end the history, so to speak.

The skulls of Nonosbawsut and Demasduit have been studied using ancient DNA techniques (Kuch *et al.* 2007). The local Mi’kmaq say that they’re related to the Beothuk, but it’s still ambiguous as to whether there is any sort of genetic connection between the two. A more recent genetic study by Ebenesersdóttir *et al.* (2010) suggested a potential genetic connection between people in Iceland with certain Native American communities. For example, one headline proclaimed that a “group of Icelanders may carry Beothuk genes.”⁴

When the Vikings came to North America over a thousand years ago, they landed in northern Newfoundland. It is suggested that the Vikings may have captured what

they call “skraelings” and brought them back to Iceland. If we continue far enough down the path that genetic identity should somehow confer the right to have a claim over the remains of the Beothuk, then we might have an odd situation where there are people in Iceland who have more of a claim over the bones of Nonosbawsut and Demasduit than do other individuals who now live in Newfoundland.

Can we reach a compromise? As far as the extinction of the Beothuk is concerned, repatriation of all remains could effectively curtail future investigations of the Beothuk past and their relations to other peoples, past, present, and future. However, many Aboriginal representatives acknowledge that there is room for negotiation with regard to repatriation and reburial. Even Chief Misel Joe says, “We’re not against science, but these bones have been studied enough and we have to do something.” Willie Ermine, a Native scholar, talks in his work about an “ethical lodge,” which refers to the space between Native and Western cultures (Ermine 2007). This space can be opened up to allow for dialogue and potential compromises around competing values, such as those related to the question of whether or not to repatriate Beothuk remains, and those of Nonosbawsut and Demasduit in particular.

I finish by offering some tentative conclusions about the skulls of Nonosbawsut and Demasduit. I believe that the federal and provincial governments should be involved in making a formal appeal to the

government of Scotland for repatriating the skulls of Nonosbawsut and Demasduit. They should be returned to local Indigenous representatives—irrespective of any genetic identity. The fact of the matter is that many Indigenous peoples suffered at the hands of colonizers. Thus, to some degree First Nations peoples in Canada share a similar lived history and identity irrespective of genetic connections. Furthermore, a process needs to be set up for negotiation with regards to the disposition of the remaining Beothuk skeletons—an “ethical lodge”—that gives due weight to continuing scientific interests, acknowledges the historical injustices endured by all Indigenous people (past and present), and gives due respect to cultural values.

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4. Alan Parker, Descendants of Newfoundland's “extinct” Beothuk live on in Iceland, *Toronto-Sun.com*, July 19, 2011: <http://bit.ly/1VzMjFV>

Repatriation and the Limits of Genetic Identity

DOROTHY LIPPERT

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-lippert

Hello everyone, I'm Dorothy Lippert. I'm Choctaw and a Case Officer for the Repatriation Office at the Smithsonian's National Museum of Natural History. I should note that what I'm presenting today are my own opinions and do not represent those of the Repatriation Office or the National Museum of Natural History at the Smithsonian Institution. I would like to acknowledge the traditional owners of the land here in Vancouver and to thank you for the wonderful welcome to this place. It's very nice to be here.

Today I would like to speak about the intersection of DNA analysis and repatriation. What we've seen in the last ten years is an increase in the number of queries about the use of DNA for repatriation. People often think that DNA may help us solve cases more quickly or to a higher degree of certainty than we currently do. I believe that there may be a place for genetic analysis but it does not easily suit our needs at the present time. The Repatriation Office at the National Museum of Natural History was established in 1989 by the National Museum of the American Indian Act. The act compels the Smithsonian Institution to evaluate its collection of human

remains and funerary objects and upon request from a culturally affiliated and federally recognized tribe, return the objects to the tribe. Just to note, the Smithsonian is separate from NAGPRA and our mandate, under the American Indian Act, was passed in 1989, earlier than NAGPRA. You can find out more on our website: <http://anthropology.si.edu/repatriation>.

Amendments to the National Museum of the American Indian Act were passed in 1996 that direct the Smithsonian to consider the repatriation of funeral objects, sacred objects, and objects of cultural patrimony, which puts us on the same footing as NAGPRA. Thus, the Smithsonian was exempt from NAGPRA but not from repatriation. Upon receipt of a request from a federally recognized tribe, our office begins to construct a set of recommendations for the museum. We work based on requests from federally recognized tribes who must contact us first. Once they decide that they want to pursue repatriation, we then go to work evaluating whether or not we are legally permitted to follow through with the repatriation.

The set of recommendations produced by the Repatriation Office contain an assessment of the cultural affiliation of the human remains and objects. For the sacred objects and objects of cultural

patrimony, we also have to consider whether these objects fit the definition provided in the National Museum of the American Indian Act. A standard requirement for repatriation is to find cultural affiliation between the tribe making a request and the community from which the remains or objects derive. This is defined as a determination of a relationship of shared group identity between an earlier identifiable group and an existing federally recognized tribe.

Establishing this relationship relies on understanding both the past and present groups. The tools used for establishing past identity are listed in the repatriation laws. A group may be identified using historical, archaeological, biological, geographical, or anthropological evidence, and tribal oral history may also be considered. While the geographic boundaries between existing federally recognized tribes are for the most part clear, boundaries defining past groups are indistinct, subjective, and embedded within a web of authority. This fact often goes unnoticed by people working in archaeology who may cling to a self-ascribed mantle of objective authority.

Present-day archaeologists using present-day theory and method define the identities of past groups. For example, the political nature of the Mississippian Pe-

riod communities in the American Southeast is still being debated. For example, do the mound sites in and around the Macon Plateau in Georgia relate to a single group or to multiple groups with different identities? Did the apparent differences in language and dialect by communities visited by the De Soto expedition of 1540 represent distinct polities? Or did they perceive of themselves as a greater whole?

These questions of identity turn on the information from archaeological sites and on ever shifting theories of the Mississippian Period political organization. While these questions are useful and enjoyable ones for archaeologists to consider, these theories take on greater significance when they are used to establish cultural affiliation for repatriation purposes. Identifying a site as culturally affiliated gives an extant tribe rights to the disposition of human remains and objects from that site.

Yet given the nature of archaeology as a science, the interpretation of evidence cannot remain static. Does this mean that the identity of specific individuals buried at a site shifts as present-day thinking shifts? Logically, it doesn't, but practically speaking it does. This is because an archaeologist assessing the cultural affiliation of one of these sites relies on the existing theory and available evidence to determine a relationship. Thus, new evidence could shift the affiliation.

There's also the issue of federal recognition. Until 1978, the government recognized Native American

tribes in the United States on an ad hoc basis. Tribes could gain recognition through treaties or administrative decisions by the executive branch, or through court decisions. The federal acknowledgement process established by the Bureau of Indian Affairs went into effect in 1978 and is administered by the Office of Federal Recognition.

As a result, there are now seven criteria that a tribe must meet in order to receive recognition:

- 1) The petitioner has been identified as an American Indian entity on a substantially continuous basis since 1900;
- 2) A predominant portion of the petitioning group comprises a distinct community and has existed as a community from historical times until the present;
- 3) The petitioner has maintained political influence or authority over its members and an autonomous entity from historical times until the present;
- 4) The petitioner must provide a copy of the group's present governing documents;
- 5) The petitioner's membership consists of individuals who descend from a historical Indian tribe or from historical Indian tribes that combined and functioned as a single autonomous political entity;
- 6) Membership of the petitioning group is composed principally of persons who are not members of any other acknowledged group; and
- 7) Neither the petitioner nor its

members are the subject of congressional legislation that has expressly terminated or forbidden the federal relationship

Currently, there are 556 federally recognized tribes in the United States, but there are many more who have applications pending with the BIA. Among those is a tribe in Virginia that lacks recognition due to a set of strange historical events. I should note that there was another tribe in Virginia that was recommended for recognition back in July, but at the last minute, the Bureau received letters questioning whether they had the right to be affiliated, so that affiliation is on hold. To date, there are no federally recognized tribes in Virginia.

Between 1912 and 1946, Walter Ashby Plecker served as the Registrar of Vital Records in the state of Virginia. An ardent white supremacist, Plecker drafted the Racial Integrity Act in 1924. It mandated that a person with African ancestry, no matter how small, would be classified as "coloured." Plecker believed that intermarriage between the Virginia tribes and other groups meant that the tribes were no longer pure and that many people of African descent were classifying themselves as "Indian" in order to escape restrictive laws and social practices. Plecker mandated that Indians be classified as coloured and even went so far as to re-classify Indian families by changing their vital records to identify as coloured. He actually went back and changed people's birth certificates who, when they were born, identified as Indian but he altered them after the fact.

This has resulted in the inability of the Virginia tribes to achieve federal recognition based on the first criteria: “that the petitioner has been identified as an American Indian entity on a substantially continuous basis since 1900.” While not recognized by the United States Government, the tribes maintain distinct cultural identities and political practices. Since 1677, the Pamunkey and Mattaponi Tribes have been paying a tribute originally to the English Governor of the colony, and later the United States Governor of Virginia. In addition, they’ve continued to be recognized by the English crown. In essence, the identity of the Virginia Indians, according to the United States, rests on a set of insurmountable requirements that result from historical inequities. According to the tribes themselves, they remain what they’ve always been: Virginia Indians.

When it comes to repatriation, however, these tribes cannot be considered for cultural affiliation. Although a relationship can be identified between some of the Virginia tribes and human remains in the collections of the National Museum of Natural History, the lack of federal recognition prohibits repatriation according to the museum’s guidelines and procedures. The Repatriation Office does not address requests from tribes that are not culturally affiliated. Although repatriation likely will not happen until a tribe is federally recognized, the museum facilitates visits by tribal members so they can be with their ancestors. In

2005, I hosted a visit by members of the Cheroenhaka Nottoway tribe of Virginia. The visit is proudly documented on their website¹ complete with photos of them with the remains, which is why I haven’t included any here. We discussed repatriation issues and they lectured us about tribal history. When they visited the remains of their ancestors, the mood was somber yet resolute. The Nottoway knew they were related to those individuals. The museum had said they were related, but at that point, all they could do was visit their ancestors and cry and promise that they would work to have them returned.

It’s encouraging to know that even though a formal repatriation cannot take place, the return can be achieved with the assistance of a federally recognized tribe. For example, in a case where we were able to find cultural affiliation with a U.S. tribe for sacred items that had been taken from a tribe across the border in Canada, once we turned the items over to them, they promptly turned the items over to their relatives in Canada. Additionally, we often consult with unrecognized tribes and arrange visits for members of those communities so that prayers and blessings can be made.

Much of what fuelled Plecker’s crusade against registration of those born in Virginia as Indian was his

1. Cheroenhaka Indian Tribe reconnects with remains of ancestors removed by 1960s archaeological dig, *Tidewater News*, December 1, 2005: <http://bit.ly/1P8w3Fe>

adherence to the “one drop rule.” This refers to the belief that one drop of African blood makes a person “negro.” If this was applied to Indian tribes, it would mean that a person with Indigenous ancestry would be expected to identify as a Native person regardless of their cultural experience. For some tribes, the formal requirements for enrolment do reduce genealogy to metrics, and include or exclude individuals based on blood quantum. I’m grateful to Dr. TallBear for discussing these issues in a recent paper, so I won’t delve into it any further here.

On the other hand, there are many people who identify as Native American based on family stories. As former U.S. Senator Ben Nighthorse Campbell once quipped, “there were plenty of people who weren’t Indian until they saw ‘Dances with Wolves.’” And as Armand Minthorn noted earlier today, most of these people seem to have Cherokee ancestry. It’s common for many of these people to say that they have ancestry but they don’t say that they are Cherokee. But in fact, if they have that mythical Cherokee grandmother, they might be able to enroll in the Cherokee Nation because the nation requires that members trace their ancestry back to the Dawes Rolls², which were

2. As noted on the Oklahoma Historical Society website: “Officially known as The Final Rolls of the Citizens and Freedmen of the Five Civilized Tribes in Indian Territory, the Dawes Rolls list individuals who applied and were approved for membership in the Five Civilized Tribes (Cherokee, Chickasaw, Choctaw, Creek, and Seminole). Enrollment for the Dawes Rolls began in 1898 and ended in 1906.” Source: www.okhistory.org/research/dawes

made during the dissolution of Indian lands in Oklahoma during the late 19th century. It's almost as if these people don't realize there's a difference between being genetically related to a tribe and actually being a tribal member.

