EARLY HOLOCENE OCCUPATION AT THE BLACKMAN STREAM SITE, CENTRAL MAINE

David Sanger
Department of Anthropology and
Institute for Quaternary Studies
University of Maine (Orono)

William R. Belcher
Department of Anthropology
University of Wisconsin (Madison)

and

Douglas C. Kellogg
Department of Anthropology
Center for Archaeological Research
University of Delaware

ABSTRACT

Recent research at the Blackman Stream site (74-19) has revealed a cultural sequence ranging from the Late Paleoindian period to the Historic period. Assemblage 1, representing the Late Paleoindian period, includes lithic debitage and a parallel-flaked projectile point fragment recovered from 217 cm below the ground surface. This assemblage occurred 1 m below a buried, former land surface which has been dated to ca. 8000 years B.P. This represents the first stratigraphically dated context of a recognizable Late Paleoindian diagnostic artifact in the State of Maine. Assemblage 2 is associated with the buried, former land surface approximately 1 m below the present land surface and dates to approximately 8000 years B.P. Assemblage 2 includes bifaces, full-grooved gouges, adzes, and crude, slab-like choppers, in addition to felsite conical and tabular cores. Both these assemblages contribute significantly to our knowledge of the early culture history of the Penobscot River valley.

INTRODUCTION

This paper describes the results of work undertaken at the Blackman Stream site (site 74-19 in the Maine State prehistoric numbering system). The site has produced evidence of human occupation from the Late Paleoindian period to the twentieth century. Here, we focus on the early portion of the sequence.

The Blackman Stream site is situated on the north side of the confluence of Blackman Stream and the Penobscot River in the town of Bradley, Maine (Figure 1). The site was tested during a phase I survey for the proposed Basin Mills hydroelectric project; additional excavation took place in a phase II testing operation conducted in 1987

Early Holocene Occupation in Northern New England
Occasional Publications in Maine Archaeology 9 (1992)

(Belcher and Sanger 1988; Sanger 1984). Archaeological investigations in the Basin Mills study area were directed by Sanger. Kellogg supervised the phase II field work at Blackman Stream, while Belcher coordinated the analysis.

There are numerous Late Archaic and Ceramic period sites located on the banks of the Penobscot River and its tributaries. Despite the heavy toll of sites due to 200 years of Euro-american activities, recent surveys have identified 109 sites between Bangor and the mouth of Sunkhaze Stream, a distance of 24 kilometers (Fig. 1). However, few of these sites contain cultural deposits demonstrated older than 5000 B.P.

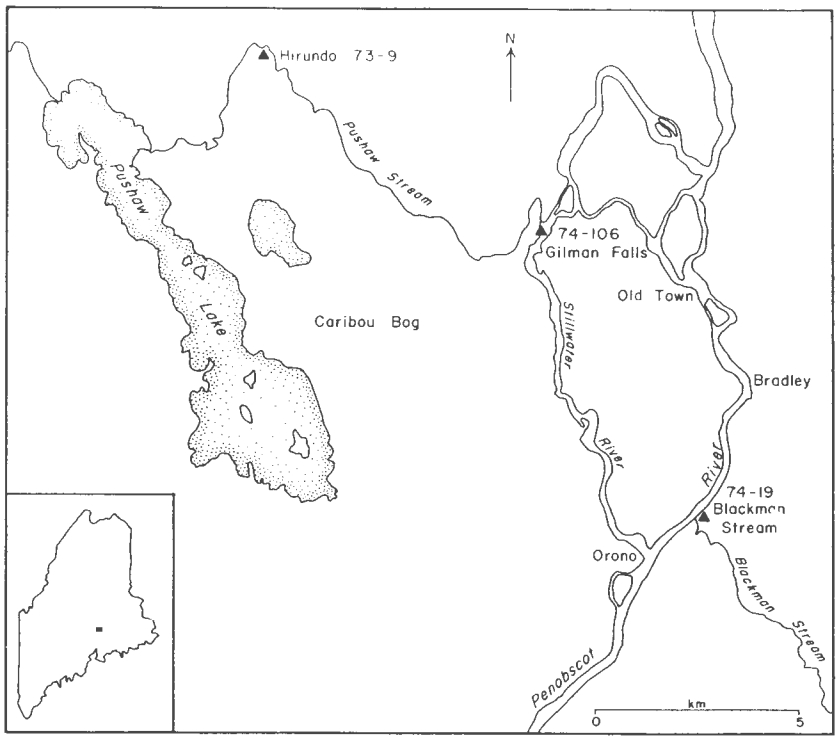

Figure 1. Map of the Penobscot River valley near Orono showing locations of the Blackman Stream, Gilman Falls and Hirundo sites.

The Blackman Stream site has been known since the turn of the century. Walter B. Smith (n.d.) regularly collected "Mr. Moulton's cornfield" beside Blackman Stream. More recently, Herbert R. Dickey, Jr., recovered a number of artifacts associated with red ocher burials of the Moorehead burial tradition (Sanger 1973). Modern interments in the adjoining Knop Cemetery revealed additional red ocher burials.

The presence of an early component at Blackman Stream was suspected on the basis of projectile points in the James Applegate collection from the site. Included with typical Late Archaic and Ceramic period artifacts were two points reminiscent of the Neville-Stark series described by Dincauze (1976) from the Neville site in New Hampshire.

