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The role of radiocarbon dating in advancing Indigenous-led archaeological research agendas

Jennifer Birch[1✉], Turner W. Hunt[2], Louis Lesage[3], Jean-Francois Richard[3], Linda A. Sioui[3] & Victor D. Thompson[1]

Meaningful collaborations between archaeologists and descendant communities and nations is a necessary component of archaeological practice in the 2020s and beyond. While calls for decolonising the social sciences and humanities have become a common refrain, practical methodologies for supplanting settler-colonial research practice have been less apparent. We detail how the development of independent radiocarbon-based chronologies in archaeology is one such substantive path forward. As a joint group of Indigenous and Euro-American and Euro-Canadian researchers, we outline how collaborative research agendas that privilege the knowledge and interests of descendant communities and include independent chronology building can be developed and achieved, securing mutual benefit and distributing authority in the construction of archaeologically derived Indigenous histories.

[1] Department of Anthropology, University of Georgia, Athens, GA, USA. [2] Muscogee Nation Historic and Cultural Preservation Department, Okmulgee, OK, USA. [3] Huron-Wendat Nation Bureau de Nionwentsïo, Wendake, QC, Canada. ✉email: jabirch@uga.edu

Introduction

Archaeology is an inherently colonial discipline. The field has its roots in Western knowledge systems, social and racial hierarchies, colonisation, and the dispossession of Indigenous pasts from contemporary descendant and traditionally affiliated communities (Gosden, 2012; McNiven and Russell, 2005; Trigger, 1984). Calls for and efforts towards decolonising the production of archaeological knowledge have been reverberating in the discipline for some time (e.g., Atalay, 2006; Colwell-Chanthaphonh et al., 2010; Nicholas, 1998; Watkins, 2003). However, as Franklin et al. (2020: p. 754) write: "Changes in archaeology's paradigms, practices, and politics have always been entangled with events happening in the wider world." Various social movements (e.g., Black Lives Matter, Indigenous residential school histories) and the recent reckoning that disciplines, individuals, and countries have had with their own histories have profoundly shifted research agendas and modes of collaboration in archaeology. This changing worldview has galvanised support for the greater inclusion of marginalised voices and perspectives in in North American archaeology and beyond.

We, as a group of Wendat, Muscogee, American, and Canadian cultural heritage managers, preservationists, researchers, and academics believe that tangible steps towards decolonising archaeology involves displacing Western-dominated worldviews, institutions, and agendas in the field (Schneider and Hayes, 2020). However, decolonising is not merely a metaphor (Tuck and Yang, 2012). We argue that archaeology needs systematic efforts with clear outcomes to overturn settler-colonial dynamics in practice. Specifically, we argue that one of the critical steps in setting such a path is an explicit recognition of the deep historical connections that Indigenous peoples have with the archaeological record. We suggest that absolute dating and artefact-independent chronology building combined with Indigenous-led research agendas provides one route to forefronting decolonial perspectives in archaeological practice.

Colonial perspectives and categories are interwoven into the core methods and approaches of our discipline. Paramount is the way we categorise peoples, periods, and materials according to imposed taxa. Such taxa form the basis of culture-historical models that are inherently Eurocentric, having been imposed by predominantly white men of European ancestry in the twentieth century (i.e., Wright, 1966; Griffin, 1967). They privilege the onset of 'history' at the point of European contact (Liebmann, 2012; Panich and Schneider, 2019). These divisions contribute to a culture: history dichotomy whereby Europeans have histories and Indigenous peoples have cultures (Wolf, 1982).

As traditionally written, culture-histories are not histories, but packages of material traits bundled into geographic and chronological phases that reflect narrow dimensions of the lives and histories of past peoples. Worse, such cultural-chronological phases allow archaeologists to disassociate and associate groups as they will. For example, there are many cases where archaeologists argue that strong descendant ties cannot be made because of the uncertainty of the chronological record (Colwell, 2017). This carries implications for decisions about the repatriation of ancestors and belongings, the preservation of cultural heritage, and claims to ancestral territories. It also sets up a situation where descendant groups themselves are relegated to using categories defined by archaeologists from settler-colonial populations that may only be loosely reflective of their lived histories and connections to ancestral peoples, waters, and lands.