In repatriation, drawing a link between the past and the present is often the work of archaeologists. Both of the repatriation laws direct institutions to consult with tribes but the degree to which this has happened varies. Generally, findings of cultural affiliation rest on the decisions made by museum workers, which are based on archaeological and anthropological theories and practices that evolved in the absence of input from Native Americans. Archaeologists who work in repatriation often do not acknowledge the deep roots of their determination of cultural affiliation, nor do they understand that tribal practices in the past may be mirrored by the present.

One case I worked on involved an individual listed, confusingly, in the medical records as "cranium from Fort Washita," which was in Oklahoma. It had the name of a tribe and a blank space for the nation. In 1852, a U.S. army surgeon sent these remains to the Smithsonian Institution directly from the fort. The cranium was accessioned into the mammal collection as "Indian Cranium" and the logbook gives no indication as to the tribal origins. The cranium was transferred to the Army Medical Museum, Washington, DC, in 1869. Its record reads only "cranium of [tribal nation]" and "calvarium of [tribal name] Indian," along with the catalogue

number. When the remains were transferred to the National Museum of Natural History in 1904, the catalogue listed them as "Indians [tribal name]?"

The facial morphology of the remains, along with an anatomical variant on the cranium called *os japonicum*, suggested that the individual may have been of African American ancestry. Craniometric investigation of this individual revealed that this person classified morphologically as African American, using reference groups composed of early 18th- and 19th-century African Americans, European settlers, and Southeastern Native American. I discussed this individual with the tribe as they had included her in their repatriation request. We talked about their historical background of relating to African Americans. The final finding by the museum was that we did not have enough evidence of cultural affiliation to repatriate her. When I talked about it with the tribe, they said that they had figured that might be the case but that they wanted to make the claim in case there was no other way for this person to be buried.

This tribe had a history of enrolling African Americans, but they had also in the past kept African Americans enslaved. The tribal identity supported the possibility of including this person whose relationship was undetermined because they wanted to rebury her. Unfortunately, this wasn't possible under U.S. Federal law.

When I was putting together my presentation for today, I thought,

"what would it be like if we used DNA analysis for repatriation?" Aside from such questions as how would we get the funding for this, who's going to do it, do we have lab space and technicians, and et cetera, I was also looking at these cases and thinking for the Nottoway, who are not federally recognized under the law. For them, no matter what the DNA analysis said, we could not repatriate.

For the individual from Fort Washita, the records are not sufficient to allow for repatriation. While we have some historical understanding of what the identity was for African Americans in that tribe, the DNA is not going to speak to that. So what are we to make of genetic identity and its relationship to repatriation? At the present time, the National Museum has no plans to use DNA analysis in repatriation studies, as far as I know. I don't think it's useless; it's just not yet relevant. Currently, our repatriation process is able to repatriate a majority of the remains that we've considered. We think that eventually new technologies may help us to repatriate those individuals that are currently listed as culturally unaffiliated. I think DNA is one of these new technologies, but currently it produces more questions than it answers.

Human remains that are returned go back with a lot of things that they didn't come in with. They are returned with numbers written on their crania, stains from metal objects placed in their graves, stains from metal wires used to replace their articular cartilage when they were used for study. They go back

with identities ascribed to them by archaeologists: “Southern Appalachian,” “Mississippian,” “Natchezian,” and others. They also return with much less than what they were buried with. They mostly lack their names, but they also lack portions of their skeletons and funerary items. If we were to apply DNA testing, they would lack even more of themselves because it is a destructive process. Therefore, if we are to do DNA testing, we must make sure that the scales balance out and that it will help them to regain their identity.

The remains of ancestors were placed in the ground with care and love and they are received back by their communities in the same way. Whatever we do as archaeologists in the repatriation process, it’s vital we do it in the same spirit.

Provenancing Indigenous Human Remains for Repatriation Purposes: A Case Study for Exploring Perceptions of Biological and Social Identity

CRESSIDA FFORDE

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-fforde

Good afternoon everybody. I'd like to begin by acknowledging the traditional owners of this beautiful country in which we're meeting, and to thank you for your welcome. My name is Cressida Fforde, I work at the National Centre for Indigenous Studies at the Australian National University (ANU). We are a small, multi-disciplinary centre and we try as much as possible to be inter-disciplinary, which probably shows in my talk today.

I am involved in three projects at present. The first is about a number of issues surrounding repatriation, such as its effects and transformative opportunities, and its links to wellbeing and community development; the second concerns deficit discourse in Indigenous education; and the third, which is just commencing, considers the impact of genomics on Indigenous identity in Australia. My component of this last project works with two community organizations to have discussions about whether DNA research for repatriation purposes might be of benefit for them in their repatriation programs and, if so, under what conditions.

My main research area and professional practice over the past twenty years or so has been the

repatriation of Indigenous human remains housed by museums and collecting institutions. Within this, probably the most consistent topic of interest has been the history of the concept of race and scientific racism, and in particular how the practice of such "science" gathered data according to pre-conceived notions of hierarchical racial difference and in its protocols of measurement and analysis "mapped" such preconceptions on to the human body. This practice constructed, maintained, and reified racial identities that had little to do with how people viewed themselves, and continues to have lasting impact.

Through my interest in the 19th-century construction of racialised identities I have become interested in what we call deficit discourse. This is a discourse that is very invasive in Australia and consistently understands Aboriginal identity through a lens of deficit. It is not hard to identify *deficit discourse* as a legacy of the race paradigm, nor is it hard to identify it in aspects of genomic research, such as addiction research. A notion introduced by the colonial project, both the settler and Indigenous populations may now engage in deficit discourse. Can such discourse be identified in these early conversations about DNA for repatriation and, if so, how could it be shifted?

Craniology

In the 19th century, scientific interpretation of human remains provided authoritative "truths" about Aboriginal people and influenced how the dominant society perceived and acted towards them. Nineteenth- and early 20th-century scientific analysis of Aboriginal human remains can be seen as

GENETICS refers to the study of heredity, or how genes are passed down from parents to offspring.

GENOME: The genome, whether human, animal, or plant, refers to all of the genetic material present in a single organism.

GENOMICS refers to the study of the structure and function of a genome.

part of the lens through which the European culture viewed Australia's indigenous population. It influenced how Aboriginal people were perceived and valued, yet it in turn was upheld by pre-conceived notions of racial hierarchy. Viewed in this way it can be seen as part of what Attwood (1992) has described as "aboriginalism." Influenced by Edward Said's 1978 work on *Orientalism*, aboriginalism is a mode of discourse that constructs, guides, and constrains European knowledge about the "Aborigines." Discourse is important to consider

in this space, because it speaks to larger social processes in which production of knowledge about people play a part.

The tension between concepts that approach difference as natural or mapped has been discussed by a number of people. How genetic variation is used in some health research, pharmacogenomics, and ancestry determination appears to promulgate or, at best, allow the former concept to resonate more than the latter. At the least, it is exceptionally vulnerable to such representation, leading some to describe it as the “molecularisation of race.”¹

As others today have said, when we focus on biology we turn our gaze away from the social world. The social world—and our identities within it—is highly complex. Identity is not vertical and solely cemented in blood and lineage but is contextual, horizontal, and produced through our relationships with others. Biology plays a part, but it is a part that is much less clear and much less important than most realize.

Repatriation

The repatriation of ancestral remains is an extraordinary Indigenous and cross-cultural achievement of the last 40 years. Repatriation itself has achieved many things beyond the return of ancestral remains and is proving to contribute to such things as healing and wellbeing, and cultural transmission, and is being

incorporated into Indigenous development approaches. Repatriation can be a counter-narrative to deficit discourse because it is all about agency—*Indigenous* agency. In real life, it is all about adaptability, dignity, and innovation by those seeking the return of the remains of their ancestors.

Repatriation is also insightful because it can be a window through which to view underlying assumptions. One such example are the assumptions revealed by retention arguments, and I have been particularly interested in those that engage with identity and notions of authenticity seen through the lens of race and blood quantum. I include within this things like the questioning of Tasmanian Aboriginal claims on the basis of the erroneous belief that Tasmanian Aboriginal people had become “extinct” in the late nineteenth century, or the claim that repatriation demands from Indigenous Australians were purely political in motivation. Such accusations were usually spurred when repatriation requests were delivered by people who might not “look” or “act” like Aboriginal people “should.” Repatriation thus disturbs a discursive space and in doing so can reveal a very constrained biological view of identity and culture when ascribed to Aboriginal people.

The repatriation process can also engage strongly with identity because of the need to determine communities of origin. Perhaps unsurprisingly, given the above observations, repatriation practice can be a bridge to notions of identity based on biology. This can

most easily be identified in the use of craniometrics for determining ancestry in repatriation processes.

Craniometrics

While some archives may record Aboriginal group names or, if lucky, the names of individuals, most provide information in terms of geographical location from which the remains were taken. This information varies in its specificity from listing the entire country of Australia, to exact locations. In Australia, geographical area enables identification of community of origin, with some exceptions such as whether an area is contested or shared. *Place* therefore identifies who has the authority to speak about these remains. In this case, *place* and *social identity* are very aligned. The degree to which *place*, *social identity* and *biological identity* align, may not be so straightforward.

Craniometrics is used in repatriation to assist ancestry determination, meaning whether the remains are Aboriginal or not. This approach is used to try to provide details when no archival information is present, and is part of a suite of evidence when archival information is available. The weight that is given to craniometric results in repatriation is testament to the continuing belief in the veracity of this technique, as well as the continuing dominance of biology as a determinant of identity. This is despite the critique of craniometrics over the last ten years or so, and the quantity of work for decades that has sought to understand our social identity.

1. For a more detailed discussion see Koenig *et al.* 2008.

A focus on craniometrics and biology in repatriation does not appear to engage with the rich sociality of humans, not only in terms of identity but also in terms of how this informs people's views, obligations, and responsibilities towards the deceased. If we roll the "biology ball" along for a bit and follow it to its conclusion—whether we agree with it or not—one inevitable outcome of the comparison of the morphology of ancestral remains in museums with those in a database that are considered *not* to be of mixed ancestry, is that returning the remains of Aboriginal people who do not "match" because they have Aboriginal and non-Aboriginal biological ancestry become questionable. All of this raises the same issues with biological identity as mentioned above, but in a repatriation context. It prompts questions such as: if claimants identify as Aboriginal, do they have less right to the remains of their Aboriginal-identifying grandmother simply because her father was English? Indeed, do they have any less right to their English great grandfather? If these kinds of issues are occurring at the level of the phenotype, will they also have salience at the genotype level?

Is there a future in DNA research for repatriation purposes?

Because of the commendable reservations that Indigenous people have voiced about genetic science, there has been little genomic research undertaken with members of Australia's Indigenous population. This, however, is changing as illustrated by the development of ethical frameworks and community consultation surrounding the use of a blood sample collection

obtained in the 1960s and stored at Australia National University,² by an increase in Aboriginal people testing their own DNA through commercial services such as *23andMe*, by discussions around DNA research in health, and by work on ancient DNA as a means of understanding human migration. All of these have very significant ethical considerations, some of which are being discussed and explored more than others. An additional potential use for genetic testing that has been identified is its use for repatriation purposes in relation to those remains that are poorly provenanced, a topic to which I will return shortly.

