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Traditional Laws Meet Emerging Biotechnologies: The Impact of Genetic Genealogy on Indigenous Land Title in Australia

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The increasing popularity and availability of genetic testing has the potential to play into debates surrounding forms of Aboriginal and Torres Strait Islander land ownership known as "native title." This paper draws on research with applied anthropologists working in native title, and a review of descriptions of native title holders in existing determinations, to address three key questions: Are native title holders and claimants interested in using genetic genealogy for claiming native title or resolving membership disputes? If so, can this biotechnology offer them the kind of information they seek? And finally, does the legal framework allow or support its use for these purposes? Our findings highlight the importance of disseminating current information about genetic genealogy among Indigenous Australians and having frank conversations about the opportunities and limits of genetic technologies in this context.

Key words: Indigenous, land claims, genetics, Australia, native title

Introduction

On November 8, 2017, the second author of this paper received an unexpected email. It was sent by a lawyer representing three Indigenous citizens of the Australian state of Queensland. They had been dismissed from their roles as cultural officers in the Barada Barna Indigenous Corporation (BBIC) a year earlier. All three were members of one family, who'd been active in the Barada Barna people's campaign to claim their ancestral lands under the *Native Title Act*, 1993 (Cth). Shortly after the claim succeeded in 2016, the board of BBIC, the Registered Native Title Body Corporate (RNTBC)[1] set up to hold and manage the group's native title, suspended their family's membership—claiming they'd failed to provide evidence of their biological connection to the Barada Barna people. Because group membership was an "inherent requirement" of the cultural officer role, the three were also dismissed from their positions (*Roos v. Winnaa Pty Ltd*, FWC 3568 [2018]).

The key questions in the Fair Work Commission case that followed revolved around the origins of the aggrieved family's ancestor, Kitchener Brown. Authorities had removed Kitchener from Barada Barna land in 1908, along with Barada Barna children that he referred to as his "brothers." A century later, the descendants of these brothers oversaw the return of Kitchener's remains to Barada Barna land (Hamilton 2008). However, following the successful native title claim, these presumed relatives changed their position—arguing that Kitchener was in fact an adopted, rather than biological, brother. This means Kitchener's ancestors did not meet the strict RNTBC membership rules, based on the group's description in their native title determination. To prove otherwise, the Board members had called on Kitchener's descendants to take DNA tests. They refused, stating the request was "offensive and culturally inappropriate" (personal communication).

This is where the second author, a medical and cultural anthropologist who has researched the use of genetics in Aboriginal communities since 2007, came in. She was asked to provide an expert testimony about the cultural basis of this refusal and whether it was theoretically possible to demonstrate a biological connection between Kitchener's descendants and their presumed Barada Barna relatives through DNA testing. Ultimately, the testimony was not decisive in the case. The Commissioners found in favor of Kitchener's family, arguing that the RNTBC did not truly believe they were not rightful members at the time of their dismissal, as their membership had been suspended but not cancelled (*Fair Work Commission v. Winnaa Pty Ltd*, FWC 3568, C2017/371 [2018]). But the request for expert testimony itself raises broader questions. While there have been informal calls by Aboriginal people to "prove" their identity through DNA tests (Bevilacqua 2002;

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Noble 2015; Wood 2002), this is the first time (to our knowledge) that such a request has been recorded in a legal case. Is this a sign of things to come? Will the increased availability of genetic ancestry testing in Australia affect Aboriginal people's access to native title rights in the future?

In this paper, we address these two broad questions through three smaller ones: Are native title holders and claimants interested in using genetic genealogy for claiming native title or resolving membership disputes? If so, can this biotechnology offer them the kind of information they seek? And does the legal framework allow or support its use for these purposes? To answer these social, scientific, and legal questions, we draw on two primary data sources: a survey of forty anthropologists working in native title and a review of descriptions of native title holders—descriptions that provide the basis for RNTBC membership rules—in 213 of the existing 347 native title determinations.

Combining and supplementing these two datasets, we offer some insight into the future use of genetics in Aboriginal land claims. Our research suggests that, while there is some interest in using genealogical DNA tests to prove native title, the hopes upon which this interest is built are generally misguided. It is highly unlikely that genealogical genetics will offer proof of descent from the original owners for specific regions, and such evidence is not in fact required by courts. But there is a greater—and growing—interest in using these tests to resolve membership disputes, and the scientific and legal scope for this application is potentially much greater. Genetic kinship tests are able to establish biological relationships between living people with increasing precision, and the descriptions of native title holders in Federal Court determinations increasingly contain lists of "apical ancestors"[2] (similar to the "base roles"[3] of Native American tribes).