We argue that the development of independent radiocarbon-based chronologies is a practical, methodological approach for dismantling imposed colonial taxa and overreliance on European accounts of the early colonial period. Comprehensive absolute dating programmes are practical means of extending Indigenous history back into times before either living memory or written accounts. This is, of course, not to say or privilege radiocarbon dating as the end-all to knowing history. To do so would be yet another colonial endeavour. Indigenous people have their own chronologies and key inflection points embedded within their own historical knowledge. As such, while we see the development of radiocarbon chronologies independent of archaeologically-constructed culture history, we do not advocate approaching complex chronological schema apart from Indigenous constructs of such histories and advocate for collaboration in building and bridging shared knowledge.

Refined chronologies allow for the identification of the lived experiences and institutions that surround daily life. Such institutions govern people's day to day experiences and are key to linking the present with the past. Bypassing the conflation with material cultural patterns is key. For sites dating to ca. AD 1000–1700, two material types have played a central role in archaeological chronologies: ceramics and introduced European goods. Yet, there are problems with using such materials as the basis of Indigenous histories.

Ceramics are at best a starting point. As ethnographic research demonstrates, pottery style distributions and technology are only loosely linked to linguistic or ethnic groups (Gosselain, 2000; Lesage and Gaudreau, 2016). Thus, ceramic types are not necessarily linked to specific group identities that are of sufficient resolution, nor is it often clear what changes in ceramics mean over time. For example, in the Caribbean, archaeologists interpret shifts in ceramic series as meaning the wholesale replacement of waves of population immigration under culture-historical models. It is only recently that we have learned that these ideas are not supported by genetic evidence that identified connections across populations defined by ceramic series as well as to the modern people that live in the Caribbean today (Fernandes et al., 2021).

Chronologies based on the presence and absence of European goods in the early colonial era present other types of problems, including a false sense of accuracy and precision regarding site occupations. Further, a reliance on rare and often small objects (e.g., glass beads), sets up a decidedly biased framework. Generally, archaeologists constructed these chronologies early in the heyday of the development of culture-histories without a deeper consideration of sampling, recovery rates, nor the complex economic behaviours that governed the distribution and consumption of European goods. As recent research demonstrates, Indigenous peoples variously incorporated or rejected European goods (Birch et al., 2021; Holland-Lulewicz et al., 2020; Manning et al., 2018, 2019; Manning and Hart, 2019; Panich and Schneider, 2019). The singular importance of the assumed desire to engage in trade with Europeans also overlooks the fact that such objects often travelled along preexisting Indigenous long-distance trade networks and that the disruptions of the early colonial era variously served to cement or disrupt preexisting economic structures. Thus, developing site chronologies based on the presence of European goods does not consider the differential agency of Indigenous peoples.

By freeing ourselves from imposed culture-historical taxa and artefact-based chronologies through independent, radiocarbon-based assessments of the archaeological record, archaeologists and Indigenous peoples can collaboratively write more meaningful histories. The starting point for the studies we advocate for here include research agendas led by the interests of Indigenous peoples. In this model, archaeologists become partners and facilitators in advancing the needs of and questions posed by Tribal and First Nations collaborators. In doing so, we become co-producers of knowledge for the benefit of all. While working with Indigenous collaborators is the ideal practice, developing independent timeframes for human pasts is work that all

archaeologists can do as allies of Indigenous, Tribal, and First Nations groups. Key here is that, regardless how collaborative the project, there is a broad need to not collapse the human experience into temporal periods defined solely on the basis of stylistic changes in only one dimension of material culture (i.e., projectile points, pottery, trade goods, etc.).