First of all, I'd like to consider briefly the way in which genomic science has been reported in the Australian context as a means of understanding its vulnerability to affirm old perceptions. In 2011, Rasmussen et al. published genomic results from a strand of hair given to anthropologist Alfred Cort Haddon in the early 1920s by an Aboriginal man at a train station in Kalgoorlie, Western Australia. Their article, "An Aboriginal Australian Genome Reveals Separate Human Dispersals into Asia," produced information about ancient migration routes into Australia and received

2. The National Centre of Indigenous Genomics, for example, curates a collection of around 7,000 blood samples of Aboriginal people across Northern Australia which were taken in the 1970s as part of a global project investigating human's response to the environment—the Australian hub for this project was ANU. After a period from the 1990s in which a moratorium was placed on the use of this collection because of the clear ethical concerns, and independent Indigenous consultative committee recommended that the ANU set up the Centre which is now undertaking consultation with communities to ascertain their wishes.

much attention in the popular and science media. I was interested to see how the media was going to portray this new discovery and, in particular, Aboriginal people. There were some counter narratives to the usual deficit discourse, such as the "Aboriginal Trailblazers" described by the BBC. However, in all cases in which a visual image accompanied the article, the photo chosen to represent Aboriginal people was that of individuals stereotypically considered to be easily recognizable and "real" Aborigines, meaning familiar shots of dark-skinned people in the desert or conducting traditional ceremonies, not dark-skinned people at a computer or in a cockpit, or fair-skinned Aboriginal people in the desert managing pastoral stations. Nor perhaps most accurately, a young man at railway station in the 1920s.

I should point out that the Goldfield Aboriginal Land Council retrospectively supported the work on the hair strand and considered the research not to have threatened their own views of where they had come from and their longevity in that space. Nonetheless, the representations in the media did little to counter stereotypic notions about Aboriginal identity. These kinds of representations are important today because of the history of the use of race and blood quantum in Australia as a function of control and power, and continuing accusations of inauthenticity and fraudulence, by both Indigenous people and non-Indigenous people—should people not look like their "type." This is part of the legacy of the construction of identity that occurred in last century. The myth

of extinction is an inaccurate claim faced by many groups who continue to fight against such misinformation, whether from government or an ignorant populace.

The ill-ease articulated by Aboriginal people at some of the techniques of genetic science that require measurements, for example, of rates of so-called “admixture” have been documented by Kowal and Anderson (2012). This speaks to a long history and continuing legacy of the role that such perceptions have had on Australia’s Indigenous population, and the continuing salience of “authenticity” as a pejorative term.

DNA, Repatriation, and Provenance
Against this historical and discursive background and the deep reservations that are held by many about any further research being undertaken on remains that have been housed so long in museum—and particularly DNA work because of the destructive sampling required—is there a future for DNA research to assist communities in their repatriation endeavors?

It is important to note also that requests for retention of DNA samples by overseas museums has been met by refusal, most notably in the Tasmanian court case with the Natural History Museum in London.³ It is also important to remember that the future possibili-

ties of DNA research were held up by museums as a reason for retention back in the 1990s. The destructive nature of DNA sampling, the perception that modern DNA questions surrounding migration and human origins were simply an updated version of nineteenth century interest in skull collecting, and the significant problems associated with the human genome diversity project are all reasons why people are extremely wary. However, the research in question here was not, as far as I am aware, for the sole purposes of assisting repatriation.

In Australia, I am not aware that DNA research has yet been used within repatriation practice, but it is certainly on the table. The Indigenous Repatriation Unit of the Australian Government has released an information sheet⁴ for communities about scientific testing to assist people in their deliberations. This sheet notes that scientific testing involves complex ethical and cultural sensitivities and in many cases can raise more questions than it answers. It notes that the need to balance the risks of loss through destructive sampling against the potential benefits of the knowledge gained is one of many difficult decisions Aboriginal and Torres Strait Islander peoples face when considering whether to undertake scientific testing. It also makes clear that as with any research, there is potential for error, misinterpretation, or bias, and also notes in specific reference to DNA research that, “to determine the genetic relationships between

living people and populations of the past, it may be necessary to obtain samples from present day Indigenous peoples for comparison and reference. The ethics of maintaining and protecting these modern samples is a further challenge that needs to be recognized by all stakeholders.”

There are many unanswered questions about what DNA research for repatriation purposes might look like. As noted above, in Australia it is *place* that determines who has the authority to speak. We do not know if it is possible to consistently establish social identity from biological identity using a comparison between ancient DNA and that of people today, but I expect not. We don’t know, for example, whether archive records that establish *place* and DNA testing that establishes *genetic ancestry* would lead to the same result, and neither may be wrong.

The way to consider matters surrounding the repatriation of Indigenous human remains is to return to first principles and to keep a firm eye on what is at the heart of this process: repatriation is about the return of control, or the wresting back of control, and requires acknowledging that Indigenous groups have the right to determine the future of their Ancestor’s remains. So the primary issue for the application of DNA research to repatriation is: Who has the authority to speak and in what context is DNA research being considered? Three hypothetical scenarios help to explore this point.

3. See: a) Aboriginal remains fight resolved, *BBC News*, May 10, 2007:

<http://bbc.in/1t4G8iv>

b) Tasmanian Human Remains – Tasmanian Aboriginal Centre and Natural History Museum London, *Arthemis Art-Law Centre, University of Geneva*: <http://bit.ly/1TM7n7w>

4. “Information for Communities Scientific Testing on Indigenous Ancestral Remains.” Available at: <http://bit.ly/1UiZsOQ>

The first is a scenario in which ancestral remains have been returned to the control of a regional community organization, but only have regional provenance, and that organization is considering ways in which more localized authority to speak for the deceased might be identified. In this case, Indigenous control is clear and a community-driven project is possible. From this can flow a project that is designed by the community organization to suit their cultural protocols and their research translation requirements, utilize their consultation processes, and assert intellectual property conditions and data management requirements on those whom they choose to undertake the research with. This would of course include the significant issues relating to the compilation of a reference collection if none already exists, and extensive and informed discussion about what research results might actually yield.

The second scenario is one in which ancestral remains have been returned to Australia but have not been repatriated to any group because they have only national provenance. Ancestral remains in this category are currently housed at the National Museum of Australia, but this is not a happy solution for people and there have been a number of consultation processes to try to resolve what is a deeply unsatisfactory situation. A recent national consultation process by the Australian Government on the development of a National Keeping Place resulted in broad support for such a location in Canberra. In addition to the need for a resting

place, a place of memorial, grieving and education, there were a variety of views as to why such a keeping place should be set up, including that such a facility would be under Indigenous control, and that it might provide opportunity for further provenancing possibilities in the future. Views were also expressed about the importance of not undertaking any further testing and that remains should be left in peace. In this type of scenario, Indigenous custodians would determine the nature of any protocols surrounding DNA research. As noted in the National Keeping Place Report, “consent by traditional owners to undertake scientific research is paramount. Understanding both the proposed research and the implications of participating in the research from an ethical and scientific view are issues that Aboriginal and Torres Strait Islander peoples face when considering the use of scientific research methods” (Advisory Committee for Indigenous Repatriation 2014: 45).

The third scenario would be the assertion by a retaining institution that DNA testing should be undertaken to prove the connection between the ancestral remains and the claimants, or to establish whether remains are Aboriginal or not. I have not come across this situation but I am sure it has been thought about. Biological connection certainly has been considered by museums as a determinant of standing for claimants in the past, which was interesting in that biological relatedness is certainly not a criterion of ownership that was fulfilled by the museum cura-

tors. This scenario would not be under Indigenous control and would require people to engage in concepts of identity that might be very different from their own, and certainly would require them to engage in concepts of obligation to the deceased which would be very different from their own. It would change the onus of determination of authority to speak from *place* to *lineage*.

At this stage, the question lies not in whether the results of DNA work may assist communities in their repatriation programs, but in ensuring that should such an avenue be pursued that it is community driven and designed from a fully informed position, which follows the core principle of free, prior, and informed consent.

Summary

There are distinct challenges that need to be navigated should communities decide to pursue DNA research to assist them in their repatriation programs. These include, but are not limited to, the following four considerations.

The first is ensuring community control and community designed processes. This is central and includes arrangements regarding intellectual property and data management of DNA both from the ancestral remains themselves and people today (reference collection).

The second challenge is to counter deficit discourse. Because the discourse that has constructed identities for people is deeply embedded and influential, it's important to be

aware of its presence and potential power. One of our repatriation project partners has adopted a simple strategy: if anyone wishes to have a conversation about authenticity, they simply walk away. How might this play out in terms of the compilation of a reference collection for a repatriation DNA research program? How much might such a program impact on identity politics and run counter to aspirations of healing and reconciliation that repatriation practitioners hold? Alternatively, DNA research for repatriation purposes could be used as counter-narrative to deficit discourse in the same way that repatriation itself can achieve this end.

Third, it is critical to understand the role of biology and sociality in identity. Genomics research is not currently proving to navigate well through the popular understanding of race and racial groupings. It will be important to understand the limitations of the knowledge that may be produced by DNA research and how results are represented. We don't know, for example, whether archive records that establish *place* and DNA testing that establishes *genetic ancestry* would lead to the same result.

Finally, communities have considered many other options to the question of how to appropriately inter the remains of unprovenanced individuals. This has occurred regionally and the National Keeping Place consultation shows that there are cohesive views on what could be done nationally. In the end, social answers using social processes to problems introduced

by the undignified collecting practices of people long ago may be the avenue that produces the resolve, healing, dignity and peace that funerals and memorials, in all their sadness, are supposed achieve. If DNA research is also part of this process, it is important that it achieves a similar purpose.

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THEME 3

Genetic Research with Indigenous Communities: Current Challenges and Future Directions

What lies ahead for the field of ancient DNA, both from a technological and an ethical standpoint? What does it mean for genetic research to be conducted “in a good way” with Indigenous communities? These questions are at the heart of the third session of the symposium, entitled “Genetic Research with Indigenous Communities: Current Challenges and Future Directions.” Featuring presentations from Kimberly TallBear (University of Alberta), Rosalina James (University of Washington), and Ripan Malhi (University of Illinois at Urbana Champaign), this session considers how historical factors and the current social and political landscape shape expectations and concerns around genetic research with Indigenous communities.

What role does Western science play in upholding the narrative of “whiteness”? How does science continue to propagate power dynamics that see white people controlling the research process and subsequent knowledge? In her presentation, Kimberly TallBear first examines the abuses committed in the name of science in Canadian residential schools before turning to ongoing debates over the right to study the remains of Kennewick Man and the remains of other

ancestors. From both a personal and academic perspective, TallBear argues that scientific narratives continue to privilege “whiteness” and maintain the power to define biological and, increasingly, genetic constructions of race. She also discusses several cases of how this continues today, despite most contemporary scientists’ explicit rejection of hierarchical ideas of race. Finally, TallBear highlights extra-legal strategies that can address tensions between indigenous peoples and genome scientists and their facilitators—ethicists, lawyers, and policy makers.

Beginning in the early 21st century, the Genomic Age has seen academic interests expand beyond Indigenous global migrations to health-oriented population genetic research. Rosalina James examines how the current environment, dominated by scientific narratives, tends to privilege race-based biological explanations for physical and mental health phenomena. Similarly, academic frameworks for individual and group identity are increasingly described through a lens of genetic-derived logic over the cultural, political, historical, and societal conditions that shape social beings. With the potential for genetic information to address health disparities,

James explains that, once again, Indigenous peoples must weigh the benefits of participation in genetic research with potential risks.

In his presentation, Ripan Malhi describes several ancient DNA projects in which he and colleagues have partnered with First Nations of British Columbia to conduct genetic analysis of both living community members and ancestors, the latter through the analysis of ancient skeletal remains. These partnerships, based on mutual respect and communication, were created in the wake of antagonistic relationships elsewhere between scientific researchers and indigenous peoples that impeded genomic knowledge among First Nations and Native American community members. In addition to developing a more collaborative and community oriented research framework, Malhi leads the Summer Internship for Native Americans in Genomics (SING) workshop at Indiana University. The workshop encourages discussion on indigenous cultural values and whether scientific methods can complement or promote these values, and seeks to increase the number of Native Americans in science research, leadership, and teaching careers at all levels.