Our anthropological informants argued that the increasing reliance on apical ancestor lists in native title determinations, translated into RNTBC membership rules interpreted as requiring biological descent, reflects a growing emphasis on "bloodlines" in Aboriginal society. This impression is echoed in anthropological scholarship on the effects of native title and colonization more generally (Babidge 2010; Correy 2006; Dauth 2011; Martin 2012; Povinelli 2006; Tonkinson 1990). Ethnographic research suggests this shift particularly applies to Aboriginal groups in more urbanised areas, whose social organization has been most affected by colonization. These findings demonstrate the importance of disseminating current information about genetic genealogy among Indigenous Australians and having frank conversations about the implications of proceeding down the genetic path. They also make an important contribution to the literature on the changing nature of Indigenous land ownership systems.

Dual Revolutions: The Rise of Descent in Native Title

In hindsight, we can see that the emerging use of genetics in native title is the ultimate outcome of two "revolutions" that both occurred in the 1990s. In 1992, Australia witnessed a "judicial revolution" (Hinchman and Hinchman 1998), which meant that Indigenous customary land ownership—ignored since the British colonized in 1788—was recognized for the first time by the common law in the High Court's *Mabo & Ors No.2* (1992) ruling. Prior to that point, Aboriginal Australians had to rely on state and federal governments to grant them lands through "land rights" schemes.[5] The *Native Title Act*, 1993 (Cth) provides Indigenous groups a statutory framework for claiming rights and interests in relation to lands and waters, provided they could show that the laws and customs under which those rights and interests are possessed are "traditional," meaning pre-colonial in origin, and have not been extinguished by subsequent acts of government. A subsequent High Court case defined "traditional" as necessitating that "laws and customs must have continued substantially uninterrupted since sovereignty" (*Members of the Yorta Yorta Indigenous Community v. State of Victoria & Ors*, M128 [2002]). Groups who pass this "continuity test" are obliged to establish or nominate a corporation as their RNTBC, to hold and/or manage their native title.

At the same time, another revolution was occurring—this one biotechnological. An international consortium of researchers was working to map the human genome. The knowledge generated by this project soon began feeding into social and political conversations across the globe, including the growing debate surrounding Indigenous land claims. Indigenous-identifying groups—such as the Uros and Tainos in South America and the Khoesan in South Africa (Curet 2015; Kent 2012; Schramm 2016)—sought to use genetic information about the geographic origins of their ancestors in campaigns for state recognition. In the United States, where a booming direct-to-consumer industry developed shortly after the completion of the Human Genome Project in 2003, those seeking to join recognized Native American land-holding tribal councils also began to use these "bio-geographical ancestry tests" (Golbeck and Roth 2012). While tribal councils have so far rejected the results of these contentious tests, many have begun using "kinship tests" (showing the biological relationships between individuals) to uphold their lineal descent rules (TallBear 2003).

These international developments have generated a body of scholarship exploring the legal and scientific factors that enable and prevent the use of genetics in individual and group Indigenous title claims, as well as the social reasons for, and implications of, this technological application (Golbeck and Roth 2012; Nelson 2016; TallBear 2013). However, in the Australian context, these debates have been forestalled. In the late 1990s, the Australian Law Reform Commission (ALRC) raised the issue of native title in the course of their inquiry into the social, ethical, and legal impacts of consumer genetics. The ALRC hypothesized that DNA tests would be of little use to those seeking to prove their descent from original native title holders but could potentially be used to determine membership of established native title claim groups in some circumstances.

The ALRC's tentative conclusions were questioned in subsequent submissions. Representatives from Indigenous and non-Indigenous organizations drew on classical ethnographies to argue that Indigenous kinship is a social, rather than biological, phenomenon. Anthropologists argued that, in Aboriginal Australia, rights to land gained through descent require recognition by the jural public (Sutton 2003) and need to be "activated" through the acquisition of knowledge and participation in ceremony before a person could be said to "speak for" or be "boss for" an area (Sutton 2001; Williams 1986). Others are also said to have a "half-say" in the land (Trigger 2015b), having gained "secondary" rights through, for example, matrilineal links, birth, conception, or the burial of close kin on the land, as well as ceremonial, marriage, language, totemic links, and religious connections (Peterson, Keen, and Sansom 1977). These secondary owners could become "boss" for land through adoption or succession (Sutton 2003; Trigger 2015b).