THE BLACKMAN STREAM SITE

Description

The Blackman Stream site extends 120 m along the Penobscot River, upstream from the confluence, and back to Route 178 (Figure 2), encompassing approximately 5,570 square meters. During the phase I survey, the area was surface-collected and tested by shovel test pits, two 1.0 m x 1.0 m pits, and a single 1.0 m x 2.0 m test unit placed in a depression in the center of the site. Below the thickened plow zone and an area of disturbance, the latter excavation unit revealed compact silty sand overlying a lag deposit of large, rounded boulders. Associated with the silty sand were a number of parallel-sided, felsite flakes, and tabular cores of a technology not recognized in Late Archaic period assemblages. On the basis of the potential for Middle Archaic and /or Early Archaic period components, further research was recommended (Sanger 1984).

In 1987, over 50 square meters and two long backhoe trenches were excavated at the Blackman Stream site (Figure 2) (Belcher and Sanger 1988). Analysis of the test unit and backhoe stratigraphy by consulting geologist Alice Kelley revealed a series of overbank flood episodes that infilled an abandoned Penobscot River channel. Deposition, which was rapid initially, subsequently slowed between 8000 and 7000 B.P., and from 7000 B.P. to the present has accumulated less than a meter. Underlying the Holocene flood deposits are outwash gravels and till, resting on Silurian-Ordovician phyllites of the Vassalboro Formation (Brady 1982; Osberg et al. 1985; Thompson and Borns 1985).

Several excavation units in the depression area of the site located a dark-stained stratum (IV)

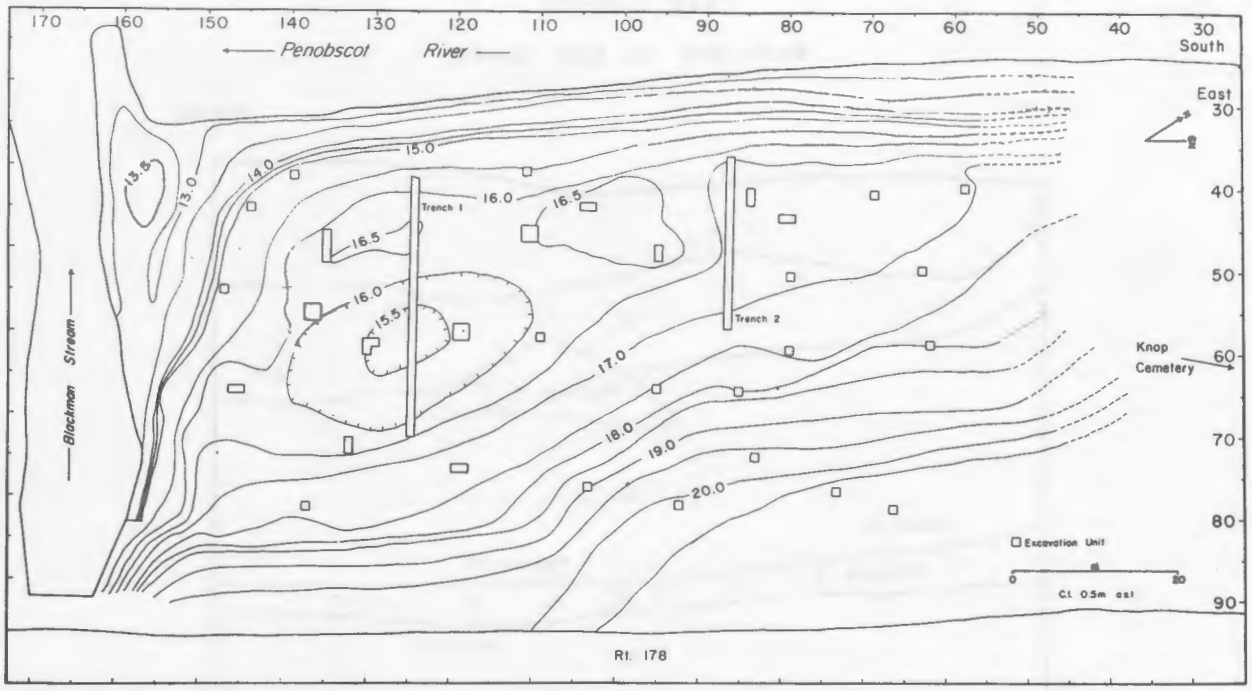

Figure 2. Blackman Stream site (74-19) topography and excavation plan.

about a meter below the ground surface (Figure 3). This stratum is referred to as the "buried surface." The stratum represents a weakly developed forest soil, subsequently leached. Associated are fire-cracked rocks, flakes, cores, and other artifacts, together with fire hearths and charcoal. Three samples of the charcoal produced radiocarbon dates that confirm the anticipated early nature of the deposits. Charcoal from features clearly associated with the buried surface yielded dates of 8360 ± 150 years B.P. (Beta-21681), 7760 ± 130 years B.P. (Beta-22125) and 7400 ± 140 years B.P. (Beta-21682). All dates are uncalibrated values.

Excavation continued in many test units until the basal gravel and/or till deposits were encountered. In test unit 136S 56E, at a depth of 217 cm below the ground surface and 1 m below the buried surface, a parallel-flaked projectile point fragment was found in a compact, iron-stained sand.

Cultural Assemblages

Assemblage 1 consists of the parallel-flaked projectile point fragment and a number of flakes recovered from comparable stratigraphic contexts in other test units at the site. As stated above, the point fragment was found 1 m below the buried surface and associated artifacts. This suggests that the point is older than the ca. 8000 year B.P. age for the buried surface.