Anthropology, Genomics, and Whiteness

KIMBERLY TALLBEAR

Video available online:

www.sfu.ca/ipinch/resources/videos/tallbear-dna

In this presentation, I focus on all of the sciences, social sciences, and humanities in upholding narratives of whiteness and the power of whiteness to define. In May 2013, Ian Mosby published an article in *Social History* that detailed shocking mid 20th-century nutritional experiments conducted on First Nations people in northern Manitoba and in six residential schools elsewhere in Canada. Aboriginal people were chronically malnourished, and, according to Mosby, “were starved and plainly not getting enough food to enable them to much more than keep alive” (Mosby, 2013: 146). Aboriginal people were already victims of a colonial state that had disrupted traditional lifeways and were then subsequently deprived of adequate government support. Support would be necessary when the very basis of one’s material life—one’s ability to live off of the land—is cut out from beneath one’s feet.

On top of the considerable hardships already suffered by Indigenous peoples, they were then used as a living human laboratory for nutrition scientists to pursue lines of inquiry about which they were curious. Scientists’ research questions included: 1) was the shiftless, indolent, and inert Indian really

simply a malnourished subject?; and 2) Were food supplies by traders after the Indian had been removed from his or her land inadequate in light of modern nutritional knowledge? Mosby’s documentation of this type of knowledge production is but the latest revelation of technoscientific research done on Indigenous peoples and other marginalized peoples from the standpoint of a colonial state that shapes and dictates standards of knowledge production. Until recently, mainstream scientists did not question these practices.

The assumption that underpins such research is that white people—usually heterosexual men—do the research. Indians and other people of colour, women, the disabled, and the “perverse” get gazed upon, poked, prodded, measured, bled, and written about. Technoscientific knowledge and indeed the knowledge production of the social sciences and humanities has clearly been shaped by the eclipsed intellectual priorities of a Western mind that has for so long “othered” Indigenous peoples.

Mosby also points out that colonial research—in addition to sometimes committing egregious ethical violations by post-World War II bioethical standards, such as not intervening in a subject’s near-starvation condition—also does little to alter structural conditions. For

example, it contributes to the colonial conditions that led to hunger and malnutrition in the first place in Canada. Or, to take another example, the structural conditions that make possible yet another ongoing and arguably colonial research project, which is the incessant examination of Indigenous populations and bodies marked by Type II diabetes. Like the starvation and malnutrition of 20th-century Aboriginal peoples, Type II diabetes is a condition prompted in no small part by the dispossession of Indigenous peoples from our land and lifeways. Yet, 21st-century biomedical researchers are on the hunt for a genetic trigger, further marking Aboriginal bodies as deviant and the source of the problem.

However, material deprivation originating from the state’s colonial extraction of land and resources is not addressed by well-funded researchers. Instead, through a narrative of genetic difference and deficiency they produce knowledge and direct funding priorities in certain directions and not others. Such research, Mosby notes, does more to bolster the career ambitions of researchers than it does for those who have been identified as malnourished. A chief concern that I have is how biomedical research priorities tend to build the capacity of non-Indigenous thinkers and institutions on the backs of Indigenous peoples

without building our own capacity. This, I would say, is the central condition of ongoing colonialism in 21st-century research.

In 1996, two Washington State college students tried to sneak into a hydroplane race on the Columbia River and stumbled upon one of the most complete ancient skeletons ever discovered in North America. In June 2015, it was announced that the 8,500-year-old so-called “Kennewick Man” is most closely related to today’s Native Americans. To the tribes in Washington, the announcement of their kinship to “the Ancient One,” as they call him, came as no surprise.

Since the remains were discovered in 1996, the Confederated Tribes of the Colville, Umatilla, and others have claimed the Ancient One as their ancestor. They have argued that he should be returned to them in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). However, vocal scientists protested against the tribe’s claims. They argued that there wasn’t sufficient evidence to link the Ancient One to living tribes. In 2004, a judge ruled that the Ancient One failed NAGPRA’s cultural affiliation requirement that a shared group identity must be traced from the skeleton to present-day members of the tribe through geography, kinship, folklore, and more.

It’s difficult to prove cultural affiliation with a 8,500 year-old skeleton. Some might think that proving a genetic link, if technical conditions are right, is a more straightforward and less political approach. But proving genetic affiliation is both technically *and* politically complicated. While new research methods may promise to validate Native American’s ancestry by using science to legitimize our claims, we also risk ceding tribal identity to institutions and their research interests.



Figure 1. An image of Kim TallBear’s ancestor, Chief Little Crow of the Mdewakanton Dakota. Photo Credit: John H. Gravenslund, 1862.

As a result, Indigenous peoples have good reason to be wary of researchers’ agendas. Scientific treatment of Native Americans’ DNA has been troubling and some-

times exploitative. It can clash with Indigenous understandings of kinship and identity, and it echoes science’s long history of using human remains—not only of Indigenous people, but also other people of colour—to prop up the notion that race is biological in ways that can reinforce society’s racist notions and practices. The long-standing tension between scientists and Indigenous peoples came to a new and subtle head in the fight for Kennewick Man. There are two potential outcomes of the Kennewick

case: 1) that the Colville Tribe’s jurisdiction will be challenged by scientists; or 2) that NAGPRA regulators will rule in the tribe’s favour. Both of these outcomes require that white people and white-controlled institutions and entities have the power to delineate and police Native American identity.

I’ve also seen this fight play out from a more personal vantage point. In 1863, a settler in Hutchinson, Minnesota, murdered Chief Little Crow, my great-great-great-great grandfather (Figure 1). His remains, or what was left of them after he was scalped and dragged through the streets before being decapitated, were put on display in the Minnesota state capital and later stored in a state archive. My great-grandfather and his uncle petitioned the archive for a decade (this took place long before NAGPRA) before his remains were released to my family for reburial in 1971. We buried Chief Little Crow in Flandreau, South Dakota, where I grew up and where many of his descendants live today.

As an academic, I work with scientists who take a variety of positions on the rights of Indigenous peoples to ancestral remains, including some who would have kept my ancestors' bones stored in an archive controlled by the colonial state.

Scientists were not quick to identify the Ancient One's Native American roots. The forensic scientists who first examined the skeleton assumed they belonged to a Euro-American settler but radiocarbon dating soon showed them to be much older. The scientists who protested his repatriation believed that the skull was different from contemporary Native Americans, perhaps more closely resembling Polynesians or the Ainu, the Indigenous peoples in what is today Japan.

The Ancient One's DNA was finally sequenced in the lab of ancient DNA expert, Eske Willerslev. Last year his team also published the first full sequence of an ancient Native American genome based on the 12,000 year-old remains of a small child unearthed of the property of Montana's Anzick family. By comparing the genomes of the Anzick child and Kennewick Man, the team showed that both persons were descended from the same ancestral population. When they compared the ancient genomes of those with contemporary Native Americans, Willerslev's lab found that Kennewick Man is more closely affiliated with contemporary tribes in the Pacific Northwest, including Colville, while Anzick child is more closely related with present-day Indigenous groups in Central and South America.

Willerslev's lab got favourable press for approaching Native American tribes and asking for their participation in the study. This included asking them to provide biological samples for comparison, although only Colville agreed to that part. For some Indigenous peoples these requests present a conundrum: if more tribes agree to participate and give biological samples then more local DNA will be available for comparison and Kennewick's relationship to specific North American tribes might be clarified. But some Indigenous peoples are still hesitant to participate given centuries of mistreatment. Thus, my question again is whose interests are served by research on Native American bodies? European and American scientists have been violating Native American graves for hundreds of years. In centuries past, scientists paid grave robbers to boil down stolen bones and to send them to American universities for examination and sometimes for public display. Indigenous peoples continue to battle globally with museums and universities to return their remains.

Other more subtle forms of exploitation continue to persist. Since the mid-1990's organizations such as the Indigenous Peoples Council on Biocolonialism ¹(IPCB) have deemed genomic research a form of colonization. Some scientists exploit Indigenous DNA for the intellectual and economic benefit of research institutions, and in some cases for pharmaceutical companies, but generally not for the benefit of the people being studied.

1. www.ipcb.org

In another famous case, the Havasupai tribe who live in the Grand Canyon allowed Therese Markow and other Arizona State University (ASU) scientists to collect blood samples in the hopes of finding medical insights into diabetes. The disease had reached epidemic proportions within the Havasupai's tribal population. University scientists also tried to do schizophrenia research, or at least apply for funding, which the tribe says they expressly forbade. Researchers also later used samples for studies on human migration, and genetic isolation or "inbreeding." Instead of improving the health of tribal members and descendants, these later studies contradicted the tribe's origin narratives and stood to damage its reputation. ASU eventually paid the tribe a \$700,000 settlement.²

Why should Native Americans help prove linear and no doubt overly simplistic theories of human migration that may also be used to cast suspicion on our claims to our ancestral lands? We have our own accounts of our histories and peoplehood. We emerged as peoples in intimate relation with these homelands and our non-human relations in those places. Some people read these as creation stories but I read them as complex representations of human and non-human relatedness in place. This isn't only about human bodies; it is also about non-humans. Indigenous peoples have not forgotten our relationship and the dues that we owe to our non-

2. For a review of the case, see: <http://genetics.ncai.org/case-study/havasupai-Tribe.cfm>

human relatives. That's another problem I have with all this genetic research: its too human-centric.

Some of us are also interested—especially if the research is done in a mutually respectful manner—in the roles of anthropological and genetic data in those histories. But scientific knowledge often portrays Indigenous peoples as just another group of immigrants. There is ongoing ontological bullying by Therese Markow, and other scientists who say, “knowledge is power.” Whose knowledge is power? She didn't mean our knowledge. That is something clearly generated by a science conditioned by centuries of white privilege.

The biological sciences have been wary of the term “race” ever since the horrors committed in Nazi Germany under the pretense of racial science. Today, scientists instead talk about “populations” and “ancestry.” Genomics in particular often reveals how similar people of different races actually are. But science shares with the law—and with white institutions in general—the power to define and police race. Genomics shapes popular thought and will inform United States policy that confers legitimacy on Native American claims to remains, cultural property, land, and tribal status.

Genomics reinforces the West's emphasis on lineal biological descent when it comes to questions of family, heritage, and identity. Mitochondrial DNA inherited from biological mothers, Y-chromosomes inherited from biological fathers, and autosomal DNA inherited from both parents are tied to

particular geographies and populations, which are then grouped into racial categories (e.g., “Native American” or “African” DNA). Genomics does not—and may not be able to—address more expansive Indigenous definitions of belonging. For Native Americans, culture and biology are often entangled. However, we also emphasize political status as a tribal citizen, political belonging, non-human relatives, and land as key to our identity. We also have controversial tribal blood rules that tribes have wrestled with throughout the 20th century, and still do. I have spoken elsewhere on the historical and in part colonial imposed race-based politics of blood³, but I won't go into detail here.

There are also ways of belonging that are not captured by tribal citizenship. We may have kin who do not meet our membership requirements but who live as family within our communities. Tribal belonging is a political category. It is also a simultaneous and extended set of biological and cultural relations. Each tribe works out its own rules according to its own evolving laws and cultural norms. In this case, Willerslev's lab produced results that are consistent with tribal viewpoints but what happens when those accounts don't line up? Why should scientists, mostly white folks in lab coats, get the final word on who is our kin and how our histories are told?

Inherent to whiteness is the power to define race categories and to regulate racial practices. White United States lawmakers codified

slavery, anti-miscegenation, segregation, and land tenure rights, and they defined the white-black race line, which mandates that “a person is classified as black if they have one black grandparent or great-grandparent.” Barack Obama has a white mother but cannot be seen as white in a land with the “one-drop rule.” The shifting goal post for whiteness ensured that the maximum number of black people could be enslaved for the economic benefit of white people. Slavery excluded black people from full citizenship, humanity, and social contact (real or imagined). Any attempts to pass as white have historically come at great personal risk to blacks subject to both state and rogue white enforcement of the race hierarchy.