In submissions to the ALRC, these empirical arguments about the nature of Indigenous society were fused with normative claims against Indigenous genetics—echoing contemporary leaders' concerns about bio-piracy, racialization, and stigmatization (Aboriginal and Torres Strait Islander Social Justice Commissioner 2002). "Under no circumstances," one national Aboriginal organization argued, should genetic testing "be used in relation to native title" (AIATSIS 2001). Unsurprisingly, the ALRC (2003) did not reiterate their initial hypotheses in their final report, instead encompassing the subject of native title within a general argument about the social nature of Indigenous kinship. Responding to concerns that genetics *should not* be used in native title, the question of how it *could* be used was effectively deferred.

For the next fifteen years, this report remained the final word on the impact of genetics on native title in Australia. Yet, over this time, the political and biotechnological context has changed significantly. Indigenous opposition to genetic research has largely been eclipsed by concerns about potential exclusion from the benefits of "personalized" medicine (Kowal 2012). Evolutionary geneticists have also sequenced hundreds of new and existing Indigenous samples over the last decade, with the consent of Indigenous individuals and their descendants, and the resulting research has affirmed their deep history in Australia and their ancient links to particular regions (Malaspinas et al. 2016; Tobler et al. 2017). In the last few years, direct-to-consumer companies from the United States, such as 23andme and AncestryDNA, have also begun marketing their products directly to Australia.

At the same time, ethnographers suggest that Indigenous society is moving in a direction that makes the use of genetic ancestry information in a native title context more likely. The work of applied anthropologists—largely overlooked in submissions to the ALRC review—suggests that disputes about biological and geographic boundaries are endemic to the native title process (Smith and Finlayson 1997). While some claim contests over land have a deep history in Indigenous societies (Morton 1997), most agree they have grown in number and intensity since "the material and symbolic stakes have been raised" (Edmunds, 1994:39) by land rights and native title. As Palmer points out, the number of overlapping native title claims is significant and growing. Forty-five percent of claims overlapped in 2007, some involving more than five competing claims, and this rose to 56 percent by 2017 (Palmer, 2018: 191). He suggests that disputes have arisen "as individuals become more aware of their rights, have gained access to pro bono legal advice and have gained a better understanding of the potential benefits of being an unambiguous member of the claimant group" (Palmer 2018:193).

As these disputes play out in Australia's adversarial legal system, ethnographers argue, Indigenous systems are moving from more fluid and contextual characterisations of group membership towards a reliance on lineal descent rules (Babidge 2010; Correy 2006; Dauth 2011; Martin 2012). In the past in New South Wales, Correy (2006:340) claims, "The dogma of descent was largely absent from public discourse"; however, the state's desire to identify the native title holders has transformed local practices, and membership discussions are now "dominated by attempts to demarcate certain ancestral relationships." Similarly, Babidge (2010:127) recorded Queenslanders lamenting that before "all this native title business, no-one cared about which family you came from."

While commentators suggest that this shift towards descent has been greatest in arable areas, changes have also been observed in areas where classical Indigenous land ownership systems have survived in relative isolation. Wilmot and Morgan (2010) highlight this shift in the Arrernte context in Central Australia, after members of the diaspora began attending meetings about their ancestral land. Many asserted their right to speak by wielding genealogies instead of deferring to elders whose seniority was based on their *tywerrenge* (knowledge of sacred songs, ceremony, and land). Looking for objective criteria to exclude this group, who were causing disruption and conflict, elders limited the meeting attendees to direct descendants of their grandparents. While having the intended effect, these new rules also led to the exclusion of previous attendees with connections to land based on their tywerrenge rather than descent. The loss of this detailed knowledge amongst the younger generation, Wilmot and Morgan (2010:170) muse, "may mean that genealogies are used in much the same way as tywerrenge were in the past."

Gauging Interest in Genetic Testing in the Native Title Context: Surveys and Interviews with Native Title Anthropologists

These works of contemporary, applied anthropology paint a different picture of native title claimant and holder groups than the submissions of the ALRC review, suggesting that many are moving in a direction that would make the use of genetics increasingly more likely. To investigate whether the shifts outlined above have manifested in an increased interest in genetics, we surveyed forty applied anthropologists between December 2017 and October 2018.[6] Most were

contacted through the Australian National University's Centre for Native Title Anthropology's mailing list.[7] Additional surveys were completed by participants at a workshop on genetics and native title the co-authors convened at the request of a Native Title Representative Body in Western Australia.[8]

The respondents were highly experienced native title practitioners: twenty-six had worked in the field for more than ten years, and together, they had worked on cases in every Australian state and territory except Tasmania.[9] Participants were asked if they were aware of, or anticipated, Indigenous people trying to use genetic/genomic information as proof of native title or as evidence in membership disputes. We supplemented the survey results with seven extended interviews with survey recipients who reported the most experience with the topic.