The point is a base fragment that is parallel-flaked and finely worked (Figure 4). Pressure retouch occurs along the sharp, lateral edges; some flake arises are ground smooth on both faces. The material is a weathered, dark gray chert.

Felsite flakes were recovered from silt lenses above gravel lag deposits in different excavation units. Four of these flakes are bifacial thinning flakes. These flakes are *not* directly associated with the biface; however, they occur in stratigraphically similar deposits and therefore have been tentatively grouped as Assemblage 1.

Assemblage 2 consists of artifacts associated with the buried surface; the radiocarbon dates listed above pertain to these artifacts. The assemblage incorporates specimens that occur just below, on and just above the buried surface. Based on the three radiocarbon dates, there was a period of relative soil surface stability for up to 1,500 years, during which time a forest soil horizon developed and people camped on the riverbank. The assemblage is not considered to represent a single occupation in the traditional sense of a short-lived human presence. It may, therefore, be a mistake to assign it to a named complex or tradition *as if*

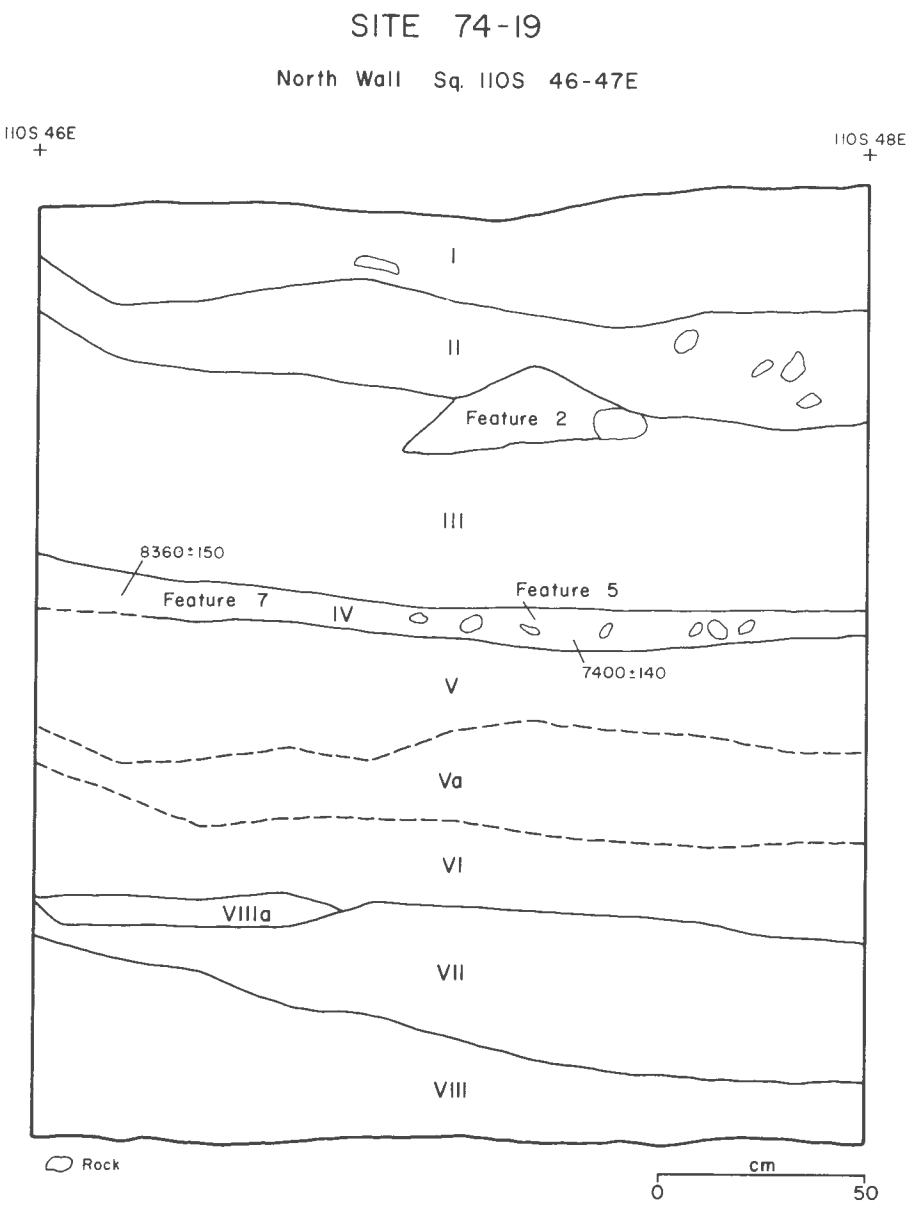

Figure 3. North wall profile of unit 110S, 46-47E at the Blackman Stream site. Stratigraphic descriptions as follow:

I: very find sand, silt and clay; very dark grayish brown 10YR 3/2
II: very fine sand and silt; yellowish brown 10YR 5/6
III: fine to medium sand; coarsens upward; olive brown 2.5YR 4/4
IV: paleosol, very fine sand and silt with extensive charcoal staining
V: very fine sand and silt; yellowish brown 10YR 5/6 (mottles)
Va: very fine sand, silt and clay; yellowish brown 10YR 5/6
VI: very fine sand and silt, very compact; light brownish gray 10YR 6/2
VII: medium to coarse sand; dark yellowish brown 10YR 4/4 (Fe mottles)
VIII: medium to coarse sand and gravel; compact
VIIIa: gravel

