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Chapter 13

Northeastern Paleoethnobotany: How Are We Doing?

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The potential for northeastern macrobotanical studies clearly is being realized with this collection of papers. No longer can we say, "all is potential" (Dincauze 1981). Some of the potential had been envisioned and realized as early as the 1960s, but until flotation caught on the following decade, many questions had yet to be formulated, let alone answered (Crawford and King 1978; Finlayson and Byrne 1975; King and Crawford 1979; Yarnell 1964). The contributors to this volume have articulated a series of questions and are engaged in important research and debate adding to the quickly developing field of northeastern palaeoethnobotany. Here, I explore the contributions to this volume from the vantage of having been involved with some of the first flotation in the Great Lakes region and from having access to a database from the Canadian side of the border (see Figure 13.1). As such, I more broadly define the Northeast than do the other papers and include eastern Canada as well as Michigan and northern Ohio.

The chapters sort into three general groups as I see them: (1) syntheses or flotation studies (Chapters 2, 5, 7, 8, 10, 12); (2) examinations of particular taxa (Chapters 3, 5, and 9); and (3) two miscellaneous contributions (Chapters 4 and 11). Among the themes common to many of the papers is the timing of maize's introduction to the Northeast and its role in local subsistence regimes. Wild plants are certainly not ignored but are somewhat secondary to the issue of cultigen presence, particularly in the later periods. Seasonality and settlement pattern figure prominently, and some consideration is given to the potential for the presence of cultigens other than maize. But cultigens and their context and meaning are high priorities to many of the contributors.

With the exception of Bodner, King, Asch Sidell, Largy and Almquist-Jacobson, the contributors are not specialist archaeobotanists. As Hart (Chapter 1) points out, several other collected works on palaeoethnobotany in eastern North America have appeared in the last ten years, but the contributors to these volumes are, for the most part, specialists. Why the opposite should be the case here may partially be understood because few specialist archaeobotanists have been trained in the Northeast. Yet there are compelling reasons, such as those listed above, to carry out research on the relationship between plants and people in the Northeast. Those who need the information are creating the discipline in the Northeast.

Among the nine papers dealing with diverse collections of plant remains from specific sites, probably the most dramatic among these because of its time depth is Asch Sidell's (Chapter 12) that presents nearly 10,000 years of Maine prehistory. As further evidenced by Almquist-Jacobson and Sanger (Chapter 11), Maine is proving to have a rich body of information on the relationship between plants and people in prehistory. Asch Sidell has continued to pursue her botanical interests developed and first applied in the Illinois valley. Her depth of experience is welcome news to Maine archaeology. In the Great Lakes region, plant remains data from the Paleoindian period (11,000-10,000 B.P.) have not been collected systematically by flotation so the Early Holocene data from Maine is almost without precedent. The nearest Early Holocene archaeobotanical collection is from Meadowcroft Rockshelter in Pennsylvania (Cushman 1982; King, this volume).

The Archaic (10,000-3,000 B.P.) is better represented in the Northeast. Archaic flotation samples in the Great Lakes region include those from Weber I and Eidson in Michigan (Egan 1988; Parker 1984), and McIntyre (McAndrews 1984; Yarnell 1984), Bell, Innes and Peace Bridge in Ontario (Ellis et al. 1990; Monckton 1997). Based on these collections, we had begun to see a range of variation in the archaeobotanical record of the Early and Middle Holocene inhabitants of the Northeast. The nuts evident at Meadowcroft are