Only six anthropologists of the forty (15%) had encountered Indigenous people with an interest in using genetics to support their group's native title claims. Most of these interested people hoped that biogeographical ancestry tests would demonstrate links to their ancestral lands. One anthropologist who'd worked in Queensland and Western Australia reported that "there is an understanding from people that genetic testing can prove the exact location in Australia that their ancestors came from." Another who'd worked in Queensland reported that some of their Aboriginal informants had participated in genetic studies and believed that these results "showed that they 'belong' to a particular region of Australia." A third anthropologist surmised: "There are a range of misconceptions about genetic testing that center around it being able to provide geographical origin information." A fourth stated: "I believe people are considering this technology, but I doubt that it will give them the answer they want, that is, connection to a specific place within Australia."

Two more anthropologists encountered Indigenous people hoping to use genetics to prove native title in different ways. One group from Western Australia wanted to use biogeographical ancestry testing to prove their Dutch, rather than Aboriginal, ancestry. They believed DNA tests, conducted with the support of an amateur Dutch-Australian historian (Strutt 2010), demonstrated their descent from the 200 mariners who reportedly intermarried with the local Indigenous groups after being shipwrecked off the mid-west coast in the 17th century (Laurie 2016). The results which purportedly showed "Western European" as well as "British" admixture, demonstrated their descent from those living in the area when the Dutch arrived. Another anthropologist reported that, in the late 1990s/early 2000s, there were suggestions of, literally, "digging up potential ancestors to prove or disprove individual claims."

While our surveys suggest there is only minor interest in using DNA tests to prove native title, the interest in using genetic technology to resolve membership claims was much greater. Twenty-seven anthropologists (67.5% surveyed) had encountered Indigenous people who hoped to use genetics to resolve membership disputes—which often involve conflicts over who people's forebears are and the country those in question are thus connected to. "I have worked with several claimant groups who believe that genetic information will resolve intra-Indigenous disputes," one anthropologist from Western Australia noted. A second ethnographer described receiving this kind of enquiry "six or seven" times a year. Others spoke of people attempting to use genetics to gain entry to existing groups. For example, one was approached by someone wanting "genetic testing to 'confirm' their inclusion in native title claims," and another working in Western Australia described "two brothers who, on learning of their Indigenous great-grandmother, were genetically tested and asked to join the [Aboriginal group] Native Title Claim." Others had encountered people seeking to use genetics to exclude existing members of their native title group. For example, one anthropologist stated: "I am aware of a group of people who intend to use genetic information in support of their native title claim but more to exclude other individuals rather than to prove their own connection."

Some of our anthropological informants noted that, as of yet, this interest has not translated into the actual use of DNA tests. "In my experience, the possibility of people taking DNA tests to prove 'right people for country' is regularly canvassed, but I am not aware of anybody actually resorting to tests or taking active steps towards doing so." "I have heard people make passing comments about this as an idea, but so far it never seemed serious," another pointed out. A third noted, "It is an idea that has been and might more often be thrown about. But I would not anticipate actual use in the immediate future in claims I am aware of." These comments all highlight a gap between some Aboriginal participants' current perceptions of the utility of DNA testing, or hopes that it may hold "the answers," and anthropologists' understandings of the limitations of applying existing technologies in native title legal contexts.

Our informants indicated that using genetics in the native title context is, thus far, largely hypothetical. But given the apparently widespread interest in the possibility, it's important to address the scientific and legal factors that determine whether genetics *could* be used as evidence for inclusion in a native title claim or in the membership of a group. The following section will look at the possibilities made available through the rapidly developing field of genetic genealogy. In the context of this article, we aim to provide a basic overview of the potential uses and limits of genetic testing for native title purposes. Note that this information is correct at the time of writing; however, future readers should be aware that changes in this field of research or in the commercial industry may have occurred.