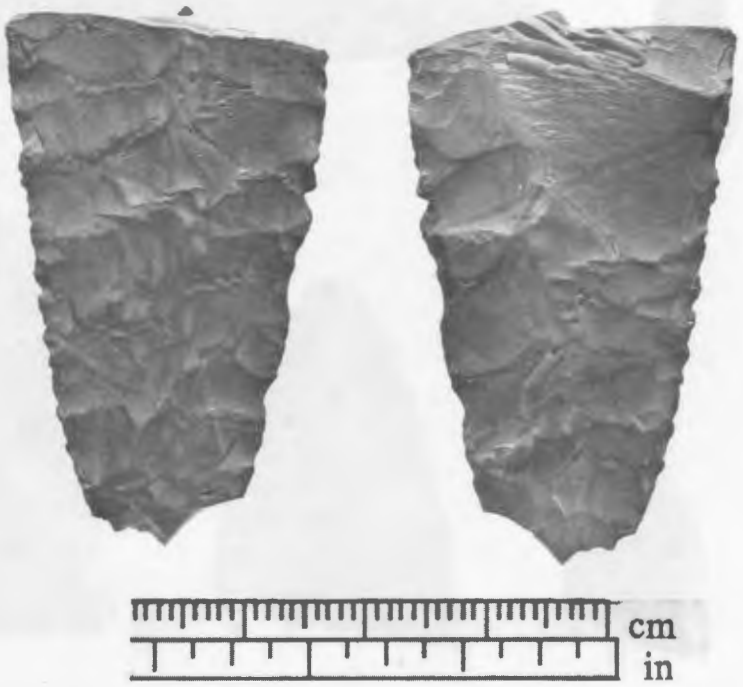

Figure 4. Parallel-flaked biface base from the Blackman Stream site. Biface recovered from unit 136S, 54E at a depth of 217 cm below ground surface.

it constituted a single cultural assemblage. The nature of the assemblage needs to be refined further by more extensive excavation and stratigraphic analysis. Assemblage 2 includes the artifact types listed below.

Flaked Biface Fragments

Three biface tip fragments and a single bifacially retouched flake are present. Two specimens are large felsite biface fragments with rounded tips (Figure 5f, g). The third biface fragment is a small, finely flaked, dark gray quartzite specimen with a pointed tip (Figure 5d). The fourth specimen is a relatively small felsite flake with minimal bifacial retouch.

Flaked Uniface

A single felsite uniface occurs in Assemblage 2 (Figure 5e). This artifact is a large flake with unifacial retouch along a single lateral edge.

Ground Stone Fragments

Two fragmentary examples of ground stone tools are associated with the buried surface: 1) a poll fragment of a full-grooved gouge of volcanic stone that is heavily worn and damaged; and 2) a bit fragment from a finely ground and bevelled adze (Figure 5a, b).

Pecked Rod

Assemblage 2 also includes a single metasedimentary, elongate river cobble that has been modified by grinding and pecking along most of its surfaces (Figure 5c). The pecking is confined to one end and along a single lateral edge.

Pecked Stone

Two stones exhibit discontinuous pecking on their surfaces; raw materials include quartzite and basalt.

"Slab-Like choppers"(?)

Ten artifacts exhibit extensive modification by battering and flaking (Figure 6). Most of the specimens are lithic spalls that have been predominantly modified along a single edge. Lithic materials include fine-grained volcanic stone (n=5) and phyllite (n=5). It is possible that these specimens

Figure 5. Ground stone and flaked stone artifacts from the buried surface at the Blackman Stream site: a, adze bit fragment; b, poll fragment of a full-grooved gouge; c, pecked stone rod; d,f,g, biface fragments; e, uniface.

were "preforms" for ground stone tools. Alternatively, they may be functioning implements.

Cores

Two types of cores are recognized from Assemblage 2: those with a particular type of prepared platform, referred to as "tabular cores," and others called "conical cores." Tabular cores have a striking platform prepared by the removal of large flakes that creates a flat surface about 90 degrees to the dorsal surface of the core. Most core specimens of this type retain much of their cortex. Nineteen tabular cores occur in Assemblage 2. Felsite is the predominant lithic material (n=17), with quartz (n=1) and fine-grained volcanic material (n=1) also present (Figure 7).

Four of the cores are "conical cores." They exhibit flaking and battering from several different striking platform areas. All are felsite.

The felsites of the Assemblage 2 cores differ substantially in appearance from the usual felsites of green groundmass and small, white phenocrysts (so-called Kineo-Traveller felsite or rhyolite) common throughout the region. The dominant felsite of Assemblage 2 possesses white or gray flow-banding in a light green to gray groundmass.

Battered Cobbles

Six specimens exhibit minimal modification including some battering, pecking and flaking. Fine-grained volcanic stone (n=4), basalt (n=1) and argillaceous stone (n=1) are the lithic raw materials.

Hammerstones

Twenty-four hammerstones occur in Assemblage 2. All exhibit battering and flaking along a number of their edges and surfaces. Most appear to be river cobbles; much of the original cortex remains on these specimens. Raw materials in-

clude: quartzite (n=12), fine-grained volcanic stone (n=6), felsite (n=4), basalt (n=1) and argillaceous stone (n=1).

Flakes

Assemblage 2 contains 1,584 flakes. Felsite (n=1,134; 72%) represents the dominant raw material used during the Early/Middle Archaic period occupation. Other raw materials include fine- and coarse-grained volcanics (n=233; 15%), quartz (n=118; 7%) and chert (n=99; 6%). All stages of the reduction sequence occur in the sample, including decortification flakes and unifacial/bifacial reduction flakes.