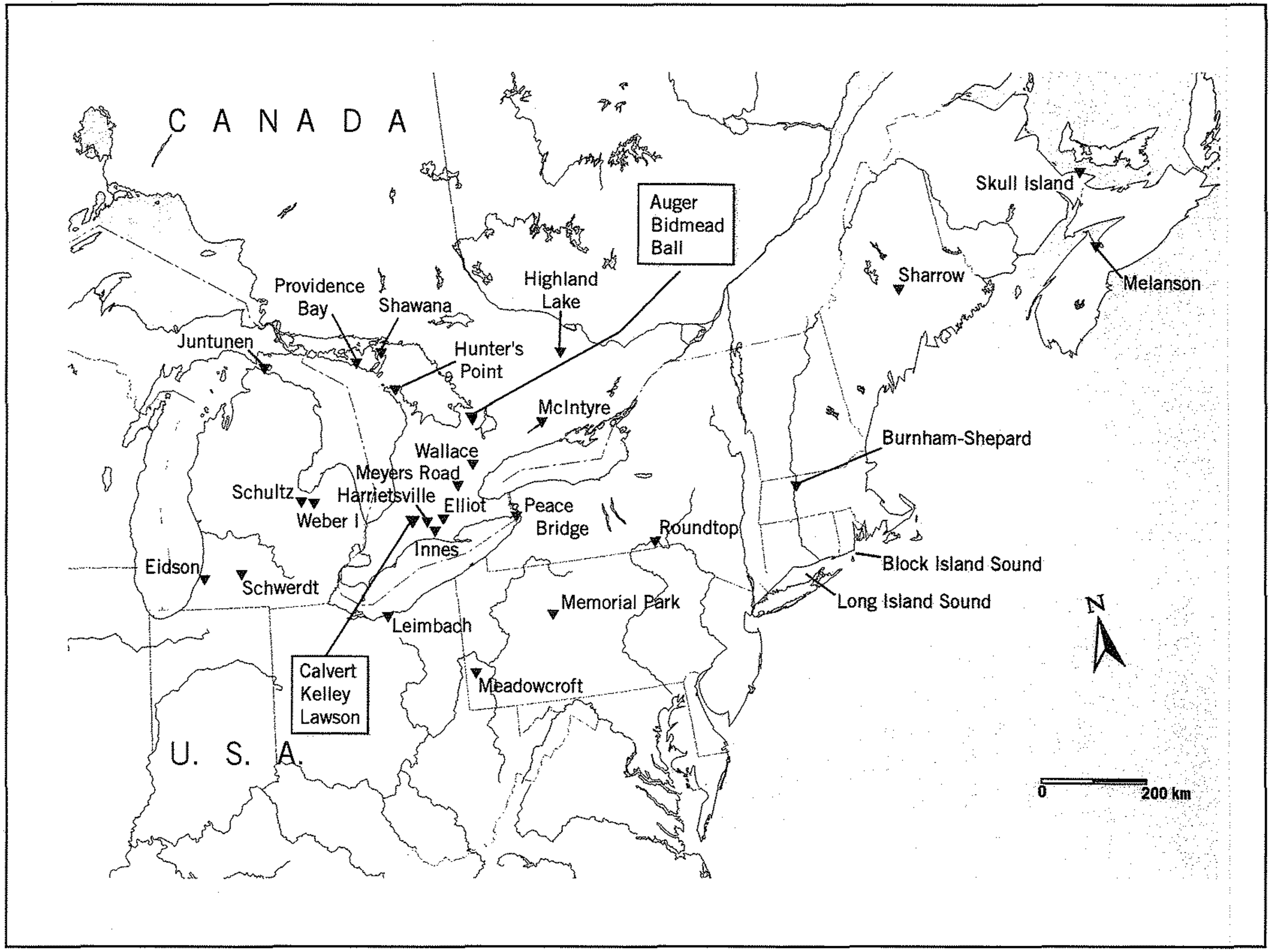

Figure 13.1. Location of sites mentioned in text.

not part of the Maine Paleoindian record, although the samples are small, and we ought not to attach much significance to negative evidence from small samples. The explanation for the lack of nuts in the Maine Paleoindian record is that nut trees had not yet migrated into the area (Chapter 11). Despite its northeastern location, the environment around Meadowcroft during Paleoindian times, unlike Maine, was similar to today's environment (Adovasio et al. 1982:264). Nevertheless, seeds of other plants are part of the record of the Early through Middle Holocene record at Meadowcroft, and the pattern is the same in Maine. Nuts are part of the Maine Archaic record as are fleshy fruits. Plants such as buttercup (Chapter 5), chenopod, lily family, a wild bean, and cleavers hint at a broader range of plants having been collected. This range may have included wetland plants, if Almquist-Jacobson and Sanger (Chapter 11) are correct in their interpretation that uplands provided a changing and less dependable resource base, while the more stable wetlands fostered a greater dependence on associated resources.