Methodological and practical considerations

Radiocarbon dating is a technique based on western earth-science and measures the decay of carbon-14 in organic matter (Bayliss and Whittle, 2015). Use of Bayesian statistics in radiocarbon dating has led to increases in critical thinking about dates, dating, and chronologies (Bayliss, 2009). For example, decisions about how to combine radiocarbon dates in Bayesian models are based on archaeological information, but we are in control of which inferences we deem acceptable (Bayliss and Whittle, 2007; Bronk Ramsey, 2009; Bayliss, 2015). Combining dates from sites that share a ceramic tradition or distributions of European-manufactured goods involves a certain amount of circular reasoning as it assumes that sites that share certain practices or materials (or not) should be grouped together in time (or not). Conversely, dating archaeological phenomena independently can help to bypass 'conventional' archaeological wisdom and more closely approach when an event actually occurred in real, or at least radiocarbon-based, time. This can take different forms including utilising stratigraphy, running multiple dates on the same sample to 'wiggle-match' and overcome difficult areas of the calibration curve, to even the incorporation of historic dates of known events, among other approaches.

This new thinking about dates and dating has led archaeologists in many regions to maximise the benefits of extant collections and use legacy data in new ways (Wylie, 2017). Largely, the samples for constructing independent chronologies exist in repositories. Collaborative discussions should take place about sample selection and what should/should not be subject to destructive analyses. This includes acknowledging when to not date something due to community concerns; archaeologists must be willing to take no for an answer.

When we conduct fieldwork, archaeologists should think differently about how to collect data. Consideration should be given as to how to extract the maximal amount of information per unit of analysis, ensuring minimal impacts on the archaeological record (Verhagen, 2013; Warrick et al., 2021). Conversely, when we are working collaboratively, we can follow directives from Indigenous-led research agendas in designing survey and excavation strategies.

Absolute dating should also be part of the management and preservation of threatened sites. Many ancestral sites and places are threatened by development, climate change, sea level rise, and many other processes. An added benefit of a low-impact dating programme is that it can develop chronologies and ages for sites under threat and can help Indigenous communities and archaeologists prioritise site preservation, conservation, and research.

For research designs that explicitly target independent chronology building, the focus shifts away from collecting large assemblages of "diagnostic" material culture and to minimally invasive methods that target contexts from which appropriate material for dating can be collected. Organic materials (e.g., seeds, charcoal, animal remains) also provide information about lifeways, food, and interactions with the environment that are also of interest to Indigenous peoples. Care should be taken to avoid sites and areas that have the potential to disturb ancestors. Thus, the point is not just to simply locate archaeological sites, features, and materials in time, but to weave those material signatures of human activity together into macro regional narratives that constitute the history of peoples, places, and landscapes (Whittle, 2018).

Collaboratively constructing Indigenous histories through enhanced chronological precision

Historicising the past involves the linking of local and global histories (Robb and Pauketat, 2013; McNiven, 2016). In collaborative research agendas, this also means centreing and elevating Indigenous histories and what Tribal and First Nations know about their own history over Western knowledge. This includes parsing out event and process-based analysis of historical trajectories such as press and pulse environmental and social dynamics (Jentsch and White, 2019). Radiocarbon dating and Bayesian methods are tools that permit the working out of the tempo and scale of colonial impacts and Indigenous responses in a way that does not disassociate pre- and post-contact events (Lightfoot, 1995). This includes long-term cultural process as "press" forces (i.e., climate change) as well as short-term processes understood as "pulses" (i.e., disease) that require the reorganisation of the system in response. European contact has been viewed as a pulse when in fact it's a press with embedded pulses, shaped as Indigenous peoples responded variously to the pressures of these events. However, the extent to which European contact and colonisation were the dominant push or pull factors in what Indigenous people did in the early colonial area (i.e., stay in a region, acquire certain goods) has been dominated by explanations that centre the narrative accounts of European actors. We need the other side of the story. In absence of written or oral histories of those early years of colonisation, tight chronological control of archaeological sites is critical as this record that can speak to persistence, movement, varying traditions or transformations and the like.