The Scope and Limits of Genetic Genealogy

There are two broad types of genealogical DNA tests: uniparental tests and autosomal tests. Each provides different information about a person's biological relationships and biogeographical origin. Uniparental tests focus on DNA that is inherited directly from one parent, rather than being

recombined in every generation. This includes Y-chromosome DNA (Y-DNA), which is passed from a father to his biological sons, and mitochondrial DNA (mtDNA), which is passed from a mother to all her biological children. The pattern of inheritance means that Y-DNA and mtDNA sequences are shared by all descendants along the direct paternal and maternal lines (respectively), marking them as a particular "haplogroup" or lineage of the phylogenetic tree stretching back tens of thousands of years. Uniparental tests can therefore offer insight into one's "deep ancestry"—a fact that has been seized upon since the late 1990s, when entrepreneurial researchers began offering British people the chance to discover Viking ancestry or determine which of the "seven daughters of Eve" they descended from (Sykes 2001). Because some haplogroups are only found in Indigenous Australians, mtDNA and Y-chromosome tests can provide information about an Indigenous ancestor in the direct maternal or paternal line and may reveal previously unknown ancestry (Watt, Kowal, and Lehmann 2018); however, this pattern of inheritance also means that mtDNA and Y-chromosome tests do not provide information about all the ancestors who are not related along direct maternal or paternal lines.

Despite these limitations, uniparental DNA has been proffered as a tool in Indigenous land claims in Puerto Rico, Peru (Kent 2012), South Africa (Schramm 2016), and British Columbia (Cui et al. 2013). Similar attempts to use DNA in land claims in Australia have been affected by the dearth of genetic data available; however, with recent research projects such as the University of Adelaide's Aboriginal Heritage Project, questions about the use of mtDNA tests for native title have arisen (Browning 2016). Yet, as the Adelaide University team points out in their Frequently Asked Questions, while mtDNA mapping may link people to a region—such as south-western Western Australia—it does not offer the resolution required in native title claims: "The genetic lineages are generally present across wide geographic areas, at different frequencies, and so cannot resolve local issues at which land claims operate," they highlight, stressing "the genetic results are not produced at a level suitable for legal use" (Australian Centre for Ancient DNA 2016).

MtDNA and Y-chromosome testing can also be used to test the biological relationships between two people and thus could be used in the context of membership disputes. But these tests only work if those people are related through a direct maternal or paternal line, and, even if two people share the same mtDNA and Y-chromosome haplogroup, this does not indicate how closely related they are.

"Autosomes" is the term geneticists use to describe the twenty-two pairs of chromosomes that are equally inherited from both biological parents. In the last decade, companies have been offering genetic testing of a million or more single points across the autosomes (Single Nucleotide Polymorphisms or SNPs) and comparing these to reference data owned by the company to provide estimates of bio-geographical ancestry expressed as percentages. The utility of these tests is limited by both the size of the database held by any particular company and the relevance of that company's data to the consumer. There is currently either no data, or very limited data, from Indigenous Australians in the databases of genetic testing companies. If there is no reference data from the correct group, the formulas that companies use will match a consumer's DNA with the most closely genetically-related group in their database. For example, Ancestry DNA, whose 10 million sample database is the world's largest, provides the following disclaimer on its Australian website: "Ancestry's current genetic ethnicity estimate does not provide a direct estimate of Indigenous Australian Ethnicity. Should someone with Indigenous Australian ancestry take an AncestryDNA test, the resulting genetic ethnicity estimate is most likely to include South East Asia and Oceania." Even if a future test more accurately identifies Indigenous ancestry, this would not provide the specificity required for native title purposes.

A genetic service that is potentially more relevant to native title is testing that estimates the genetic relationship between two people.[10] Approximately 50 percent of autosomal DNA is shared with first-degree relatives (biological parents, full siblings, and children), approximately 25 percent with second-degree relatives (half-siblings, grandparents, aunts, and uncles), and so on. A person shares less than 1 percent of DNA with a third cousin, and this amount can vary between 2 percent and close to 0 percent. Therefore, genetic testing is useful for confirming biological relationships between close relatives and less reliable for confirming relationships between distant relatives. Distant relatives may share no DNA, even though they are still related.

Another factor that makes autosomal genetic testing difficult to interpret is that people from the same ethnic group can share DNA without being directly related through a recent common ancestor. For example, due to cultural practices of marrying within the ethnic group, two Ashkenazi people will commonly share a small amount of DNA even if they know they do not share any ancestors on their family trees (Mendelsohn 2017). Indigenous Australian groups may have the same issue. Due to marrying within the group and between neighboring groups over a long period, Indigenous Australians may share DNA with other people in the group or the region even if they don't have recent common ancestors. These factors limit the current usefulness of genetic ancestry tests for native title, except in cases where they are used to confirm genetic relationships between close biological relatives.