Beyond the presence of fleshy fruits and nuts in Archaic period samples, no consistent pattern is apparent. One oddity in the apparently idiosyncratic archaeobotanical record of many sites is a domination by a single and varying taxon of small-seeded plant. At the Weber I site, for example, a mustard (Brassicaceae) seed is most common (Egan 1988). In Middle Archaic Maine, the most common small seed is *Galium* (cleavers) (Asch Sidell). At McIntyre in Ontario (ca. 3,700 B.P.) a chenopod, *Chenopodium gigantospermum*, is the most common small seed (Yarnell 1984). We still have a long way to go and many more samples to collect before we can assess what was probably a complex relationship between plants and people in the Northeast during the Paleoindian and Archaic.

The cucurbit rind from the Sharrow site (6,700-6,300 cal B.C.) is an extraordinary find indicative of the kinds of discoveries that must still await us in the Northeast. Coupled with the Memorial Park site cucurbit remains dating to roughly the same time (Hart and Asch Sidell 1997), no doubt the plant was present in the Northeast then. Until recently, the earliest cucurbit evidence in the region was an impression of a seed in an Early Woodland (2,400 B.P.) sherd from the Schultz site, Michigan, two seeds from the nearby Green Point site (Ozker 1982:40), rind from four features at the Leimbach site (Ozker 1982:198), and Cucurbita "remains" from Strata III and IV at Meadowcroft (ca. 3,000 B.P.) (Cushman 1982). Similar cucurbit is evidenced further west from a Late Archaic context in Minnesota (2,530±60 B.P.) (Perkl 1998), indicating that the plant was probably widely known in the Northeast well before other southern plants diffused north. Asch Sidell seems assured that the cucurbit was growing in Maine during the Middle Holocene, but I am less confident. It would be prudent to keep open the possibility that cucurbit was traded into New England and did not grow there. Although Asch Sidell points out that there is no long-distance trade evident in the New England archaeological record at this time, she may have just found it. Often plant remains provide a more fine-grained resolution for exploring such issues than other archaeological remains do.

To the south, Long Island and Block Island Sound also have significant depth to their archaeological assemblages (Bernstein, Chapter 7). Here, too, nuts are common in the Archaic record, as are fleshy fruit seeds. Diversification of plant use was ultimately an important adaptation, although Bernstein sees no major changes in plant use for millennia. The Long Island sites with no carbonized plant remains except wood charcoal are unusual. I wonder if they may be winter occupations? Apparently, the sites have an abundance of mollusk shell, so some direct evidence of seasonal harvesting of shellfish, at least, could be obtained. The only potential native cultigen they report is *Chenopodium*, but it is probably wild (Chapter 8). Corn is reported from a few sites but is rare.

The McIntyre site in Ontario has the most comprehensive Late Archaic archaeobotanical data set in the province (Yarnell 1984). A large quantity of seeds resulted from the excavation (7,500 from 5,400 liters of soil). To Yarnell, the assemblage contains clear evidence of anthropogenesis, a theme not taken up by any of the papers in this volume. The hemlock (*Tsuga canadensis*) crash (Almquist-Jacobson and Sanger, Chapter 11) in the Northeast during the Archaic might have compounded with anthropogenesis to provide even more productive open habitats (McAndrews 1984). In reality, however, we simply do not know what the local ecological impact of the short-term demise of hemlock was.