DISCUSSION

The early levels at Blackman Stream have the potential to add quite substantially to our understanding of Penobscot River culture history. In addition, these finds may contribute to issues of broader interest.

Recently, the presence of parallel-flaked bifaces in northeastern North America has been reviewed (Benmouyal 1987; Davis and Christianson 1988; Doyle et al. 1985). These distinctive points, which bear resemblances to Plano specimens found farther west, are inconclusively dated.

In the Gaspé region of Québec, Benmouyal excavated a number of specimens in several sites. At Sainte-Anne-des-Monts, a single date of 5960 ± 100 C-14 years B.P. (Qu-347) was obtained. Benmouyal (1987:107, personal communication 1987) indicates that this sample did not receive nitrate pre-treatment to remove potential rootlet contamination. Thus, the date may be too young, as might be inferred from the form and technology of these points, which Doyle et al. (1985:15) suggest date to between 8000 and 10,000 B.P.

Shown pictures of the Blackman Stream specimen, Benmouyal (personal communication 1988) noted that the form and material are very similar to the Sainte-Anne-des-Monts bifaces. The senior author, who has had the opportunity to examine the Gaspé artifacts, also concludes that there is a remarkable degree of similarity, to the extent that temporal synchroneity would be anticipated.

Further west in Ontario, Canada, Julig et al. (1990) date the Late Paleoindian (Plano) Cummins site to zone 2 of the local pollen zonation, roughly 10,000 to 8000 B.P. Zone 2 vegetation is predomi-

Figure 6. Slab-like choppers from the buried surface at the Blackman Stream site.

Figure 7. Cores from the buried surface at the Blackman Stream site.

nately spruce with increasing amounts of birch and jack pine. Occupation at the Cummins site continued into pollen zone 3 times, post 8000 B.P., when spruce was replaced gradually by pine and birch. The Cummins site and its associated paleoecological research constitute an important data set for any overview of the Late Paleoindian culture(s) of the Northeast.

It is unfortunate that the Sainte-Anne-des-Monts assemblage is burdened with an equivocal radiocarbon date. The evidence from Blackman Stream suggests that, unless we are prepared to believe in some sort of cultural retardation in eastern Québec, a hypothesis we regard as highly unlikely, the parallel-flaked points of the Northeast do represent a Late Paleoindian period manifestation that dated to greater than 8000 radiocarbon years B.P.

In the Northeast, plots of artifact distributions in the period immediately following the disappearance of the Paleoindian fluted points illustrate a well-known pattern (cf. Dincauze and Mulholland 1977). Those specimens which Dincauze (1976) has referred to as representatives of the Atlantic Slope Archaic diminish in numbers north of southern New England. Dincauze and Mulholland (1977:450) noted the correspondence between the southern-style bifaces and the 20% oak isopoll, and pointed out that the ecotone north of that isopoll was probably close to the limit of the adaptive pattern, a lifestyle that involved the hunting of white-tail deer.

Currently, a near mutually exclusive distribution pattern exists between the parallel-flaked, Plano-like bifaces of Maine and adjacent Canada and the Early Archaic forms of the Atlantic seaboard. The pattern suggests different cultural origins and the possibility of a different adaptation to the forests of the Northeast.

A synthesis of Holocene pollen diagrams from 18 eastern North American sites demonstrates the clear separation between the conifer-dominated northern forests and the oak-hickory hardwood forests of the south (Jacobson et al. 1987). Figures 8-11, prepared in consultation with George Jacobson (personal communication 1991), graphically

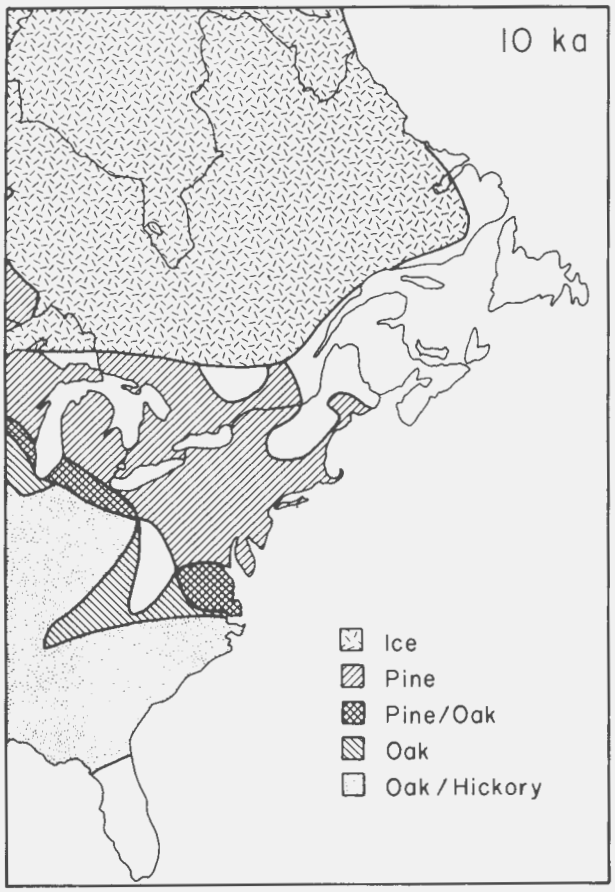

Figure 8. Selected tree taxa distributions at 10 ka in northeastern North America— Pine, Oak, Hickory (figure modified from Jacobson et al. 1987).