Legal Scope and Limitation

Even if Indigenous individuals and groups *did* have a desire to use genetic testing in relation to native title claims or RNTBC membership, and genetic testing *could* be used to establish biological descent from the original owners of a particular tract of land or establish a biological relationship to a particular group, the question remains: would these be accepted within the current legal system? To consider this question, we need to consider both the "evolving law of native

title" (French 2004) and the legal factors framing membership disputes before, during, and after a native title claim.

Native title claimants' interest in genetic testing is unsurprising when we consider the emphasis on biological descent in early jurisprudence. In the seminal *Mabo* ruling, Justice Brennan described membership of the native title claimant group as depending on "biological descent from the Indigenous people and on mutual recognition of a particular person's membership by that person and by the elders or other persons enjoying traditional authority among those people" (*Mabo v. Queensland*, No. 2 [1992]). A year later, a New South Wales court interpreted this statement as meaning that "there must be evidence that the claimant is an Indigenous person and biological descendant of the Indigenous clan or group who exercised traditional customary rights in respect of the land when the Crown first asserted its sovereignty" (*Mason v. Tritton*, 6 BPR 13639 [1993:586]). Federal Court Justice Olney made a similar interpretation in the early, high-profile *Yorta Yorta* native title trial. He called on claimants to "identify one or more persons who occupied the relevant area at or prior to 1788 [the year of British colonization]" and establish that "one or more of the claimant group is a descendant of such ancestor or ancestors" (*Yorta Yorta v. Victoria* [1998:51]).

Yet, the evolving "rules of recognition" (French 2004:91) have since challenged this emphasis on biological descent. The judges' approach in *Mason v. Tritton* was questioned in the NSW Court of Appeal when Justice Kirby highlighted the enormous evidentiary burden that the descent requirement placed on Indigenous people, especially given the "many deprivations and disadvantages following European settlement of Australia and the limited record keeping of the earliest days" (*Mason v. Tritton*, 34 NSWLR 572 [1994]). In *Ward v. Western Australia* (1478 FCA [1998]), the Federal Court went further, questioning whether strict biological descent was even necessary to claim native title. The court found that Brennan's reference to "biological descent" involved "a broad understanding of descent, not the application of a narrow, and exclusive test" (*Ward v. Western Australia*, 1478 FCA [1998]). Justice O'Loughlin reinforced this point, pointing out that the *Native Title Act*, 1993 (Cth) makes no reference to descent and arguing that the "lack of biological or adoptive descent does not therefore create a problem in an application for determination of native title if a particular person can show that he or she is a member of the claimant group by virtue of the traditional laws acknowledged and traditional customs observed by that group" (*Ngalakan People v. Northern Territory*, FCA 654 [2001]).

Young QC highlighted this juridical change in the 2001 *Yorta Yorta* appeal, pointing out that "the law…has now accepted on a number of occasions that strict biological descent is not the only mode of proving matters. You can prove the necessary connection under traditional laws or customs that may go wider than a biological connection" (*Members of the Yorta Yorta Indigenous Community v. State of Victoria & Ors*, M128 [2002]). Thus, it seems that even if it *was* possible to find DNA evidence of a biological link between living people and the relevant traditional owners at the time of colonization, this evidence would not necessarily carry weight in Australian courts, where the focus is on the continuation of the traditional laws and customs which underpin rights in land, rather than chromosomes.

Yet, while the Australian judiciary may have moved away from an emphasis on descent as the basis of land claims, commentators suggest that other aspects of the native title system have placed increasing pressure on Indigenous groups to define themselves in biological terms (Correy 2006; Dauth 2011; Gover 2010a). In particular, they highlight the effects of the conservative Howard Government's *Native Title Amendment Act 1998*, which requires native title claimants pass a "registration test" before they can be heard in court. Among other things, this test requires native title claimant groups to identify themselves "objectively," and "sufficiently clearly so that it can be ascertained whether any particular person is one of those persons" (*Native Title Act*, 1993 [Cth]: s190A[3]). As Gover (2010b:160) points out, these requirements discourage rules "permitting a high degree of discretion in the selection of members, and those that allow the modification of a person's status over the course of their lifetime, due to changes in residency, marriage, or their observance of laws and customs." Therefore, despite the "potential for flexibility in group description under the NTA," Dauth (2011:24) notes, "the prudent legal response to the 1998 amendments has for the most part favoured a model of neatly bound and inflexible corporate groups."