George and Dewar (Chapter 8) focus on *Chenopodium* whose record extends from the Late Archaic through Late Woodland. Although they can find no clear evidence of domesticated *Chenopodium* in Connecticut, they raise some interesting points. First, *Chenopodium* use extends beyond the Midcontinent, and second, processes that may have ultimately led to domestication of *Chenopodium* and other plants in the Midcontinent were impacting the Northeast. In the southeasternmost corner of the Northeast as defined in this volume (Pennsylvania), thin-testa *Chenopodium berlandieri* ssp. *jonesianum* and a potential pale-seeded type resembling the Mexican cultigen huazontle are reported from early Clemson's Island features at the Memorial Park site in Pennsylvania (Hart and Asch Sidell 1996:17). The most common seed at Memorial Park is little barley (*Hordeum pusillum*) that was likely grown at the site (Hart and Asch Sidell 1996:17). It may not be far-fetched to consider that chenopods were being grown in early Connecticut as well.

Chenopodium use in the Northeast extends beyond Pennsylvania and Connecticut. In Ontario, *Chenopodium* is documented in the Late Archaic (the McIntyre site). Chenopod is also common in Late Woodland sites (ca. 1,400-400 B.P.). Unlike in Connecticut, the species from the Late Archaic McIntyre site (*C. gigantospermum*) is not the same as the one from Late Woodland sites. Just as in New England, the later prehistoric Ontario chenopod is an intermediate, weedy form that appears to be quite similar to, if not, *Chenopodium berlandieri* that was domesticated further to the west. It seems that two other plants, little barley and a small- seeded form of *Iva annua*, had also made their way to Ontario by the Late Woodland. One specimen of *Iva* is reported from the Harrietsville site, and little barley is reported from at least three other sites in addition to Harrietsville (Monckton, personal communication; Ounjian 1998). People may well have been spreading weedy/cultigen chenopods in addition to these other plants. This is speculative, but might be worth a look. At the least, chenopod will need continued serious attention in this region, and we should be scouring our samples for signs of other native cultigens.

The timing of the appearance of tropical cultigens, maize in particular, and their meaning in terms of the extent to which people were agricultural is a theme common to several papers. The lack of agreement between Chilton (Chapter 10) and the others intrigues me. All have access to roughly the same data, yet the major point of disagreement seems to be the extent to which interior groups relied upon maize. Chilton raises some pertinent questions. Unfortunately, the answer to the debate is not at hand. A methodological point of contention is how to interpret quantities of maize from various sites. This is exacerbated by the general lack of quantitative rigor in these papers. Without digressing to the large literature on the issue of cultigen representation and quantification at sites, I think that too often plant husbandry is presumed on the basis of small quantities of cultigens from sites all over the world, not just the Northeast. But dismissing the Burnham-Shepard case with its 1,500 fragments of maize from 16 features does not make sense either. Density or other ratios would help assess the quantitative significance, of course. In Ontario Iroquoian sites from 750 B.P. and later, there is a marked range of variation in maize densities within which the Burnham-Shepard numbers seem to fit. At three extensively sampled sites in Huronia (Auger, Ball, and Bidmead), kernel densities, on average, range from 2 per liter at Ball to 13 per liter at Bidmead (Monckton 1992). The Wallace site kernel density is higher at roughly 30 per liter (Crawford 1986). Kernel densities at Glen Meyer (ca. 850-650 B.P.) and prehistoric Neutral (ca. 500 B.P.) sites are generally less than 1 per liter except for Calvert, Kelly, Elliot, and Lawson, whose average kernel densities range from 1.3 to 33 per liter (Ounjian 1998). The Middle Iroquoian Myers Road site kernel density is also less than 1 per liter (Monckton 1998). Few would question that maize was grown at these sites, yet the densities of kernels ranges from low at some sites to quite high at others. Other information such as technology, settlement pattern, and indicators of anthropogenesis (e.g., weeds) must complement the quantity of maize reported from sites to help us understand what maize's presence means.