Former Spokane NAACP official Rachel Dolezal's prerogative to self-identify as black despite having two white parents might be the apotheosis of the white privilege to define and change the categories we live by. Native Americans have also had our tribal identities enforced by white people. In the late 19th and early 20th centuries, federal lawmakers decided which Indians had become “white enough” and “assimilated enough” to become private landowners. Unsurprisingly, these categories were then used to shrink the number of Indians and collectively held tribal land bases. That freed up a lot of excess land for white settlers to claim. At the same time, white governmental agents had strong ideas about who was sufficiently Indian to constitute a tribal member. The first tribal registers delineating who was and who was not Indian were developed for the sake of

3. See TallBear 2003.

white people's land management. Today the United States Government and their legal, anthropological, and historical advisors ultimately decide the standards of ethnic and historical authenticity of tribes before federally recognizing them.

Anthropologist Circe Sturm has documented hundreds of cases of "playing Indian" in her book *Becoming Indian* (2011). Like the Dolezal case, we're plagued with whites that play Indian in order to speak with moral authority, to sometimes participate in ceremonies, and to take advantage of scholarship and job opportunities they might otherwise not have access to.

Andrea Smith is another example of someone falsely claiming Indigenous identity. She was publically outed in *Indian Country Today* and *The Daily Beast* and other publications this past summer for falsely claiming Cherokee identity.

Rachel Dolezal also claimed to be part Native American in that she was raised for part of her childhood in a tipi and hunted with bows and arrows. That claim was hardly noticed outside of Indian Twitter. While black and white are defined as mutually exclusive in

the United States, white has been defined as capable of absorbing red. This is an inheritance from 19th-century anthropological understandings of cultural evolution. Dolezal's wild Indian childhood claims were much less problematic apparently in the court of public opinion than her claims to be black. Many in academia have

white coat. Despite anti-racist aspirations, genomics potentially compounds the power of white controlled institutions to police non-white identity. It's part of an enduring Eurocentric monopoly on what constitutes knowledge and history. The tendency for science and its sustaining ideology, western civilization, and truth to

be viewed in opposition to non-western backwardness and superstition is another manifestation of white privilege. Again, people of colour are perfectly capable of taking that up. I've seen it at national meetings on health disparities for example.

Reports about Eske Willerslev's lab can sound to

the public like science has begun to make benevolent and politically correct concessions on behalf of superstitious Indigenous people. But I see it as science finally being held accountable to the humans—both living and dead—that it uses. It's becoming more ethical and more democratic in some corners thanks to the ongoing efforts of Indigenous peoples who are pushing the envelope and others who have worked in alliance with us, many of whom are in this room.

I just want to say that I've learned that there are two ways to elevate



Figure 2. Potential ways in which scientists can contribute to the Idle No More movement. Photo Credit: Kimberly TallBear.

asked me why these cases are important and why I talk about them. Don't we have more important things to worry about? But I see them as produced from the same histories of white privilege to name and define.

How can science become less "white privileged?" Not all scientists are white but they potentially access that privilege of whiteness when they don the symbolic

the rights and perspectives of Indigenous people in global scientific conversations. The first is to train scientists to do ethical, democratic, and collaborative research with Native peoples. The second is to train scientists who are themselves Indigenous. Figure 2 is an excerpt from the Idle No More strategy and I've highlighted in yellow where I think scientists need to get involved.

In this world, you cannot labour under the idea that you can be distant or not invested in politics. I've actually had scientists come up to me and ask what they can do to help. Read the Idle No More strategy and you will find that there's a lot of room to get involved in advising environmental movements, specifically as Indigenous peoples are linking the violation of Indigenous treaties to the violation of the earth. There's a lot of room for science in there too and we need scientific advising and literacy in order to effect change in this world.

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Exploring Indigenous Identity at the Intersection of Medical Genetics Discourses

ROSALINA JAMES

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-james

Hello and thank you for having me here. I first want to give respects to the First Peoples of this land and thank you so much for your prayers and your song. Before I get started, I want to consider a comment made earlier by Armand Minthorn. He said, “Science moves fast, we should be careful,” a comment that is very relevant to our conversation today.

In this presentation I will not be discussing ancient human remains as I don’t work with archaeologists. I do work with geneticists, social scientists, community-based organizations, and others who participate in genetic research. My work is situated at the crossroads and I try to bring people together to learn from each other. My research involves looking at what we’ve done—and what are we going to do—with DNA samples from living individuals and from those who are recently deceased, but also engaging with those from whom we have not collected samples yet. How will they know that we’ve collected their DNA? How will they know what we’re doing with it?

Scientific narratives tend to privilege race-based biological explanations for things that happen in the world over emotional and spiritual

explanations. They tend to describe things in compartmentalized ways and do not take into account Indigenous knowledge. However, it is essential that we start listening to and incorporating Indigenous knowledge into our interpretations of health.

Recently, my husband went to see our family physician. When the doctor asked my husband if there was anything that he wanted to talk about, he replied that he’d like to lose some weight. The doctor responded by saying, “we have this new medication that just came out. It’s FDA approved and doesn’t have many side-effects that we know of. It seems to be a really promising way of losing weight.” My husband answered that he was just thinking of eating better and exercising.

We’re living in a world where genetics seem to hold the answers to all of our problems. “Medicalization” is the term that’s been coined for this phenomenon. It refers to the process by which common problems, emotions, or traits come to be described and treated as medical problems. For example, a lot of children are “picky eaters,” but we now diagnose it as “selective eating disorder.” For depression, there’s now a whole spectrum of ways to describe it, including bipolar disorder. For senility, we used to say, “Grandma

is forgetting things,” but now we’re starting to learn a lot about amyloid plaques in the brain and how we start to lose our memory, as well as the other conditions that constitute dementia. We’re starting to define these conditions through science.

What we’re seeing in the context of defining these conditions is that it often leads to a new treatment of some sort. One example is attention deficit/hyperactivity disorder (ADHD). One study by the Center for Disease Control (CDC) showed that 2 million more kids were diagnosed with ADHD over an 8-year period. In the United States, from 2011- 2012, 11% of children aged 4-17 years were diagnosed with ADHD. Of the kids diagnosed with ADHD, almost 70% take medication and will continue to do so for the rest of their lives.

Sociologists have been aware of this phenomenon for a long time. It has been described as “an extension of medical authority in different areas of everyday life, [which] is thus understood from the perspective of the social control it implies when behavior deemed to be deviant is transferred from the social to the medical arena” (Fainzang 2013). As medical knowledge bases have grown, discoveries have revolutionized biotechnology and pharmaceutical industries. What we’ve seen over the years

and decades is an interweaving between industry and our medical enterprise. The promotion of products to providers and the public has evolved into new markets for social anxiety and other commonplace experiences that are subsequently being targeted for medical intervention.

Medicalization is also tied into our media workforce and, thus far, the focus has been on identifying risk factors to be treated by personalized precision medicine. In this new era of precision medicine, \$200 million will be spent on sequencing the full genomes of a million Americans. This marks a shift in academic interests from Indigenous global migration to include more medically driven population genetic research. The promise of novel drugs, genomics, neuroscience, and genetic diagnostic tools—many of which are intertwined with the market place—has introduced and sustained medicalization in a new era.

A lot of people refer to this process as “geneticization.” In the United States, the dominant biomedical model has permeated modern society and culture whereby common problems, emotions, or behaviours are described as medical issues that can be treated. Again, they’re framed as “problems” instead of normal experiences that we should be dealing with without medication. Moreover, the frameworks for individual and group identity are increasingly described through a lens of genetic-derived logic over the cultural, political, historical, and societal conditions that shape social beings. I think that’s a really

key point: we’re no longer talking about groups or communities. Instead, we’re talking about our own personal genetic profiles and genomic profiles for populations. It also constitutes a shift in the language that we see in public discourses. These technologies have had a very complex relationship with identity politics.

Catherine Bliss (2013) has written quite a lot about this and she states that the “marketization of race through genetic testing, drugs, etc. thus redirects identity from an inclusive political group empowerment to a personal negotiation base for social status.” It’s also a “reductionist understanding of inferences between genetics (our biological selves) and identity.” It’s a lot bigger than genetics, and “the dominant voices behind consumer genetics ignore this complexity and stick to a simple narrative in which our genes have the power to tell us who we are.”

The move from medicalization to geneticization refers to “a pill for every ill,” and that there’s a genetic solution to every problem. But the big question is: does our genome really tell us that much about ourselves? And how many voices are questioning the geneticization of our lives? I don’t see enough voices pushing back on that in the dialogue that’s going on in the United States. Here’s an example: could a genetic test predict the risk for suicide? There’s actually a team at Mount Sinai Medical Center who are working on a genetic test to predict suicide risk. Given how many people already take antidepressants, the test is

already being linked to potential downstream products. But why not use the decades of behavioral science research we’ve done or the decades of Indigenous knowledge on how to empower young people, particularly young men. We know there’s higher risk for young men, so how do we empower them to be part of a community, to have an important role, to learn reef netting and to reincorporate that knowledge into how we’re creating communities and supporting our people. Why are we going towards the shiny things rather than putting our resources into the not so sexy things? We are fascinated with genomics and our genetic profiles.

It’s important to realize that genes are not static. The field of epigenetics looks at how DNA evolves and how it expresses itself at different times. Your genes express themselves differently depending on what you eat, if it’s cold out, if you get enough sleep or not, and we need to take these complexities into account. We’re starting to do that with epigenetics but it’s still a new science and it’s very complex. It’s important to consider how stress and trauma, such as that experienced by residential school survivors, manifests itself in the epigenome. People here know the story of Indian residential and boarding schools. This is something that affects all of us, not just generations ago, but continues to affect my family today. In fact this quote is from my great aunt, who remembers that she used to “stand in the window and cry.”

Moving forward we’re also looking at how other environmental

factors interact with our genomic makeup. It keeps getting more complex. However, what I want to get at is whether we're answering the question in a way that we're going to make a difference. Other factors such as our diet and environmental contaminants may interact with our genome and cause health conditions or vulnerabilities. But we can't just ask these questions. We also need to learn what we can do about it in the end, including cleaning up our water systems, our earth, and our relatives that are non-human. We need to recognize that we're urban, we're reservation, we're everywhere, and so we're not one kind of people.

What does this have to do with identity? Everything! I'm an enrolled Lummi Tribal member and when I think about my great-grandfather who was Duwamish, they didn't allow Native people to be in Seattle after a certain time. He got in a canoe, moved up to Lummi, and that's how we became enrolled Lummi. How can that be teased apart through my biology? I don't really know. Identity is who you are. We can't take the human piece out of this. Identity is comprised of your cultural identity, your multicultural identity, how you self-identify, your social experiences, whether you're enrolled, whether you're a descendant, or if you're part of multiple Indigenous communities, as many people are. Indigenous people have forever understood that you need to be sure that you don't marry your cousin, so you need to ask questions. We've always been geneticists and scientists.

We're giving science a misplaced sense of concreteness and we need to think outside of that box. We need to accept other knowledges as part of the solution that we're seeking. Propelled by the promise of using genetic variation information to address health disparities, Indigenous peoples are once again faced with weighing the benefits and potential risks of being exploited by science. As Indigenous people, we need to make these decisions in a way that's very thoughtful and not just shut the doors to it; science has a lot to offer. However, in order to make this decision, we need to be educated and actively engaged in the conversation.

In the United States, the National Institute of Health is going in a different direction than what I think communities are really interested in. It's focusing on broad consent so that DNA samples can be used for other studies without the researchers needing to go back and obtain permission. The samples could be used for a different study on something like schizophrenia, or for any other research questions. We're moving towards big repositories, big data, and big samples for many populations. Generally, tribes have ownership and control over the data. However, many people are not part of federally recognized tribes and we need to consider how to protect them if they choose to participate in biomedical or other research.

I think Dr. TallBear has done a fantastic job of discussing some of the historical missteps that we've had.