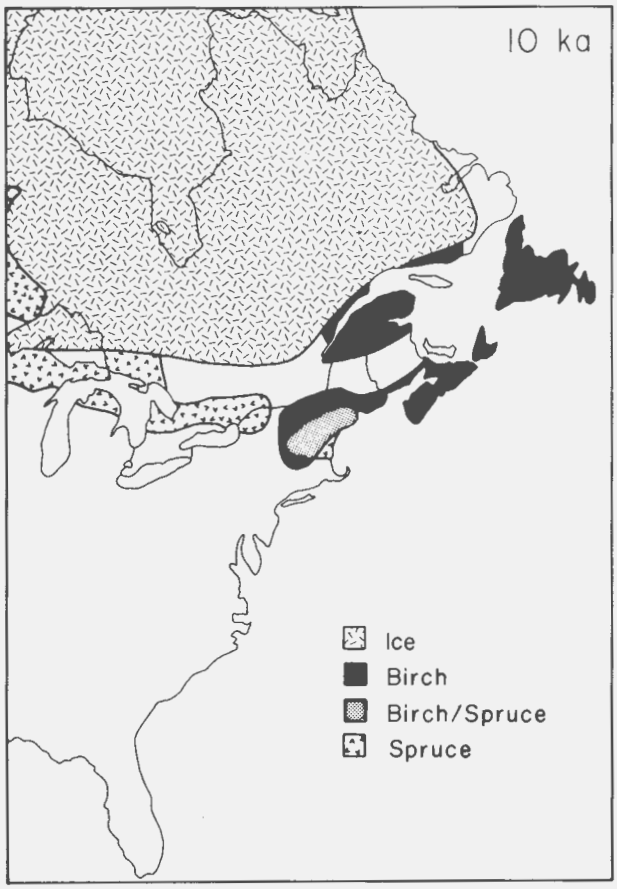

Figure 9. Selected tree taxa distributions at 10 ka in northeastern North America— Birch and Spruce (figure modified from Jacobson et al. 1987).

illustrate the major taxa at two key times— 10,000 and 8,000 years ago (10 ka and 8 ka)— for a discussion of Early Archaic adaptations. It should be noted that the vegetation maps are designed to highlight those taxa whose abundance in the various pollen diagrams reaches a level that would suggest a significant presence on the landscape.

At 10 ka much of Maine and some of New Brunswick was in a colonizing mode where no one taxon could be considered dominant, hence the uncolored area on the reconstruction maps at 10 ka. Reference to the original maps (Jacobson et al. 1987:Plate 1) indicates that by 10 ka the 5% oak isopoll ran through central Maine and south. By 8 ka the 5% isopoll had scarcely shifted; however, the 20% oak isopoll had advanced into much of southern New England and it had reached 40% in Massachusetts. In other words, while there was a steady northward migration of oak into southern New England between 10 ka and 8 ka, the percentage of oak pollen is virtually unchanged in most of Maine. Spruce at 10 ka was only at 5% in northern Maine, although it reached higher levels in southern New England. By 8 ka spruce had all but left southern New England and was found from central Maine northward. With the exception of a small pocket around Penobscot Bay in Maine, pine was a minor taxon throughout the study area but increased rapidly in all areas by 8 ka.

For people, these taxa and their distributions suggest only possibilities, not absolutes. Most impressive is the low incidence of oak in the central Maine area and north, and the substantial increase in oak pollen in southern New England where it reached 40% of all pollen by 8 ka. For all practical purposes these were oak forests which should have had a substantially enhanced carrying capacity for people compared with more northern forests.

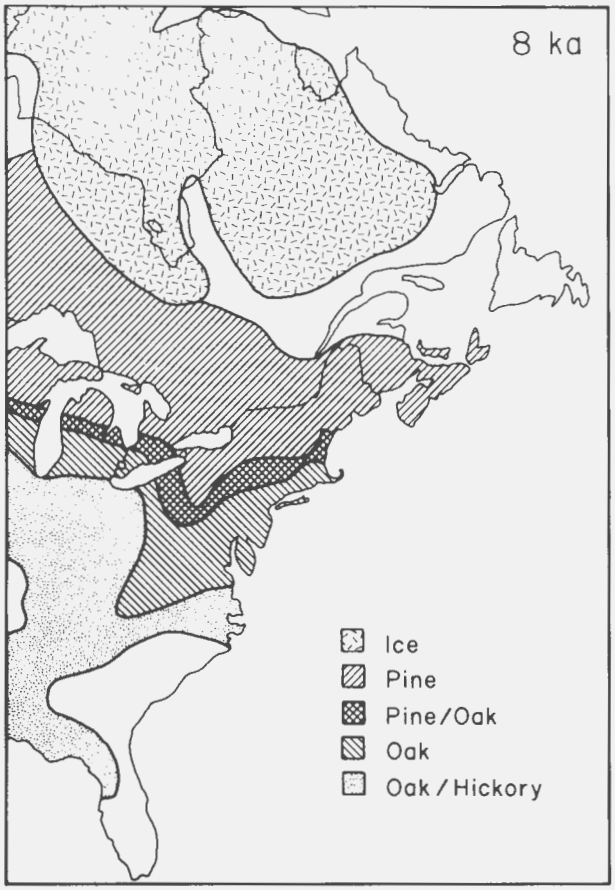

Figure 10. Selected tree taxa distributions at 8 ka in northeastern North America—Pine, Oak, Hickory (figure modified from Jacobson et al. 1987).