Other northeastern sites have cultigen remains that are in all likelihood in hunting and gathering contexts. They include Juntunen (Yarnell 1964), Providence Bay (Conway 1986), Shawana (Conway 1989; Crawford 1989), Hunter's Point (Goode 1991), and Highland Lake (von Gernet 1992). Coupled with ethnohistoric evidence of interaction between Algonquins and Iroquoians, I am not surprised to see some convergence in their archaeobotanical assemblages. No one seriously contends that crops were grown at these northern tier sites. The situation along the diffuse northern boundary between Iroquoians and Algonquins is reminiscent of the one in New England described by Chilton. Highland Lake, Ontario, for example, is interesting for a number of reasons including its small size, its rugged setting, its artifact assemblage, and the range of cultigens recovered (maize, sunflower, tobacco). Highland Lake is in Algonquin territory, but the artifact assemblage is very much Iroquoian if the pottery is traditionally interpreted (von Gernet 1992). Von Gernet eschews interpretations that make simplistic links between pottery styles and linguistic groupings. He feels that Highland Lake is an Algonquin site because of its locale (von Gernet 1992:109). However, Iroquoian groups traveled outside their territories, so if Highland Lake represents such a group, we have an example of people transporting crops outside their normal growing range. If the occupants were Algonquin, then here is a case where hunter-gatherers were consuming cultigens. In contrast, on the lower Kalamazoo River in southwestern Michigan is the Schwerdt site, an Upper Mississippian fishing camp, with a completely wild plant assemblage recovered from 46 features (Cremin 1980). Considering the dependence of Upper Mississippian peoples on food production, they might well have brought maize and other crops to Schwerdt, but the evidence is to the contrary. So the presence or absence of crop remains on sites is not so simple to explain.

Setting aside the debate about the relative importance of agriculture at various sites in the Northeast, we need to better understand the middle ground between hunter-gatherers and agricultural people. In the Northeast, people were living in some areas with a mixed economy variably dependent on crops and wild resources. Continued work on the nature of this variation will be of comparative importance to modeling behavior elsewhere in the world when similar situations seem to have existed (Archaic and Formative Mexico, the North American Midcontinent, and Jomon Japan, to name a few).

At any rate, Cassedy and Webb (Chapter 4), Bendremer (Chapter 9), George and Dewar (Chapter 8), Largy et al. (Chapter 5), Asch Sidell (Chapter 12), and Chilton (Chapter 10) provide important data that, for the most part, are not available elsewhere. I would like to see more methodological clarity in the papers, though. Only one paper uses densities, while another (Largy, Chapter 5) includes a self-conscious discussion of methodology. The lack of consistent, standard reporting methods by the authors has drawbacks too. Although useful to explore various data-presentation formats, each author seems to devise their own system. I prefer to use a cascading tabular system that moves from general to specific categories with plant names across the top and samples/context down the left (see Monckton 1992). Finally, archaeobotanical reports should normally list sample volumes. Many of the reports in this volume do not.

The Late Woodland is better documented than nearly any other time throughout the Northeast. This appears to be the case in many of the papers in this volume as well. In Ontario, numerous sites have had systematic flotation conducted on them. Today, nearly all CRM work includes extensive flotation. My students and I have worked on over thirty comprehensive Late Woodland collections. Two excellent studies, one on a set of four contemporaneous populations in Huronia and another on a series of five Glen Meyer and eight prehistoric Neutral sites in southwestern Ontario, span the period from 750 B.P. to 300 B.P. (Monckton 1992; Ounjian 1998). Monckton has explored the relationship between the ethnohistoric record in Huronia (see, for example, (Heidenreich 1972) and the archaeobotanical record while researching dietary and ecological questions. Ounjian (1998) similarly has provided a detailed palaeoethnobotanical assessment of the thirteen sites in her study. Both have incorporated context as an important analytical variable; that is, their intersite comparisons try to control for context specific variation. Both studies provide exceptionally good insights into Late Woodland subsistence ecology in Ontario. Particularly relevant to the issue of whether the presence of maize indicates its local production is the extensive record of anthropogenic plants, many of which were field weeds.