But we really need to be thinking about *why* we're asking a certain question and how is it going to benefit not just our community, or our relatives, or even our children, but maybe many generations from now. There are a lot of Indigenous groups that are interested in partnering with researchers—or even leading research—and scientists can play an important role by supporting these efforts.

However, educating and supporting more Indigenous scientists, politicians, and health administrators right across the board is essential. Supporting Indigenous scientists will change the research process. For example, following the misuse of their samples, in 2008 the Nuu-Chah-Nulth developed an ethics code¹ that states, "Researchers are collectors of information and producers of meaning, which can be used for or against Indigenous interests." We need to be thinking about data because it is a resource. The data we produce will be around forever and lots of new questions will come up. How do we protect the data and ourselves? How do we put the right restrictions and controls on it so that it's used appropriately?

Again, it's very important to consider tribal sovereignty. Not many scientists understand sovereignty. In fact much of the general public doesn't understand sovereignty or even know it still exists. For that matter, many people don't know that Native Americans still exist. They think we're all in museums. So we always have to be educators,

1. www.cahr.uvic.ca/nearbc/documents/2009/NTC-Protocols-and-Principles.pdf

wherever we're going. We always have to wear that hat. It should be that scientists have to go through an educational curriculum before they consider doing genetic research and other work with tribes.

We have a lot of models for research but I think the First Nations Principles of Ownership, Control, Access, and Possession² (OCAP) in Canada from the Canadian Institute of Health Research is further ahead than what we have in the United States. We look to you for the ways that we can implement this kind of ethics code in our country. Thank you for your time.

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2. <http://fnigc.ca/ocap.html>

Partnerships with First Nations of British Columbia on Studies that include DNA Analysis

RIPAN MALHI

Video available online:

www.sfu.ca/ipinch/resources/videos/dna-malhi

Good afternoon everybody. First, I'd like to thank the First Peoples of this land. I'd also like to thank the organizers of this symposium. Today I want to talk about partnerships with First Nations people of British Columbia that include DNA analysis that I've worked on with Dr. Jerome Cybulski. Dr. Cybulski couldn't be here today but he sends his regards.

I want to start by talking about our partnership principles. These are respect, mutual benefit, and communication. These three principles should look familiar as they are the foundation of any healthy relationship. They also overlap with the ethical principles of the Belmont Report.¹ As I proceed through this talk, I will give examples of how we operationalize these principles, as well as mention other safeguards put into place to protect community members and communities beyond the usual expectation of obtaining Institutional Review Board (IRB) approval. Many of these partnerships in British Columbia are based on relationships that Dr. Cybulski had built prior to us beginning DNA studies with these communities.

¹ https://videocast.nih.gov/pdf/ohrp_appendix_belmont_report_vol_2.pdf

Our partnership with the Canoe Creek Band and nearby communities began when Dr. Cybulski visited the community in 2002. He was there to seek authorization for and cooperation with the analysis of burials that were recovered nearly 20 years earlier at nearby China Lake (see Figure 1). Dr. Cybulski gave a talk to community members, which was well received. Following his presentation, he was taken to other suspected burial sites in their territory where remains were eroding out of the ground. At the request of community members, Dr. Cybulski was able to confirm that some of these remains were human, specifically at the Big Bar burial site. Over the next few months, community members pondered how to best protect the remains from further erosion and vandalism, as there was a high traffic road nearby that led to a provincial park.

Eventually, community members expressed an interest in working with Dr. Cybulski and another archaeologist, Dr. Alan McMillan, to excavate the human remains near Big Bar Lake. In the following year the excavation began with a smudging ceremony. Over the course of the excavation many community members camped overnight to ensure that the remains were not stolen or vandalized. Community members observed and assisted with excava-

tion and, upon completion, additional ceremonies were performed, including a burnt food offering. The First Nations community agreed to allow limited destructive analysis to obtain information such as radiocarbon dates, isotopic analysis to understand diet, and DNA analysis to learn from their ancestors.

BELMONT REPORT

Published in 1979, the *Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research* recognizes three fundamental ethical principles that must be followed in research involving humans: 1) Respect for Persons; 2) Beneficence; and 3) Justice.

It was at this point in time that Dr. Cybulski contacted me to work with him on the DNA studies. With Dr. Cybulski and Dr. McMillan, I visited the First Nations communities in 2005 and gave a public presentation on the uses and limitations of DNA analysis on ancient skeletal remains. During this visit, I also collected saliva samples from community members. Through the research partnership we established, we were able to use DNA as a tool to learn about the population history of the community. This was done in combination with other forms of information, including oral histories, traditional



knowledge, and archaeology. Protocols were established to anonymize samples taken from community members and to restrict data access to research only on demographic history. Policies were also established to work closely together before publishing any results of the study. This was done to safeguard against any potential harm to the community.

The China Lake and Big Bar ancestral remains were reburied in 2006 and 2008, respectively. All of these remains dated to the mid-Holocene, around 5,000 years before present. At the time when this study was conducted, we were able to analyze mitochondrial DNA. The Big Bar remains exhibited a mitochondrial lineage, haplogroup A2. Haplogroup A2 is found in Indigenous individuals living along the coast as well as in the interior of British Columbia. However, the China Lake individuals were found

to possess a mitochondrial genome not currently found in sampled Indigenous individuals from the Americas. This lineage may either be in very low frequency or it may not exist anymore, possibly as a result of European contact and colonization.

I'd like to spend some time discussing the characteristics of mitochondrial DNA (mtDNA) and some of the limitations of the mitochondrial genome. Mitochondrial DNA is small, circular in structure, and is found in multiple copies in nearly every cell in the body. We inherit our mitochondrial DNA from our mother and so it traces your maternal line. In Figure 2, you can see that squares are males and circles are females, horizontal lines are marriage and vertical lines are offspring. If this red circle in the middle is you, then your mitochondrial DNA traces all the way back maternally (demonstrated by the

Figure 1. Ancestral human remains were found at the China Lake site in British Columbia. In partnership with the Canoe Creek Band, Ripan Malhi, Jerome Cybulski, and his team successfully extracted and analyzed ancient DNA from the skeletal remains. Photo Credit: J. S. Cybulski.

red circles). It doesn't give you any information about all of these other ancestors that you have (represented by black circles). If you go back three generations, it's tracing one individual out of eight. If you go back five generations, it's tracing one individual out of thirty-two, and so on. Thus, mitochondrial DNA analysis is limited in the information that it can provide.

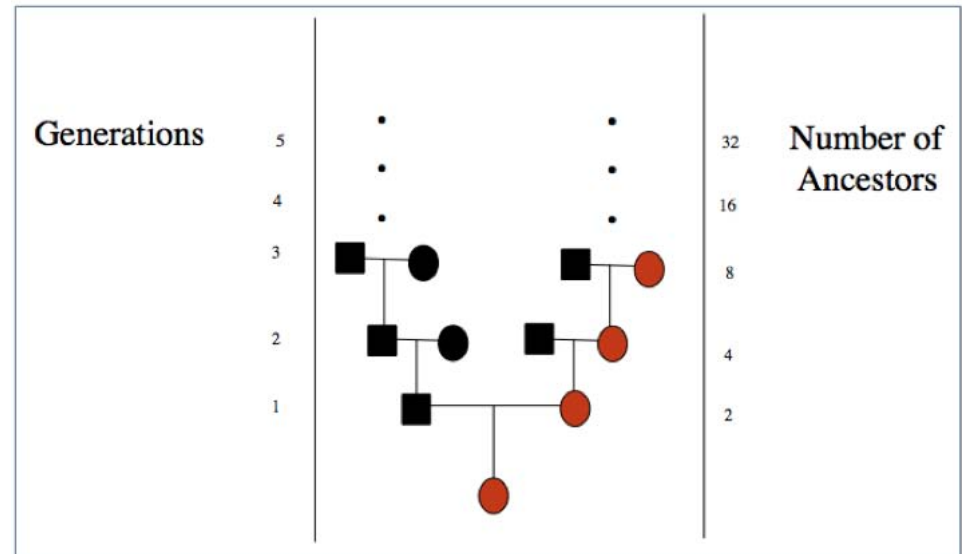
Over the past decade, there have been rapid advances in genomic technologies and analyses. Whereas we used to analyze a small portion of the mitochondrial genome, between 300-600 base pairs, we can now analyze the complete mitochondrial genome, all 16,500 base pairs. Before these advances,

it was very difficult to get any surviving nuclear genetic material from ancient skeletal remains. We can now gain information from all 24 pairs of chromosomes from ancient individuals, as well as from saliva samples given from living individuals. This type of analysis gives us information about all of an individual's ancestors, not just their maternal lineage.

We were able to use these genomic technologies in another partnership on the Northwest Coast. In 2009, Dr. Cybulski and I began a partnership with Tsimshian- speaking First Nations in the Prince Rupert Harbour region. The study involved genomic analyses of living community members and of ancestral ancient skeletal remains recovered from this area. Skeletal remains of over 250 individuals dating to between 500 and 600 years before present are currently housed at the Canadian Museum of History in Gatineau, Quebec. When we partnered with these communities, it was clear that genomic analyses would be considered alongside other forms of information, including their rich traditional knowledge base, oral histories, and archaeology in this region.

Our First Nations partners allowed the taking of samples for limited destructive analysis.

We employed the same partnership principles as we did with the communities in the interior of the province. We also made several additions to these protocols: 1) to clarify the roles and expectations of the parties involved in



the partnership; and 2) to better safeguard First Nations partners from potentially harmful results, we signed a contract with the communities. At the request of the communities, we also expanded our communications to include their legal representatives. I can't tell you how many hours I've spent on the phone talking to lawyers and discussing possible scenarios of what could happen in the future with regards to the DNA study.

We continued to visit the communities in person annually, but in 2012 I had a major life-changing event, so extreme that I can barely remember the first year after this event: I had twins. As a result, I wasn't able to travel up here as much as I would have liked. I started relying on such communication technologies as Skype and other video conferencing tools to talk with the First Nations communities. Surprisingly, I ended up talking with our partners much more than I did when I had relied on my annual in-person trips.

Figure 2. Mitochondrial DNA (mtDNA) is passed down through the maternal line. The red circles show how mtDNA is passed down from generation to generation through the female line. Reprinted with permission from Ripan Malhi.

The other new development was that we invited community members to participate in the Summer Internship for Native Americans in Genomics (SING) workshop² at the University of Illinois, where I am based. This is a weeklong workshop in which we discuss the uses and limitations of genomic research for Indigenous peoples. Before I discuss this in detail, I'll first summarize some of the results from our partnership with First Nations communities on the coast.

By looking at mitogenomes of mid-Holocene individuals and community members, we were able to find a DNA link between an individual from the Lucy Islands (Ancient 938) who radiocarbon dated to about 5,000 years ago, and an individual from Dodge Island with

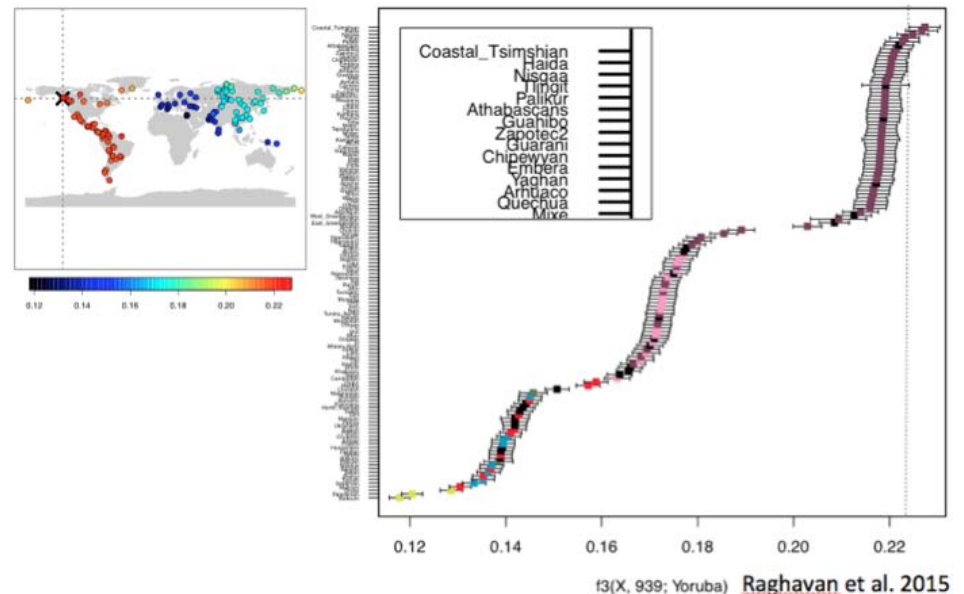
2. <http://conferences.igb.illinois.edu/sing/home>

a very similar mitogenome (Ancient 152) who radiocarbon dated to 2,500 years ago. This individual had the same exact mitogenome as a living Tsimshian-speaking individual (T018).