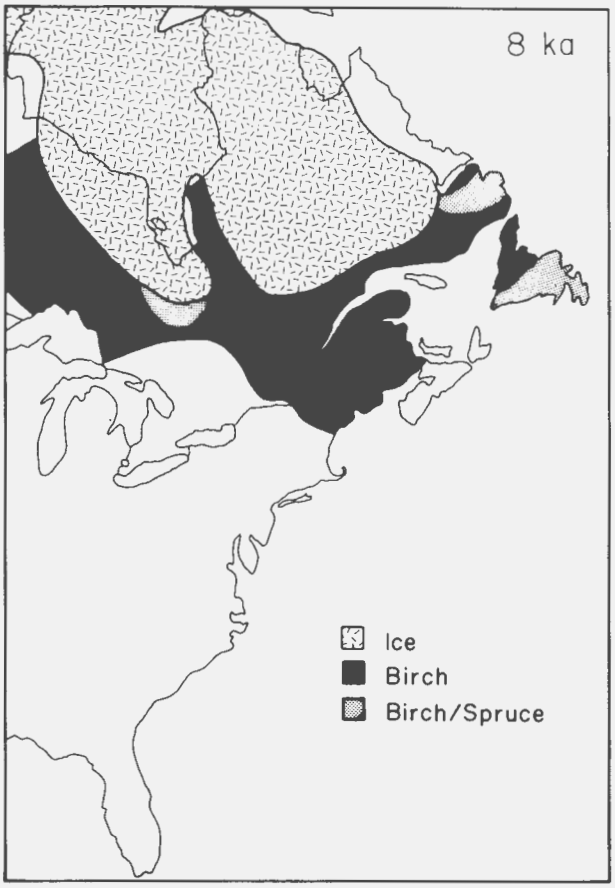

Figure 11. Selected tree taxa distributions at 8 ka in northeastern North America—Birch and Spruce (figure modified from Jacobson et al. 1987).

Earlier, overly simplistic claims for presence or absence of Early Archaic populations based on the forest communities are clearly in need of revision. However, the general association between the Late Paleoindian points of the north and the oak-poor, conifer-birch forests seems evident. At this point, to discard totally the human presence-vegetation model is akin to the proverbial baby and its bath water. As we continue to recover more evidence for human activity during the early Holocene we must integrate the latest vegetational data.

What the vegetation history means in terms of human adaptation remains to be discerned. People, of course, adapt both to the vegetation and to the animals supported by that vegetation, while other resources, especially fish, may have little, if anything, to do with vegetation cover. The paucity of faunal remains in many of the northern sites complicates any specific statements regarding adaptations. Knight's (1985) innovative research on the taphonomy of bone in northern sites with acidic soils is particularly relevant. Based on controlled laboratory tests, Knight found that over-representation of small mammals, particularly beaver and muskrat, is a hazard associated with such sites. Remains of large mammals, such as the deer family, are likely to go unrecognized because of extreme fragmentation and bone loss.

Modern forests consist of taxa in quantities that may not provide suitable analogues for past forests. Consequently, it is dangerous to project a subsistence pattern based on inferred fauna and flora in modern forests. Nevertheless, the modern spruce-birch zones tend to be a moose, beaver, muskrat, fish, and fowl dominated faunal assemblage relatively depauperate in terms of plant resources for humans. By contrast, the modern oak-hickory hardwood communities support white-tail

deer and other mast food consumers, in addition to a wide variety of floral resources directly consumed by people.

Whether or not there is significance in the overlapping distribution of the parallel-flaked points and the coniferous forests constitutes a topic for further research. It will require much tighter chronological controls and more complete excavation of components in the transition zone between the major tree taxa in order to accept or reject a functional hypothesis.

Assemblage 2 is also significant. It indicates that around 8000 B.P. the following artifact classes were present in the Penobscot valley: bifaces of yet unknown form and size; full-length grooved gouges; adzes; and crude, slab-like choppers reminiscent of those from the John's Bridge site in Vermont (Thomas and Robinson 1980). In addition, there are felsite cores, both conical and tabular, and a low percentage of quartz flakes. Unfortunately, none of the above can be assigned *exclusively* to the 8000 B.P. period with confidence on the basis of our current understanding of regional prehistory. Additional examples of complete specimens in good context is required.

While every Assemblage 2 artifact can be duplicated at the nearby Hirundo site (Sanger et al. 1977), the context there is ambiguous. Elsewhere in the vicinity, related components occur at six or more sites. One of these, the Gilman Falls site (74-106) located at the mouth of Pushaw Stream (Figure 1), has an extensive assemblage currently under analysis.

CONCLUSION

For two decades archaeologists in the Northeast have argued the merits of explaining apparently low site populations by a paucity of people in the area. A full review of the history of argumentation is beyond the scope of this brief note; however, we now have incontrovertible evidence that at least some people were in the central Maine area prior to the abundant evidence for human presence after 5000 B.P. (see also Petersen et al. 1986).

On the basis of the current data several hypotheses can be advanced:

1. The discrepancy in site numbers before and after 5000 B.P. is an accurate reflection of the situation; that is, human populations were indeed lower, but not absent.

2. The history of major river development has resulted in differential site preservation such that the existing data are not indicative of the real situation.

3. Too little research has been conducted in deep alluvial sediments, and further work can be expected to demonstrate much higher population numbers.

4. Early and mid-Holocene peoples used the major valleys but focused activities in the glacial lakes and wetlands which then had a higher carrying capacity (Nicholas 1988) than the surrounding countryside. As a result, riverine sites are understandably scarce.