We have good samples today from Princess Point, Clemson's Island, Owasco, Mahikan, Monongahela, Glen Meyer, Neutral, Huron, and St. Lawrence Iroquois sites, to name a few. All represent groups developing, or with, an intensive maize-based system. Although the record is becoming more comprehensive, when and how intensification occurred is far from being answered. Most of the papers acknowledge that it appears to have been time-transgressive, being earlier in the west than in the east. For the most part, no one has confirmed the notion that a form of horticulture similar to the system in the Midwestern Early and Middle Woodland existed before maize was introduced. George and Dewar (Chapter 8) raise the possibility of *Chenopodium* production before the introduction of maize in the Northeast. The early northeastern cucurbit suggests to Asch Sidell that gardening was going on in the Middle Holocene, but complementary lines of evidence are required to confirm this. Nevertheless, Hart and Asch Sidell's (1997) hypothesis that maize and other cultigens were adopted into an existing system of plant husbandry in some areas of the Northeast must be tested if we are to understand the late prehistoric shift to horticulture there. In northeastern Japan where I have been working on a similar problem, data indicate that a similar process actually took place there, and in a north temperate situation not unlike that found in the Northeast (Crawford 1992, 1997). Finally, maize has been AMS-dated to as early as cal 1,500-1,400 B.P. in the Northeast (Crawford et al. 1997).

We are not yet in a position to explain the process of agricultural intensification. It may be linked to the evolution of northern tolerant maize, although Fritz has indicated that by 1,850 to 1,450 B.P., maize had already become adapted to temperate zones (Fritz 1990:490). King tries to link intensification to climatic amelioration and population growth. Yet such minimalist proximate causes are weak explanations for primary agricultural origins and likely for secondary origins too. I'd like to see how they might work in the Northeast. In Ontario, population pressure seems not to have stimulated the adoption of maize production; reduced crisis mortality apparently led to population growth after A.D. 900 (Warrick 1983:411). Population pressure as a cause for agricultural origins has not been a particularly useful explanatory device in general (Bronson 1975; Hassan 1975; Polgar 1975a, 1975b; Price and Gebauer 1995). Furthermore, climate as a determining factor has been criticized thoroughly over the years (Price and Gebauer 1995). In Ontario, the Medieval Warm Epoch has left no strong signature in the pollen record (Crawford et al. 1998), although elsewhere in the Northeast its impact may be visible in pollen records. The sociopolitical context of the process is an important consideration as well, and even this context is difficult to assess (Crawford and Smith 1997; Snow 1996). Given this complex situation, we are currently exploring other conditions in which intensification occurred. Just one set of conditions is the floodplain setting and how people interacted with floodplain dynamics. This is particularly interesting in view of Midcontinent processes that led to plant domestication and the rise of plant husbandry (Crawford et al. 1998; Smith 1992).

Crops do not seem to have become important in the Late Woodland in Maritime Canada. However, the ethnohistoric record indicates that although only tobacco was grown in the Maritime region at the time of European contact, maize husbandry may have briefly appeared only to be abandoned (Leonard 1996). Plant remains have been reported from at least 15 sites in Nova Scotia and New Brunswick, and none include cultigens (Lackowicz 1991). The Melanson site in Nova Scotia, a prehistoric Mi'kmaq occupation, has been explored periodically for 50 years (Nash et al. 1991). Among the 514 identified seeds from 9 flotation samples are 4 types of fleshy fruits as well as sumac, knotweed, wood sorrel, 2 grasses, and a sedge (Deal 1990). The Skull Island burial site on a small island in coastal New Brunswick is the subject of a doctoral dissertation (Leonard 1996). From this small site, 26 taxa of plant remains have been identified in the 384 liters of floated soil. These include small seeds of fleshy fruits and herbaceous plants as well as nuts and 75 g of carbonized groundnut (*Apios americana*) tubers. In addition, some charred bread-like material was recovered. Rather than being made from plant material, isotopic analysis indicates that the constituents of the bread-like material have a marine origin, possibly quahogs (*Mercenaria mercenaria*) (Leonard 1996:142). Leonard has argued that the plum pits from Skull Island are evidence that the range of Canada plum (*Prunus nigra*), not indigenous to the area, was being extended by the ancestors of the Mi'kmaq (Leonard 1996). Leonard has also reviewed evidence for potential Mi'kmaq management of groundnut. So despite the lack of maize and other well-known crops, the palaeoethnobotany of the Canadian Maritime region has considerable potential for research on a number of plant-people interrelationship issues.