The research agendas being directed by the Huron-Wendat and Muscogee Nations are driven by their own knowledge of their history. Population movement is a persistent theme. Another is demonstrating Indigenous persistence and survivance beyond colonial observers. These approaches can combat what Panich and Schneider (2019) have called "Indigenous erasure" after the arrival of Europeans and foreground narratives that emphasise resilience and continuity (Kretzler, 2019; Schneider, 2021).

Huron-Wendat Nation. The contemporary Huron-Wendat Nation is located in Wendake, Quebec, Canada; just north of Quebec City. Their ancestors occupied landscapes in what is now south-central Ontario and southern Quebec and they retain an interest in the places and histories embedded in those landscapes. Northern Iroquoian sites have traditionally been dated using ceramic seriation and the presence or absence of chronologically diagnostic trade goods. Recent efforts to independently date sites in multiple sub-regions of Northern Iroquoia have shown relative dating assessments to be as much as 75–100 years too early (Manning et al., 2018; Birch et al., 2021) or too late (Manning and Hart, 2019). The shifting position of certain sites and phenomena have challenged archaeological constructions of Huron-Wendat history, with results that are in keeping with Wendat scholars' notions of 'circular' societies and the incorporative nature of ancestral Huron-Wendat communities and nations (Sioui, 1999; Birch and Lesage, 2020).

The Huron-Wendat Nation's Bureau de Nionwentsïo is concerned with the stewardship and management of cultural and natural resources in the current and ancestral territories occupied by the Nation. A new research agenda originating in the Nionwentsïo Office focuses on tracing population movement and landscape use in the St. Lawrence River Valley both before and after European contact and colonialism. It has been speculated that between Cartier's journey down the St. Lawrence River in 1534 and Champlain's travelling the same route in 1603,

populations practicing an Iroquoian way of life "disappeared" from the St. Lawrence River Valley (Trigger, 1979; Pendergast, 1991). In reality, this disappearance can be better characterised as population movement and incorporation into adjacent communities and societies as was common throughout ancestral Huron-Wendat history (Birch, 2015; Birch and Lesage, 2020; Lesage and Williamson, 2020).

It has been proposed that settlement relocation in the St. Lawrence River Valley proceeded from west to east (Chapdelaine, 2016). It is also likely that relocation involved movements into landscapes and drainages north and south of the valley (Petersen et al., 2004; Fox and Pilon, 2016), as well as the possibility that certain kinds of persistent landscape use (i.e., hunting and gathering of resources) escaped the gaze of early French colonists. With these postulates laid out, our work involves three interrelated foci.

The first is extensive dating of village and semi-permanent sites in the St. Lawrence Valley. Specifically, what was the precise timing of site occupations, abandonments, and use? Having more precise dating of human activity in the valley will allow us to better understand population movements. Do sites containing Iroquoian material culture persist in the region beyond the early 1600s (following Champlain's journey) and how might groups have continued to use this landscape in ways that were not observed by Europeans? The second objective involves dating sites in the Saguenay River drainage, which flows south to meet the St. Lawrence River at Tadoussac. Many of these are seasonally occupied or semi-permanent camps; whereas outsider archaeologists tend to focus a disproportionate amount of attention on villages, these are the sites that the community wants to better understand. How do the dates of occupations for sites in the Saguenay River drainage relate to dates for the occupation and abandonment of permanent settlements in the St. Lawrence River Valley? The third objective is to evaluate the persistence of landscape use, and particularly deer and moose hunting in the Lac St Charles region north of historic and modern-day Wendake. How long were people hunting in this region? How does hunting activity in the St. Charles River and Lac St. Charles regions relate to the Huron-Wendat settlement at Wendake and L'Ancienne Lorette? How were people utilising the landscape around Wendake seasonally, i.e., for winter hunting? The results of this work promise to develop a better understanding of the movements of Wendat populations between the St. Lawrence Valley and the Great Lakes and generate a more accurate narrative for what happened to the St. Lawrence Iroquoians after Cartier and Champlain's travels.