We found another connection but this was with multiple individuals from multiple communities in the geographic region. The final—and unexpected—connection that I want to talk about relates to Ancient 939 from the Lucy Island site who was radiocarbon dated to around 6,000 years ago. We didn't find any connections with living community members in this region. However, we did find a close connection to a mitochondrial genome from another ancient individual from Prince of Wales Island who dates to about 10,000 years ago. We were able to find a mitogenomic connection from 10,000 years to 6,000 years but not to communities today. It's critical to remember that in these analyses we're focusing solely on the mitochondrial genome and thus are limited to information from the maternal lineage.

Last year we published a study (Raghavan *et al.* 2015) where we were able to look at a low coverage genome from Ancient 939. This slide ended up being rather complicated so I'll break it down for you (Figure 3). Looking at this map, which is called a Heat Map, the more red a circle is (representing present-day communities) the greater affinity to the Ancient 939 individual. As you can see, in the Americas it's mostly red. This other figure (right side) shows genetic affinity to communities in a similar

Genome analysis of 939 shows a close genetic affinity with First Nations in the same geog. region



geographic location. The further to the right a community is, the more closely they're related to Ancient 939. The closest genetic affinities are with Coastal Tsimshian, Haida, and Nisga'a.

However, there are other communities that also show a close affinity to Ancient 939 and they are in Central and South America, which is unexpected. Overall, there seems to be a trend showing genetic affinities to communities in the same geographic location but then you also have other unexpected affinities, such as that with Ancient 939. We've already talked about The Ancient One (Kennewick Man) and showing genetic affinities to communities in the same geographic location. Another f_3 heat map with the Colville tribe indicates an affinity with other groups located in Central and South America.

For this study we developed a direct ancestry test in which the clos-

Figure 3. Genomic analyses demonstrate that Ancient 939 shares close genetic connections to First Nations communities living along the Northwest Coast of British Columbia. Reprinted with permission from Ripan Malhi; images from Raghavan *et al.* 2015.

er the final number is to zero, the closer the genetic affinity to Kennewick Man. You can see that the genomes from the Colville individuals are much closer to zero than other individuals from different communities around the world. However, as many people have pointed out, genomic research is rapidly advancing so I wouldn't be surprised if this test is eventually replaced because it is based on a very simple model.

Now I want to come back and talk about the Summer Internship for Native Americans in Genomics (SING). SING's goal is to increase interest and participation by First Nations peoples in scientific research, to use genomic tools in an Indigenous framework, and to train community members in genomic science. We began the SING work-

shop in 2011. SING is a one-week workshop where students and tribal community members learn about genomics through hands-on training in molecular biology and bioinformatics. This is accompanied by discussions on the social, ethical, and political implications of ancient DNA research.

A central goal of the SING workshop is to increase the number of Indigenous researchers in genomic science but there are many other functions that I think this workshop serves, including as a support network for current Indigenous scientists. What do we do in this one-week workshop? We have participants in the molecular biology teaching lab (Figure 4) and, if they want to, participants can extract and analyze their own DNA. As genomic technologies have advanced, we're no longer analyzing small bits of DNA.

We also have extended discussions on the ethical, legal, and social implications of genomics for Indigenous communities. We have had engaging lectures from many of the people who are here in this room, as well as others. Since 2011, we have had four workshops resulting in 50 SING alumni from 44 different Indigenous communities. We just submitted our NHGRI renewal to continue this workshop.

Thank you.



Figure 4. Participants in the SING workshop learn about the potential for genomics to empower Indigenous communities. Photo credit: Kathryn Coulter and reprinted with permission from Ripan Malhi. Photo retrieved from SING website: <http://conferences.igb.illinois.edu/sing/home>

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PART THREE | CONCLUSION

Towards a Better Understanding of Indigeneity and DNA

GEORGE NICHOLAS & ALEXA WALKER

Much as the advent of radiocarbon dating in the late 1940s revolutionized archaeology, advances in DNA research and technology are doing the same for our understanding of who we are, both as a species and in the most personal sense. On the one hand, DNA technology has shed astounding light on population movements thousands and tens of thousands of years ago, as well as confirmed or contradicted what we know—or thought we knew—about ancient lineages and the identity of individuals of historic importance. On the other hand, it has allowed individuals to know in the most intimate detail their parentage and genetic lineages. The end result is that while DNA testing may analyze very small pieces of human tissue, the findings may have a very large impact on our understanding of humanity.

But with new technologies come new responsibilities, as well as new and often unanticipated ethical, religious, and legal quandaries. For Indigenous peoples, whose lives have been transformed by loss of land, of language, and heritage, the implications of new DNA technologies are of great concern, especially in the field of archaeology where the study of Indigenous heritage has long been at the core of the discipline. In North America, for example, 99.9% of the archaeological record is associated with the ancestors of contemporary

Native Americans and First Nations peoples. A “science first” attitude has long dominated research on and preservation of that heritage, with very limited accommodation of Indigenous concerns and values. Ironically, Indigenous DNA has become such a valuable commodity in the sciences, representing what some consider to be “original” or biologically isolated populations that provide an important point of reference for a variety of scientific studies.

The result is that while DNA research is providing previously unimagined insights into ancient and modern populations, these technological advances present significant ethical challenges, ranging from debates over histories of indigenous group movement, land tenure, continuity, and intangible heritage issues; to concerns over the ethics and practicality of obtaining both individual and group informed consent; to how DNA studies may require rethinking long-held understandings of identity and ancestry. A variety of concerns have thus emerged that require serious consideration, including who controls, who benefits from, and who has access to the information derived? And what are the consequences of inappropriate use of DNA-derived information?

Addressing these questions is not simply an academic exercise but

an urgently needed task as the answers may have direct and tangible effects on the well-being of Indigenous peoples. Thus, as much as DNA research is revolutionizing what we know, DNA research methods themselves need to be transformed in order to acknowledge and respect Indigenous peoples.

This is a challenge not just for researchers but also for Indigenous communities. Indeed, as workshop participant Armand Minthorn noted, “There is a balance that needs to be considered very carefully between genetics and Indian ways of life. What authority does genetics and science have over Indian ways of life? I do not want genetics or DNA or science to affect our ways of life that have been here for thousands of years.”

How can we balance the tension that all too often exists between traditional values and DNA technology? How do we move past an unsavoury history that saw frequent exploitation of Indigenous peoples by researchers, and start building trusting and respectful relationships?

The “DNA and Indigeneity: The Changing Roles of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation” public symposium and the two-day workshop that followed provided a unique

opportunity to explore these other questions relating to indigeneity and DNA, such as: What are the potential implications of modern and ancient DNA analysis when used to redefine identities and cultural relationships across time? How do we best deal with the notion that ancestries are multiple and fluid? What are the ethics and practicality of obtaining both individual and group informed consent for DNA research? And what happens when DNA research results and indigenous histories and beliefs don't agree?

Rather than reiterate points already provided on these topics or offer a high-level analysis of workshop discussions, we conclude this volume by sharing ten important insights gleaned from the symposium presentations and workshop discussions on indigenous identity at the interface of culture and biology.

Working at the Crossroads of Genetics, Biology, and Identity

Issues of identity are of particular importance for Indigenous peoples, for whom scientific pronouncements about identity claims may have profound social, cultural, political, and economic consequences. There is thus a pressing need to investigate how genetic research is today being used to reconstruct understandings of identity, and the pertinent implications biological information and genetics in particular may have for Indigenous peoples' land claims, the repatriation of ancestral human remains, band enrollment, and attaining federal recognition.

Starting with the premise that "identity" is as much a product of cultural factors and affinity as it is of biological ones:

- Sociopolitical organizations such as communities, bands, tribes do not always map neatly onto DNA population profiles. Populations—past and present—are not static, but always changing. The history of colonization, coupled with ongoing human interaction and movement, has shaped the genetic profiles of present-day populations. Thus, ancestries must thus be viewed as multiple and fluid.
- Limited samples from ancient remains restricts the degree to which genetic relatedness can be inferred between ancient and contemporary peoples. The result may be an actual or potential lack of correspondence between historical, cultural, and genetic indicators of identity—as one participant stated, "Culture is complex and messy; science likes certainty and precision"
- DNA analysis can have far-reaching, long-term, and complex implications for Indigenous peoples. Genetic bioarchaeological data co-exist with other forms of understanding identity and cultural relationships. Therefore, genetic analysis for any purpose should therefore be viewed as a final step once all other potential sources of information have been considered, including archaeology, physical anthropology, traditional knowledge, and other sources.
- Human remains and biological samples, regardless of origin, should receive equal treatment under the law. Yet repatriation has operated largely within a Western legal regime, with only limited accommodation or understanding of Indigenous worldviews. Researchers need to acknowledge that customary laws and religious beliefs are central to the wellbeing of many Indigenous peoples. Local values and scientific goals must be both carefully considered.
- Free, prior, and informed consent is already a *de facto* part of the research process. However, too little attention has been devoted to the risk that Indigenous peoples incur when participating in DNA-oriented research. These range from concerns about genetic discontinuity between an ancient and modern group that may jeopardize land claims, to loss of tribal enrollment status, to questions about paternity.
- DNA "hype" is problematic. The popular perception that ancient DNA analysis is a highly specific and precise venture is largely the result of an oversimplification of the results, with less attention paid to the nuances inherent within the data. That it can provide absolute answers is often a fallacy. What is often ignored in media stories is that factors such as sample size and type of DNA (mtDNA vs. whole genome) can affect interpretation of research results and the ensuing conclusions that are shared with the public. Mis-information and misinterpretation of genetic data by scientists, the public, or by specific interest groups, can detrimentally affect Indigenous groups whether by omission, oversimplification, or downright error.

- There is an urgent need for researchers, communities, policy makers and others to develop legal and ethical means to protect genetic samples originating from ancestral human remains or contemporary Indigenous populations that sensitive to cultural values and legally robust. These include consider new approaches to genomics, including non-destructive sampling, community-controlled biobanks, and tribal repatriation consortia that situate genetic information alongside—not competing against—Indigenous oral histories and traditional knowledge.

- Collaborative projects work when the communities are fully informed, and are full and equal partners in the decision-making process from the start. Developing such projects requires developing trust and mutual respect, which may take considerable time and effort to achieve, but can yield positive and mutually satisfying results. The aim needs to be consent, not just consultation.

- Finally, and perhaps most importantly, DNA analysis is not the end point. It should instead be seen as the *beginning* of an important opportunity for learning, collaboration, and critical discussions about genetic research and what constitutes “identity.”

Workshop Participants

* Indicates symposium speaker

Dr. Jessica Bardill is Assistant Professor, Department of English, East Carolina University. Her work engages the role of narrative medicine in wellness, ethical issues between communities and researchers, as well as the power of literature to resist and change national narrations of being and belonging.

* **Dr. Deborah Bolnick** is an Associate Professor of Anthropology and affiliated with the Population Research Center at the University of Texas at Austin. Her research examines genetic variation in Native American populations and how it has been shaped by culture, history, and geography.

