Journal of Archaeological Science: Reports 8 (2016) 102–111

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Interpreting Iroquoian site structure through geophysical prospection and soil chemistry: Insights from a coalescent community in Ontario, Canada

Jennifer Birch

Department of Anthropology, University of Georgia, 250A Baldwin Hall, Athens, GA 30602-1619, United States

ARTICLE INFO

Article history:
Received 20 February 2016
Received in revised form 26 May 2016
Accepted 28 May 2016
Available online 5 June 2016

Keywords:
Northern Iroquoian societies
Community organization
Magnetic gradiometry
Magnetic susceptibility
Soil phosphate analysis

ABSTRACT

In the fifteenth and sixteenth centuries A.D., northern Iroquoian communities in southern Ontario and upper New York State came together into large, palisaded village aggregates. Over time, these coalescent communities exhibit increasing degrees of socio-political complexity and reorganization of the built environment. This paper employs magnetic gradiometry, magnetic susceptibility, and soil phosphate analysis to help infer the settlement structure of Spang, a coalescent community located east of Toronto, Ontario, Canada. The results are interpreted with reference to the fully-excavated Draper and Mantle sites, occupied before and after Spang in this contiguous community relocation sequence. The results suggest the potential presence of longhouses, a palisade, and a central plaza consistent with increased community integration over time. As geophysical prospection is infrequently employed on Iroquoian village sites, the results suggest the potential of these techniques as components of research designs employed by researchers and cultural resource managers.

1. Introduction

Studies of settlement patterns continue to be essential to the objectives of contemporary anthropological archaeology (Feinman, 2015; Kowalewski, 2008). We must understand how peoples organized themselves in space and over time at multiple social and spatial scales in order to answer the most important questions about past cultural processes (Kintigh et al., 2014).

The archaeological record of Northern Iroquoian peoples is especially well-suited to the study of settlement landscapes and intra- and inter-community patterns. Whereas many archaeological sites are amalgams of hundreds or thousands of years of occupation, prehistoric Iroquoian village sites were only occupied for an average of 10–40 years (Birch and Williamson, 2013a:99–101; Warrick, 1988), before being relocated. Village relocations were prompted by both ecological (e.g., depletion of local resources) and socio-political factors, with population size being a significant predictor of the frequency of village relocation (Jones and Wood, 2012). When villages did move, it was generally a few kilometers away, usually within the same drainage (Williamson et al., 1998; Birch and Williamson, 2015), although longer migrations also took place (Engelbrecht, 1995; Ramsden, 1990; Sutton, 1996). The resulting archaeological settlement patterns permit the construction of fine-grained chronologies and detailed insights into processes of cultural change at both the local and regional levels. In Ontario and New York State, multiple village relocation sequences have been reconstructed which represent hundreds of years of contiguous occupation by the same community. This project fills an important gap in one such sequence, located on West Duffins Creek east of Toronto, Ontario (Fig. 1). Here, one well-studied ancestral Wendat community relocation sequence, including the Draper, Spang, and Mantle sites, has provided significant insights into how a process of coalescence transformed a collection of villages into a formative nation who would go on to join the Wendat (Huron) confederacy by the time of direct European contact (Birch, 2012; Birch and Williamson, 2013a, 2013b; Williamson, 2014).

2. Coalescence in Iroquoian Ontario

2.1. Coalescent societies and communities

Coalescence describes a cultural process that has been observed at the community and regional levels among small-scale and medium-complex societies (Birch, 2013; Kowalewski, 2006, 2007). It involves settlement aggregation that is often stimulated by widespread societal disruptions including encroachment, climate change, or conflict (Kowalewski, 2006:117). While coalescence is ultimately a macro-regional phenomenon, it's most salient effects would have been felt by individuals and sub-community groups, as they negotiated or renegotiated relationships during periods of societal transformation. For this reason, it is important that we study the relationship between macro-scale cultural processes and the lived experience of communities.

E-mail address: jabirch@uga.edu.