Applied anthropologists suggest that these requirements have compounded the other social and legal factors discussed earlier in this paper (namely the declining knowledge of the more complex, classical systems of land ownership and the increase in land-related conflicts) to elevate the role that genealogies and "bloodlines" play in Indigenous membership disputes. This shift has been highlighted with reference to the 2010 "Minnie case," which followed after the diasporic descendants of a woman who was born in the Gulf of Carpentaria in the late 19th century sought to join the Waanyi native title claim (Martin 2012; Trigger 2015b). Recognized Waanyi people rejected the claim, Martin explains, because they had difficulty placing the "Minnie mob" within recognized family groups and were sceptical about their motives for re-joining the group. As the dispute intensified, the recognized Waanyi increasingly relied on the genealogies collected by anthropologists in the 1980s to justify the exclusion, demonstrating how "land and native title claims processes have tended to rigidify orally transmitted knowledge" (Martin 2012:216).

The conflict eventually had a hearing in the Federal Court, after the "Minnie mob" acted as respondents in the Waanyi native title claim (*Aplin on behalf of the Waanyi Peoples v. Queensland*). Considering the evidence of two senior Indigenous people who knew Minnie, Justice Dowsett concluded that she had identified as Waanyi throughout her life. But these "factual findings" about Minnie's ancestry were not determinative in the case, as Dowsett concluded the key question was "whether the present Waanyi people accept that Minnie was a Waanyi person"—which, it appeared, they did not. Reflecting

on this decision as it related to questions of ancestry and rights to country, expert witness David Trigger (2015a:212) concludes:

> Ultimately, it may not be the expert anthropologist's report nor necessarily even the judge's decision which resolves the matter in any final way. It will be the extent to which particular claim groups decide over time to emphasize inclusivity rather than exclusivity of membership that will drive the outcomes and the procedures adopted to achieve them.

Given the deciding role of claim groups in recognizing potential members' rights to country, it's difficult to predict whether or not genetic testing could be used by those seeking to join, or to expel someone from, a native title claim group. However, once such claims are successful, the legal situation changes in important ways. The description of the group is agreed on by the claimants, their lawyers, and the relevant state or territory in mediated cases and then "formalized and concretised by the Court" (Correy 2006:24). Because the resulting RNTBCs are bound to develop their membership rules based on their traditional laws and customs as outlined to the Federal Court, Gover (2010b:174) notes, the "human boundaries of native title-holding communities are legally fixed by native title determinations."[11] At this point, Dauth (2011:21) points out, descriptions of groups are "in effect, frozen in time."

Given the importance of native title holder descriptions in determinations, we decided to build on Gover's (2010b) comparative work and review the 347 positive determinations made between 1992 and October 2018. Excluding repeat claims and those where the description of the native title holders was not clear, our final sample was 213 descriptions, including sixty claims from mainland Queensland, twenty-two from the Torres Strait, nine from New South Wales, fifty-eight from the Northern Territory, eighteen from South Australia, one from Victoria, and forty-five from Western Australia. We analyzed the role that descent has played in these descriptions over time and considered how these factors might promote or prohibit the use of genetics in this domain.

The results of this review corroborated earlier accounts, suggesting that the 1998 Native Title Act Amendments had an important effect on group definitions. Only eighteen of the 213 determinations in the study described the native title holders in loose, vague terms, as a "people" or "clan," and all but two of this group of cases were before 2000. In most of these early determinations, the native title holding group was also awarded the right to decide their own membership. Since the turn of the 21st century, however, descriptions of native title holders have become far more elaborate and prescriptive, and—in the majority of cases—included descent-based criteria. In all but five of the remaining 195, descent formed the "backbone" (Gover 2010b) of the native title holder descriptions.

The shift towards descent criteria as a way of defining native title holding groups suggests that genetics could play a significant role in RNTBC membership disputes. Yet, we suggest that the impact would in fact vary greatly because of the differing ways descent rules are described, qualified, and supplemented across the country. While descent-based descriptions have been adopted across the board since 2000, we found that groups in the Northern Territory, South Australia, and Western Australia tended to define relevant ancestors in broad terms—usually as the members of landholding or language-owning groups. Groups from these areas also tended to outline a number of pathways to group membership other than descent—not only adoption, but also connections through religious affiliation, ceremonial participation, spiritual or secular knowledge of the country, marriage, or the site of one's conception, birth, childhood, or initiation. A considerable minority also qualified their descent descriptions, requiring that a person be recognized by other members and/or have a connection to the land and waters, in addition to fulfilling the descent criterion.