Dr. Brian Egan served as IPinCH Project Manager from 2012 to 2016. Trained in both the natural and social sciences, his career has spanned a broad range of positions, including field ecologist, environmental consultant, research associate, policy analyst, and field operations supervisor. For much of the past decade, Brian's work has focused on Aboriginal and resource rights in Canada, with a particular focus on land and treaty issues in British Columbia.

* **Victor Guerin** is a member of the Musqueam First Nation and speaker of hə́n̓qəmiṇəm̓, the Musqueam dialect of the Central Coast Salish language. He is past coordinator of the Musqueam Language and Culture Program and has worked as a cultural researcher and tour guide at the UBC Museum of Anthropology. He works with elders from his own and sister communities learning about the cultural beliefs and traditions of his people including oral history, traditional narratives, songs and dances.

* **Dr. Cressida Fforde** joined the National Centre for Indigenous Studies (based at Australian National University) as its Deputy Director in November 2011. Her primary research focus has been the history of the removal and subsequent study of Indigenous human remains by European institutions within the

'race' paradigm in the 19th century and campaigns to secure their return.

* **Dr. Alan Goodman**, Professor of Biological Anthropology, teaches and writes on the health and nutritional consequences of political-economic processes such as poverty, inequality, and racism. His current research includes projects on malnutrition in Mexico and Egypt, and the stresses of slavery in New York. He is co-chair of IPinCH's Bioarchaeology and Genetics Working Group.

Dr. Sara Juengst is an anthropological bioarchaeologist in the Department of Anthropology Appalachian State University, and analyzes skeletons from archaeological contexts in Peru and Bolivia in order to document and understand their lived experiences. Her research interests include paleopathology, violence-related trauma, diet and the body, and the embodied aspects of social and genetic communities.

* **Dr. Dorothy Lippert** is Choctaw and works in the Repatriation Office of the Smithsonian National Museum of Natural History. Dorothy has written extensively on the subject of repatriating human remains and archaeological ethics. She is co-chair of IPinCH's Bioarchaeology and Genetics Working Group.

* **Dr. Rosalina James** is an Assistant Professor in the Department of Bioethics and Humanities at University of Washington. Her interests include developing strategies responsive to community interests in research, assessment of community-based participatory research partnerships, and translational research ethics.

* **Dr. Ripan Malhi** is an Associate Professor in the Department of Anthropology at the University of Illinois at Urbana-Champaign. Based at the university, the Malhi Molecular Anthropology Laboratory generates DNA variation data from different genetic systems to infer evolutionary history of populations and species.

* **Armand Minthorn** is a Religious Leader and member on the Board of Trustees for the Confederated Tribes of the Umatilla Indian Reservation. Armand is a vocal advocate for the repatriation of The Ancient One (also known as Kennewick Man).

* **Dr. George Nicholas** is Professor of Archaeology, Simon Fraser University, and Director, Intellectual Property Issues in Cultural Heritage (IPinCH) Project. His research focuses on Indigenous peoples and archaeology, intangible heritage, and archaeological theory. He directed SFU's Indigenous Archaeology program in Kamloops, BC from 1991-2005.

Dr. Teresa Nichols, a postdoctoral fellow and project manager for Indiana University's "Learning NAGPRA" project, is conducting research on how students learn and educators teach about NAGPRA and professional ethics. This project aims to develop resources on issues relating to professional ethics, working with human subjects, building cultural competency and relationships with Native American communities, and NAGPRA consultation and compliance.

* **Dr. Daryl Pullman** is a Professor of Medical Ethics in the Faculty of Medicine at the Memorial University of Newfoundland. He has published widely on a variety of issues in research and clinical ethics, and has a particular interest in issues related to genetic research and therapy. He is co-chair of IPinCH's Bioarchaeology and Genetics Working Group.

Dr. Susan Rowley is Curator of Public Archaeology, Museum of Anthropology, Associate Professor of Anthropology, and Director, Laboratory of Archaeology, UBC. Her research focuses on repatriation, representation, and the shifting balances of power in collaborative projects. She is the Museum of Anthropology's representative for the Reciprocal Research Network (RRN), a co-development project of the Musqueam Indian Band, Sto:lo nation/Tribal Council, the U'mista Cultural Society and the Museum of Anthropology.

Dr. David Schaepe is the Director & Senior Archaeologist of the Stó:lō Research and Resource Management Centre at Stó:lō Nation, addressing issues of aboriginal rights and title, heritage management policy and practice, repatriation, land use planning, archaeologi-

cal research, and education and outreach. He has over 25 years of experience in community collaborations, cultural heritage research, and resource management.

Dr. Ernesto Schwartz-Marin is a Research Fellow in the Department of Anthropology at Durham University. His research is on the relations and dynamics between truth making, genetic science and notions of nation, and ethnicity and race. His project "Forensic Science and Nation Building in Latin America" examines the field of forensic science (specifically genetics and physical anthropology) relative to ethnicity and race in Mexico and Colombia.

* **Dr. Kimberly TallBear** is an Associate Professor of Native Studies at the University of Alberta. She is an enrolled member of the Sisseton-Wahpeton Oyate in South Dakota, descended from the Cheyenne & Arapaho Tribes of Oklahoma, and raised on the Flan-dreau Santee Sioux reservation in South Dakota and in St. Paul. Her research focuses on the historical and ongoing roles of science and technology in the colonization of Indigenous peoples and others.

Alexa Walker completed her MA in the Department of Archaeology at Simon Fraser University in 2015. Her thesis, "Ancient DNA Research in North America and Abroad: Challenges and Opportunities," explored the potential social, ethical, and political implications of ancient DNA research for Indigenous communities and researchers working around the world. She was a Research Assistant for the IPinCH Project from 2012-2016.

DNA & Indigeneity Workshop Program

This volume centers on the presentations given in the public symposium, but no less important was the two-day workshop that followed on the same theme—“DNA and Indigeneity: The Changing Roles of Genetics in Indigenous Rights, Tribal Belonging, and Repatriation.” The workshop organizers (Goodman, Lippert, Nicholas, Pullman, and Walker) intentionally developed an invitation list of individuals with broad outlook and experience in this realm. The result was an opportunity for rich and focused discussion on many different dimensions of the workshop theme—ethical, historical, scientific—from both indigenous and non-indigenous perspectives. This, in turn, facilitated an open and honest engagement with some very difficult challenges and opportunity to look for ways to engage with the communities, researchers, and policy makers who are involved with DNA research.

The workshop was organized into four sessions, each focusing on a different theme but clearly with considerable overlap: 1) DNA and the Repatriation of Human Remains; 2) Land and Identity Based Rights; 3) Biogenetic Identities and Tribal Belongings; and 4) Working at the Crossroads of Genetics, Biology, and Identity: Developing Tools for Researchers, Communities, and Other Stakeholders.

Each of the sessions was facilitated by one or more workshop participants, who also assigned readings in advance of the workshop. These are listed at the end of each session description below. A broader bibliography of recommended readings and resources was also made available to participants and the public, which is included here as Appendix C.

A more comprehensive reporting on the workshop is forthcoming, along with a number of other products.

One key takeaway message from the workshop is the need to support Indigenous peoples around the world in their efforts to secure genetic autonomy. Work-

shop participants described “genetic autonomy” as the ability of individuals or groups to control when, where, how and by whom their genetic information is used. To this end, it is critical that additional resources and support are provided for Indigenous peoples seeking training in genomic sciences.

Workshop discussions also highlighted some of the complexities of identity (or identities), as well as the meaning and importance of “indigenous identity” in different geographic and sociopolitical contexts, including the United States, Canada, Mexico, Brazil and Australia. For example, Jessica Bardill and Edwardo Swartz-Marin led a discussion that highlighted how countries vary widely in how genetic information is gathered, interpreted, controlled and disseminated, as well as the use and stakes of genetic information.

Another key point of discussion at the workshop focused on clarifying misconceptions about DNA and genetic testing. A growing number of Native American tribes, especially in the United States, are turning to genetic parentage tests to inform tribal enrollment decisions, but there is much uncertainty among many tribal members about the exact purpose of these tests and how they differ from genetic ancestry tests. Participants probed the contrast between the lived experience of being a tribal member and genetic gatekeeping to tribal membership.

Finally, there was a strong consensus among workshop participants of the need to contextualize the results of genetic research, particularly when working with Indigenous communities. By presenting genetic information alongside other ways of interpreting the past, such as oral histories and archaeology, a more holistic, complete and dynamic interpretation of identities—past and present—may be realized. Contextualization was a key takeaway from the workshop and symposium.

Ultimately, genetics and ancient DNA analysis should be considered alongside other ways of understanding the identities of ancient and modern-day peoples. “Genetic identity,” it was agreed, should be considered as a supplementary source or a last resort when all other information has been considered. For example, if there is no information on the geographic provenance or cultural affiliation of human remains, then DNA analysis may provide insight into genetic relatedness *at a general level*. Even then, results need to be considered cautiously as genetic similarities do not necessarily equate with cultural relatedness, and vice versa.

Proposed workshop outputs include this symposium proceedings volume and other publications, a travelling exhibit on “DNA and Indigeneity,” appropriate in size for tribal colleges, and a website housing a diverse assortment of resources. Videos of the symposium presentations are already available on the [IPinCH website](#).

Financial support for the event was provided by IPinCH, the Social Sciences and Humanities Research Council (SSHRC) and by Simon Fraser University.



DNA AND INDIGENITY WORKSHOP PROGRAM

Session 1: *DNA and the Repatriation of Human Remains* (Discussion Leaders: Susan Rowley and Dorothy Lippert)

Assigned Readings

- Kakaliouras, Ann M.
2012 An Anthropology of Repatriation: Contemporary Physical Anthropological and Native American Ontologies of Practice. *Current Anthropology* 53:S210.
- Mulligan, Connie J.
2006 Anthropological Applications of Ancient DNA: Problems and Prospects. *American Antiquity* 71(2): 365-380.
- TallBear, Kimberly
2003 Blood and Racializing the Tribe. *Wicazo Sa Review* 18(1): 81-107.

Session 2 – *Land and Identity-Based Rights* (Discussion Leaders: David Schaepe and Sara Juengst)

Assigned Readings

- Cui, Yinqi, John Lindo, Cris E. Hughes, Jesse W. Johnson, Alvaro G. Hernandez, Brian M. Kemp, Jian Ma, Ryan Cunningham, Barbara Petzelt, Joycelyn Mitchell, David Archer, Jerome S. Cybulski, Ripan S. Malhi
2013 Ancient DNA Analysis of Mid-Holocene Individuals from the Northwest Coast of North America Reveals Different Evolutionary Paths for Mitogenomes. *PLOS One* 8(7): e66948.

- Kent, Michael
2013 The Importance of Being Uros: Indigenous Identity Politics in the Genomic Age. *Social Studies of Science* 43(4): 534-556.
- Smith, Silvia E., M. Geoffrey Hayes, Graciela S. Cabana, Chad Huff, Joan Brenner Coltrain, and Dennis H. O'Rourke
2009 Inferring Population Continuity Versus Replacement with aDNA: A Cautionary Tale from the Aleutian Islands. *Human Biology* 81(4): 407-426.

Session Three – *Biogenetic Identities and Tribal Belongings* (Jessica Bardill and Ernesto Schwartz-Marin)

Assigned Readings

- Bardill, Jessica
2014 Native American DNA: Ethical, Legal, and Social Implications of an Evolving Concept. *Annual Review of Anthropology* 43:155-166.
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Session Four – *Working at the Crossroads of Genetics, Biology, and Identity: Developing Tools for Researchers, Communities, and Other Stakeholders* (Discussion Leader: George Nicholas)

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2014 Late Pleistocene Human Skeleton and mtDNA Link Paleoamericans and Modern Native Americans. *Science* 344(6185): 750–754.

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2014 Equitable Access to Human Biological Resources in Developing Countries: Benefit Sharing Without Undue Inducement. Ph.D. Dissertation, School of Health, University of Central Lancashire, Lancashire, UK. <http://bit.ly/1rfkYMC>

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