This project represents an important collaboration. It creates a space where the voice of every member of the team is considered, as in the Wendat's Great Circle. By working together, we can discover new data and new knowledge or confirm what was transmitted by Wendat ancestors. The project also promises to open new areas of research. By revisiting the dating of these sites, we can inform, confirm, or create new hypothesis based on the resulting data. There is also the aspect of confronting information presented decades ago that is still used as the basis of research, be it archaeological, historical or anthropological. In some cases, this information seems unalterable and "never should be doubted," when in fact what is assumed to be baseline knowledge needs to be tested using the most up-to-date techniques available and narratives correspondingly rewritten as needed. What will come out of this project could very well change how Indigenous histories and cultures are seen in the province of Quebec.

Muscogee Nation. The Muscogee (Creek) Nation is a federally recognised Tribal Nation located on their reservation in the U.S. state of Oklahoma. Their ancestors occupied landscapes in what are now the states of Georgia, Alabama, and portions of the Carolinas, Mississippi, Tennessee, and Florida. They are also concerned with the routes by which Muscogee peoples were forcibly removed from their ancestral lands and other places of Muscogee resettlement. The questions and issues that representatives of the Muscogee Nation are interested in are foregrounded in the present. A primary concern includes addressing the severance between archaeology and the culture or people it claims to be investigating.

Muscogee ancestors constructed monumental earthen mounded architecture in a tradition that stretches back for millennia. However, it's uncommon for a modern-day tribe to be associated with mound building, which results in the disassociation of archaeological cultures and contemporary propels in matters of cultural affiliation. We do not see references to Muskogean Moundbuilders (or mounds affiliated with other contemporary groups for that matter) despite the "preponderance of the evidence for cultural affiliation" (Chandler, 2021). The reference is almost always to "Mississippian Moundbuilders." The above, of course, underscores the fundamental disconnect between culture history and tribal history. By reconnecting mound-and-plaza complexes and councils to Tribal Towns and ceremonial grounds, we can rearticulate Muscogee history with the archaeological record.

Another key issue for the Muscogee Nation is linking archaeological sites to Tribal Towns, which in turn are tied to genealogical histories. As co-author Turner Hunt notes: "I am fortunate enough to know the names in my maternal line for six generations because it was recorded on my great grandmother's census card in 1895—while the names shift from Mvskoke to English through time, our clan and our Tribal Town remained the same." To say that the Tribal Town is supplanting individuals as part of direct ancestry would be to rely back on the western model in lieu of understanding that the Tribal Town has always been what Muscogee people consider their genealogy—meaning, instead of focusing on the individual, focus is on the collective ancestry evidenced by matrilineal clans and matrilocal Tribal Towns. Archaeology and enhanced chronologies can assist in understanding those communities by revealing patterns of migration, trade, as well as change over time.

Archaeology can play an enhanced role in linking ancestral Tribal Towns and population movements to present-day peoples and identities. Only recently have Muscogee people, often referred to as Historic Creeks, had a history that predates contact. For all of the last half century the town of *Kvsehtv* has been separated from its clear archaeological counterpart because it has been known as the "Abercrombie phase." Developing direct connections between the contemporary Muscogee Nation and its constituent parts with specific archaeological sites and Tribal Town locations also has implications for repatriation under the Native American Graves Protection and Repatriation Act (NAGPRA). Having an accurate chronology (i.e., culture history) is something that Tribes rely on more than most archaeologists might realise, as they can sometimes fit with migration stories and oral histories (Thompson et al., 2022). Thus, the importance of developing independent chronologies and tribal histories comes into sharp focus when we consider how necessary they are to tribes. The question then is, how do we do this better and be unlike colonisers of the past? While archaeological culture-histories have their use as tools, ultimately, they function to sever ties between present and past peoples such that Muscogee histories and identities are lost to archaeological cultures. Archaeologists must understand that tribes want to define their own histories. Understanding and having accurate chronologies is paramount to these endeavours. What we need is a better tribal history that links ancestors, Tribal Towns, and population movements to present-day peoples and identities in "real time."