By contrast, the vast majority of determinations from New South Wales, Victoria, and Queensland specified that members should descend from named "apical ancestors." The use of these "apical ancestor" lists, which function in essentially the same way as the "base roles" used by most Native American tribes, make the use of genetics more likely (around fifty Native American tribes use genetics to qualify biological relationships [TallBear and Bolnick 2004]). The groups who used apical ancestors were also less likely to make exceptions for non-descendent members or require additional factors beyond descent, such as connection to land.

Conclusion

Submissions to the 2003 review of genetics by the Australian Law Reform Commission stressed the fact that Indigenous kinship is a social rather than a biological phenomenon. "Indigenous customary law does not rely on linear proof of descent in the Judeo-Christian genealogical form of 'Seth begat Enosh begat Kenan' in order to prove membership of the group," the submission of Aboriginal and Torres Strait Islander Social Justice Commissioner highlighted. The South Australia Department of Social Services went on to stress that "Western notions of 'biological' family and kinship should not become the benchmark for the determination of what constitutes family and kin in the Aboriginal context." However, our research indicates that, faced with the legal and corporate requirements of the native title system, some Indigenous people and groups today are falling back on notions of biological kinship to clearly define themselves. These modern understandings contrast with classical sociospiritual notions of kinship, under which a person's status as "belonging" or otherwise is a matter determined by the jural public of those with cultural authority, such as a loose constellation of regional elders. While the Australian judiciary is inclined not to equate indigeneity with biological descent, other factors of the native title system are encouraging a shift towards group definitions grounded in biological descent, most prominently in the eastern states of Australia.

Importantly, we have outlined significant scientific barriers to the use of genetic testing in native title, although some forms may be used to confirm close biological relationships. Despite this, our survey of native title anthropologists indicates that many native title claimants are interested in genetic testing. Cases where genetic testing is invoked, like the one we discussed in the opening of this paper, are likely to become more common. This suggests a need for those who work in native title to familiarize themselves with the principles—and especially the limits—of genetic testing, as it is quite possible they will encounter Indigenous people who seek to use these tests for various purposes, particularly those who work with groups in eastern Australia. This task would be aided greatly if native title organizations develop policies on genetic testing, and we hope this article assists in that process.

Notes

[1]The *Native Title Act* requires native title holders to nominate a corporation to hold or manage their native title. Technically, once the resulting corporation is registered, it becomes a "Registered Native Title Body Corporate."

[2]In anthropology, an apical ancestor is a common ancestor from whom a lineage or clan may trace its descent. The term has become used in native title anthropology as shorthand for selected named forebears whom it may be convenient to describe a group's current composition by reference to (see relevant discussion in Morton 2017).

[3]To become a member of most Native American tribes, individuals must prove they are direct descendants of those recorded during the tribal census taking that followed the Allotment Act of 1887.

[4]Related to this, but beyond the scope of this paper, are debates about the extent of this "shift" and the extent to which emphasis on "bloodlines" is new (see Morton 2017).

[5]The Federal government introduced a land rights scheme in the Northern Territory: the sparsely-populated, arid, and tropical areas in the "remote" north and west of the continent where the Commonwealth retained the right to legislate. Following the passing of the *Land Rights Act* (Northern Territory) in 1976, 47 percent of the land in the NT was given back to traditional owners, provided they could prove their pre-colonial claim to their lands to the Aboriginal Land Commission (ALRC 2015).

[6]Forty-seven total responses were received. Of those who responded, forty were anthropologists, five were lawyers, one was a bureaucrat, and one was an archaeologist. Only the forty responses from anthropologists are considered here, as this group is most relevant to the questions asked in this paper.

[7]Note that we did not seek to gain a representative sample, and we recognize that those anthropologists who had not experienced any enquiries about genetics would have been less likely to complete the survey. While the results are not representative, we believe they are still useful for evaluating the current situation and planning for a potential increase in the use of genetics in native title.

[8]To properly gauge understandings of, and attitudes towards, genetics among native title holders or claimant groups, extended fieldwork would be required. The information from native title anthropologists utilized here provides a useful starting point for further research on this topic.

[9]To date, no native title application has been successful in Tasmania, and there are no active applications there at present.

[10]This service is also part of some ancestry estimation tests as a "relative finding" platform where customers are shown their genetic matches with other customers and can seek to contact them.

[11]Note that groups can change their determination but only through a lengthy legal process.

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