Bodner's paper (Chapter 3) on sunflower in western New York is a welcome assessment. Until now, we have not had a synthetic treatment of northeastern sunflower. Bodner notes a general expansion of its range north to Ohio and Indiana bordering the Northeast by 1050 B.P.. The possibility that sunflower was in Michigan by 3,000 B.P. at the Eidson site needs to be evaluated though (Parker 1984). For now, this early report is anomalous. No sunflower earlier than Glen Meyer is known in Ontario (Ounjian 1998). The collection of sunflower achenes, nearly all uncarbonized, from New York is mainly from burials. In contrast, the entire archaeological sunflower collection in Ontario is from occupation sites. They are recovered regularly from nearly every Late Woodland site in the province. As Bodner points out, sunflower is not common in any single context. There is one exception, however. A mass of achenes that appeared to be still attached to the sunflower head was recovered from a pit at the Lawson site (Crawford and Smith in prep.; Ounjian 1998). The size ranges for 140 measured achenes from New York is narrower than the range for 1,079 measured specimens from Ontario. The achenes from Late Woodland Ontario sites are similar in size (mean length of about 8 mm) to Early and Middle Woodland achenes in the Midcontinent (Crawford and Smith in prep.). Without mean achene sizes for the New York samples, it's hard to tell if they, too, are smaller than are their contemporaries in the Midcontinent. At any rate, the Ontario Late Woodland sunflower population does not fit the model of increasing size through time. This is an issue that needs to be examined. It may relate to the shorter growing season in the north, other growing conditions, or a unique variety of sunflower growing in the area, perhaps for its oil rather than for its grain potential (Crawford and Smith in prep.). With the extraordinary resource of uncarbonized archaeological achenes from New York, DNA analysis could help resolve the problem.

Finally, Hart (Chapter 4) challenges several generally accepted notions about the age of the maize, beans, and squash triad recovered from the Roundtop site, New York. He returns to the original field notes for part of his reassessment. More importantly, he reports AMS dates on Roundtop cultigens for the first time. The earliest maize at Roundtop is about 830 B.P., not too far off what we had thought. The 660 and 320 B.P. AMS dates on beans will disappoint some, but the case to eliminate the 950-850 B.P. dates for the maize, beans, and squash triad at Roundtop is strong. This study, along with Conard et al. (1984), is an example of how important it is to reevaluate cultigen remains and their associated dates, particularly if the remains have not been AMS-dated. For the moment, we do not know how early the triad of maize, beans, and squash came together in the Northeast. In Ontario, the earliest association of the triad appears during the Glen Meyer period (c. 800-650 B.P.) but just how early the three crops were grown together in this period we do not know. Hart may get into trouble examining Ritchie's motives for pushing early dates for the triad of maize, beans, and squash at Roundtop, but given the historical importance of the site, he provides some insight as to how we came to understand the Roundtop site as we did.

Palaeoethnobotany in the Northeast is fast becoming a challenging research area. Many issues are finally being examined because of the more regular application of flotation, but much more work remains to be done. The spread of cultigens and the development of agriculture are issues common to the region and the Midcontinent, although evidence of indigenous domestication in the former is, as yet, absent. However, we should not lose sight of the relationship between wild and weedy plants on the one hand, and people on the other. This relationship has a long, rich history in the Northeast. Yarnell (1964) raised a series of questions regarding plants and people in the region that are important to reflect upon today. Unfortunately, some of these questions seem to have been lost in the pages of an older and, at times, forgotten literature. Yarnell (1964) saw value in exploring anthropogenesis and the use of disclimax vegetation, plant range modification, small seeds as food, and exploring the extent to which archaeological plant remains correspond with the ethnohistoric record in addition to the cultigen and agriculture issues. Other productive areas of inquiry that interest me include forager-farmer interaction, subsistence ecology, site-formation processes, and the extensive medicinal aspects of plants, to name a few. Despite the many contributions made to date, the discipline in the Northeast is still young, so I anticipate considerable progress in the future.

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