http://dx.doi.org/10.1016/j.jasrep.2016.05.067
2352-409X/

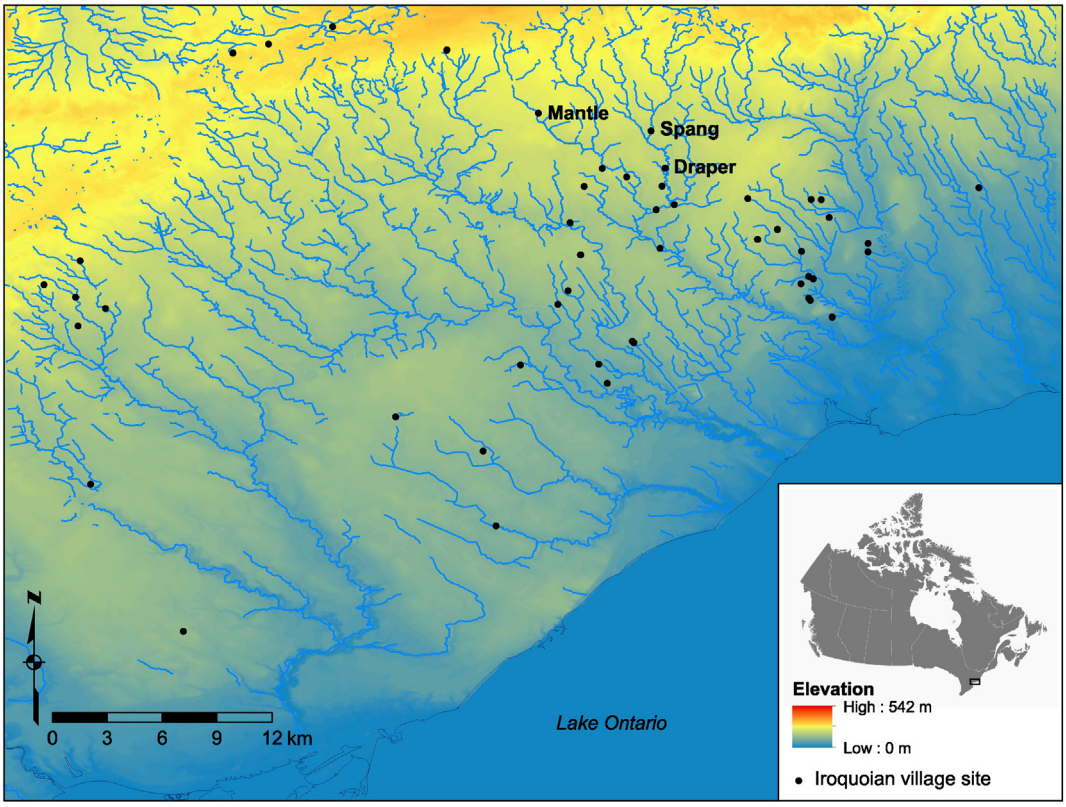

Fig. 1. Location of Iroquoian village sites on the northwest shore of Lake Ontario, sites discussed in text indicated.

Commonly-occurring responses to coalescence include the formation of large, multi-ethnic, communities, changes in the social means of production, new integrative mechanisms, and political reorganization favoring include corporate or collective leadership (Kowalewski, 2006, 2007). Important to the present study is that coalescence encourages changes in the built environment that promote community integration. Coalescent communities often involve the addition of plazas, courtyards, dance grounds, and other public spaces which help to facilitate integrative cultural practices which brought together large cross-sections of local populations (Adler and Wilshusen, 1990; Birch, 2012, 2013; Lipe and Hegmon, 1989).

2.2. Fifteenth century coalescence and conflict

Between ca. A.D. 1300 and 1420, Iroquoian village sites generally consisted of one or more clusters of longhouses and averaged 1–2 ha or less in area (Birch and Williamson, 2013a; Warrick, 2008). During this same interval, the population of south-central Ontario increased from some 10,000 to 24,000 persons (Warrick, 2008). Warrick (2008) attributes this pattern of population growth to increased reliance on maize, and the increased in fertility coupled with decreased infant mortality associated with the Neolithic demographic transition (Bocquet-Appel, 2011; Bocquet-Appel and Naji, 2006). This population growth may have contributed, in part, to the rapid and profound changes that occurred throughout Iroquoia after ca. A.D. 1450.

During the mid-to-late fifteenth century, a rapid increase in violent conflict is evident in the archaeological record. Multi-row palisades, earthworks, and defensive site locations become the norm in both southern Ontario and Upper New York State (Birch, 2015), and human remains bearing signs of violent trauma and modification are present on many sites (Jenkins, 2015; Williamson, 2007). This increase in violent conflict contributed to the coalescence of small village-communities into densely populated, heavily defended settlements ranging from 2 to 4 ha in size (Birch, 2012, 2015) and with populations of up to 1800 individuals (Birch and Williamson, 2013a:77–79; Finlayson, 1985). The remainder of this paper focuses on the investigations of a single site relocation sequence located in the West Duffins Creek drainage, east of the city of Toronto (Fig. 1).

2.3. The West Duffins Creek site sequence

The West Duffins Creek site sequence is arguably the most intensively studied community in Iroquoia (e.g., ASI, 2014; Birch, 2010; 2012, in press; Birch et al., in press; Birch and Williamson, 2013a, 2013b; Carter, 1981; Finlayson, 1985; Pihl, 1984; Poulton, 1979). Chief among these sites are Draper and Mantle, which are among the largest completely excavated Iroquoian villages in eastern North America (ASI, 2014; Birch and Williamson, 2013a; Finlayson, 1985). Their settlement patterns, material culture, economic organization, and socio-political complexity have been extensively analyzed and documented (Birch, 2012; Birch and Williamson, 2013a, 2013b; Finlayson, 1985). However, our lack of knowledge about Spang, the village occupied intermediately between Draper and Mantle, represents a significant gap in understanding of how this community was transformed during a process of coalescence.

In the mid-fifteenth century, A.D., eight small village-communities came together to form the 4.2 ha Draper site (Fig. 2a). Evidence for sequential palisade expansions to accommodate new clusters of longhouses, each of which is thought to represent a previously distinct population, suggests that aggregation occurred gradually, over the estimated 25–50 year lifespan of the settlement (Finlayson, 1985; Warrick, 2008:136–137). Although they shared a palisaded enclosure, the fact that each longhouse cluster remained spatially distinct within the growing settlement suggests that these groups were incompletely integrated and that negotiations and realignments in socio-political organization were ongoing (Birch, 2012).

It is believed that Draper's population relocated *en masse* to the Spang site in the late fifteenth century and subsequently to the Mantle