Regardless of which of these hypotheses prove to be most acceptable as additional evidence accumulates, the data from the Blackman Stream site, in association with that from other stratified sites reported in this volume, indicate that we can no longer express the argument in simplistic, polarized terms. Clearly, people were here; but, in what numbers, and with what kinds of adaptive strategies remains to be determined.

ACKNOWLEDGEMENTS

Research at the Blackman Stream site is part of the Basin Mills Project, a larger contract archaeological project being conducted by the University of Maine for Bangor Hydro-Electric Company. We extend our thanks to the Town of Bradley for allowing excavation on the land around Blackman Stream. Crew members, too numerous to be thanked individually, braved the poison ivy which grows in abundance in the Penobscot River valley and are thanked for their perseverance. George L. Jacobson, Jr. (University of Maine) provided much appreciated advice on paleoflora and kindly allowed us to modify the flora distribution maps. Stephen A. Bicknell drafted the figures and photographed the artifacts. We would also like to thank the editors for the invitation to contribute to this volume at the last minute.

REFERENCES CITED

Belcher, William R., and David Sanger

1988 *Phase II Report on the Archaeology of the Basin Mills Project.* University of Maine Institute for Quaternary Studies and Department of Anthropology. Submitted to Bangor Hydro-Electric Company, Bangor.

Benmouyal, José

1987 *Des Paléoindiens aux Iroquoiens en Gaspésiè: Six Mille ans d'Histoire.* Ministère des Affaires Culturelles, Direction de l'Est du Québec, Québec.

Brady, K.B.

1982 The Quaternary Stratigraphy of a Multiple-Till in East Central Maine. Unpublished M.S. thesis, Department of Geological Sciences, University of Maine, Orono.

Davis, Stephen A., and David Christianson

1988 Three Paleo-Indian Specimens from Nova Scotia. *Canadian Journal of Archaeology* 12:190-196.

Dincauze, Dena F.

1976 *The Neville Site: 8000 Years at Amoskeag.* Peabody Museum Monographs 4. Harvard University, Cambridge.

Dincauze, Dena F., and Mitchell Mulholland

1977 Early and Middle Archaic Site Distributions and Habitats in Southern New England. In *Amerinds and Their Paleoenvironments in Northeastern North America,* edited by W. Newman and B. Salwen, pp. 439-456. Annals of the New York Academy of Sciences 288.

Doyle, Richard A., Nathan D. Hamilton, James B. Petersen, and David Sanger

1985 Late Paleo-Indian Remains from Maine and Their Correlations in Northeastern Prehistory. *Archaeology of Eastern North America* 13:1-34.

Jacobson, George L., Thompson Webb, and E. C. Grimm

1987 Patterns and Rates of Vegetation Change During the Deglaciation of Eastern North America. In *North America and Adjacent Oceans During the Last Deglaciation,* edited by W. F. Ruddiman and H. E. Wright, pp. 277-288. The Geology of North America, volume K-3. Geological Society of America, Boulder.

Julig, P.J., J.H. McAndrews, and W.C. Mahaney

1990 Geoarchaeology of the Cummins Site on the Beach of Proglacial Lake Minong, Lake Superior Basin, Canada. In *Archaeological Geology of North America,* edited by N. P. Lasca and J. Donahue, pp. 21-50. Geological Society of America, Centennial Special Volume 4.

Knight, James A.

1985 Differential Preservation of Calcined Bone at the Hirundo Site, Alton, Maine. Unpublished M.S. thesis, Institute for Quaternary Studies, University of Maine, Orono.

Nicholas, George P.

1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Postglacial Land Use. In *Holocene Human Ecology in Northeastern North America,* edited by George P. Nicholas, pp. 256-296. Plenum Press, New York.

Osberg, Philip H., Arthur M. Hussey, and Gary M. Boone (editors)

1985 *Bedrock Geologic Map of Maine.* Maine Geological Survey, Augusta.

Petersen, James B., Nathan D. Hamilton, David E. Putnam, Arthur E. Spiess, Robert Stuckenrath, Cynthia A. Thayer, and Jack A. Wolford

1986 The Piscataquis Archaeological Project: A Late Pleistocene and Holocene Occupational Sequence in Northern New England. *Archaeology of Eastern North America* 14:1-18.

Sanger, David

1973 *Cow Point: An Archaic Cemetery in New Brunswick.* Archaeological Survey of Canada Paper 12. National Museum of Man, Ottawa.

1984 *An Evaluation of the Cultural Resources in the Basin Mills Study Area.* University of Maine Institute for Quaternary Studies and Department of Anthropology. Submitted to E. C. Jordan Company, Boston.

Sanger, David, Ronald B. Davis, Robert G. MacKay, and Harold W. Borns
1977 The Hirundo Archaeological Project-- An Interdisciplinary Approach to Central Maine Prehistory. In *Amerinds and Their Paleoenvironments in Northeastern North America,* edited by W. Newman and B. Salwen, pp. 457-471. Annals of New York Academy of Sciences 288.

Smith, Walter B.
n.d. Unpublished diaries. On file at the Department of Anthropology, Univesity of Maine, Orono.

Thomas, Peter A., and Brian S. Robinson
1980 *The John's Bridge Site: VT-FR-69, An Early Archaic Period Site in Northeastern Vermont.* Department of Anthropology Report 23. University of Vermont, Burlington.

Thompson, Woodrow B., and Harold W. Borns (editors)
1984 *Surficial Geologic Map of Maine.* Maine Geological Survey, Augusta.