AMS dating of potential "contact-era" and early colonial sites that do not yield European trade goods can defy traditional artefact-based relative dating. People did not always leave materials behind when using or constructing a place or acquire European-manufactured goods when they appeared elsewhere in the landscape (Manning et al., 2018; Holland-Lulewicz et al., 2020). In fact, there may be cultural aversion or resistance to incorporating European goods that is often overlooked in estimating the ages of sites. While radiocarbon dating sites in the 1480–1630 period has at times been hampered by multiple intercepts in the calibration curve, creative use of sample selection and Bayesian modelling now allows us to overcome those problems (Manning et al., 2020; Manning and Birch, 2022). There are no more excuses for relying on artefacts as passive chronological—as opposed to active cultural—markers. Mapping the spatial and temporal distribution of Muscogee-associated technologies is part of linking related, interacting, and sequential Muscogee communities.

Another important aspect of reassociation between contemporary peoples and archaeological sites involves reconstructing population movement in the distant and more recent past. While movement in the Southeastern North American landscape has long been an aspect of Muscogee tradition (Cobb and King, 2005; Pluckhahn et al., 2020), the sixteenth–eighteenth centuries was a time of particularly extensive movement and coalescence into new, modified, and resilient social and political formations. While the "shatter zone" concept (Ethridge, 2019) may not have been intentionally conceived as a means of disassociating modern and ancestral cultures, when employed uncritically as a metaphor for cultural destruction as opposed to resilience it can. For example, in Georgia in the 1600s the Oconee, Yamasee, Guale, and other populations moved to different areas to access trade, gain protection, resist subservience, and otherwise act strategically of their own agency and volition. We need to understand the chronology of these movements, and, of course, the potential reasons for them as well. To do this we need to think beyond pottery chronologies as they do not provide the adequate resolution for such questions.

More broadly, collaboration between archaeologists and tribal historians assists one of the primary goals of educating Muscogee citizens and the public about their history. We argue that a focused dating programme aimed at better understanding population movement and transformations in the settlement landscape is an approach that can productively move that conversation forward in mutually beneficial ways.

Future directions

Meaningful collaboration between archaeologists and descendant and traditionally associated communities is unarguably the future of archaeological practice. This new paradigm involves not only a commitment to working together in the co-production of knowledge but also the integration of practical methodologies for decolonising archaeology. We argue that independent, radiocarbon-based dating programmes coupled with Bayesian chronological modelling is one such approach.

Achieving collective aims in this way involves a progressive approach to research design.

This includes building rapport. Sometimes what archaeology can provide and what Tribes need is not clearly evident. Productive conversations should not begin with academics saying "hey, what can I tell you about your past." Getting to know each other is the first step in building trust whereby collaborative research agendas start to show themselves.

This includes archaeologists acknowledging the fact that archaeological cultures or culture-histories are not real culture. An archaeologist may have mastered the literature of their field but cannot say the word for "house" in the language of the people whose houses they are investigating — they have never tasted the food—never heard the language. When we pull the mask away, so-called *experts* aren't really all that expert. At the same time, the methods and approaches we employ are complex concepts, distiling the resulting information—including both new knowledge and uncertainty—into formats that facilitate broader sharing and discussion with Indigenous communities (and, as appropriate, the general public) is also key.

This work is not only important to research from an academic standpoint but involves foregrounding Indigenous knowledge production in the stewardship of cultural heritage and re-imagining collaborative publishing and dissemination of knowledge in a way that serves to incorporate multiple voices, as we have done here. In this way, the role of radiocarbon dating in advancing Indigenous-led archaeological research agendas is not just about building better chronologies, but advancing principles of distributed authority in terms of what we can do with them.

Data availability

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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Additional information
Correspondence and requests for materials should be addressed to Jennifer Birch.

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