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Spring snowmelt in a mountain stream (Eric Pinder).
Inset: A fox visits the summit of Mount Washington on a foggy day (MWO archives).
Introduction
Like an ebbing tide, the glacier pulled back from the region in pulses, occasionally advancing forward a bit to recover old territory. The receding ice blocked the drainage of north- and west-sloping valleys, forming a succession of glacial lakes that lapped directly against the glacier. These ice-dammed lakes seeped away as the ice front receded. Natural dams of glacial sediments impounded other lakes by choking the outlets of the valleys. These lakes survived until erosion breached the dams, spilling out their waters.

It's clear that glaciation shaped the landscape of the White Mountains in many ways. The power of the glacier is reflected today in enormous boulder moraines that drape the valleys and mountainsides. In Part 1 of this series (Windswept, spring 2000) Woodrow Thompson introduced us to the fascinating and sometimes controversial history of the end of the Ice Age in the northern White Mountains. Christopher Dorion picked up the story in Part 2 (Windswept, summer 2000) with the arrival of plants and insects. The story now turns to when and how people arrived in this region and made it their home.

Background
The first people to enter what are now New England and the Maritime Provinces were part of the Clovis culture. Clovis and other closely related cultures are collectively known as Paleoindian. They flourished in the time period immediately before the onset of the contemporary climactic period, the Holocene.

Clovis sites have been found across the entire North American continent, from New Brunswick to California and from Alaska to Costa Rica. The characteristic that binds all of these sites together is the presence of a very distinctive style of spear...
point. This artifact exhibits a lanceolate outline with a groove (often termed a “channel” or “flute”) that extends from the base lengthwise up the body of the point. This morphology requires a specific manufacturing technology and produces a style unique to this early North American culture.

The method of manufacture is so distinctively Paleoindian that even the recovery of a channel flake is often sufficient to identify the artifact—and, by extension, the site from which it was found—as being Paleoindian. An especially good example of this kind of point was found at Intervale in North Conway, not far from the rest stop on Route 16 and in full view of the Presidential Range (Figure 1).

The Paleoindians were the first people to enter the landscape and they must be recognized as pioneers in the strictest sense of the word. They carried with them a complex hunting and gathering subsistence system, supported by an even more sophisticated suite of stone, bone, antler, and fiber technologies. Their stone tool technology is best known, in part, because of the ubiquitous fluted points that have become the hallmark of the culture.

Less dramatic, but potentially more essential, were their distinctive triangular end scrapers—delicately chipped cutting tools made on large, thin flakes and large flensing tools. Other tools made from perishable materials certainly existed but have been preserved only in the rarest of circumstances.

The material culture of the high Arctic Inuit of the Canadian interior—with their bone and ivory harpoons and spears, elaborate fur parkas and mukluks and complex bent wood dogsleds—would be similar in many ways to that of the Clovis peoples. This would be especially true in Canada and the northern part of the United States.

As the Clovis people spread throughout the continent, regional variations in the fluted points developed, undoubtedly reflecting trends within bands as they slowly lost contact with their distant parent groups and began to develop their own separate identities. By careful comparison of the stylistic variations of the tools, we can begin to identify and trace the movements and cultural adaptations of the various offshoots of the Clovis culture. By recognizing stylistic similarities between regions and identifying new
and unique versions of tools, especially among the fluted points, we have the beginnings of a history of how and when Paleoindian people migrated into northern New England. It is to this story that the sites in Jefferson, New Hampshire, have contributed.

The Israel River Complex
In October 1995 a violent windstorm uprooted trees in the northern New Hampshire town of Jefferson. A resident, Paul Bock, an experienced volunteer in the NH State Conservation and Rescue Archaeology Program (SCRAP), seized the opportunity and systematically inspected the bases of some overturned trees, recovering chipping debris from stone tool manufacture and the base of a fluted point. He immediately recognized the significance of the find and notified me. Within days the site (Jefferson I Site) was mapped and additional chipping debris recovered.

Over the next five years, survey and excavations by SCRAP identified four more Paleoindian sites (Jefferson II, III, IV, and V Sites). This cluster of sites is defined as the Israel River Complex (Boisvert 1998, Boisvert & Puseman In Press). It is a highly unusual, possibly unique, Paleoindian manifestation in northern New England.

The five Paleoindian sites are close to one another, and all fit within a half square kilometer. They are near the Israel River, which rises at the north end of the Presidential Range, flowing 25 kilometers west and north into the Connecticut River. The Complex is situated midway between the Connecticut and the headwaters of the Moose River, which flows east into the Androscoggin River. The Israel and Moose Rivers provide one of the few easy east/west passages through the White Mountains (Figure 2).

While these mountains are not especially high by global standards, they are still steep, rugged, and subject to severe weather. The contemporary dangers associated with this demanding landscape and lethally unpredictable weather likely would have been more extreme in the waning years of the Ice Age.

The Complex is perched strategically at the western end of the most convenient route of travel through the White Mountains. It sits on the slope of the valley, facing south/southwest and overlooking the bed of Glacial Lake Israel. All of the sites are situated either near the margin of the former lake or on prominent rises with good vantage points overlooking the lakebed. None are situated on or near permanent streams.

Varve analysis and supporting radiocarbon dates from Cherry Pond indicate that Glacial Lake Israel had drained before the arrival of the Paleoindians. The broad wet lakebed was beginning to fill with alluvial sands eroding from the tills draping the

Figure 2. Location of the Israel River Complex.
valley walls. The first Paleoindian inhabitants of the Israel River Valley appear to have arrived during the peak of what is known as the Younger Dryas cold interval, a thousand years after the lake drained.

The Younger Dryas climactic period is especially interesting. Approximately a thousand years after the exit of the ice, the weather that had been comparatively warm suddenly reverted to glacial-like conditions. This cold climate lasted for a millennium before transitioning rapidly to the familiar climate of recent time.

THREE AMS RADIOCARBON DATES (two from Jefferson II and one from Jefferson III) have been run, but with disappointing results. They range from 9,500 to 8,800 calendar years ago, dates that are unacceptably late for Paleoindian. The charcoal selected for dating appears to have been mixed into the deposits. Consequently we are able to date the complex only by stylistic comparisons of the artifacts with identical versions found in well-dated sites elsewhere. A carbonized seed recovered from a small pit feature at the Jefferson III sites still awaits radiocarbon analysis and represents our last and best hope for a reliable date from the Complex.

Spear points and other distinctive Paleoindian tools have been found at all five sites and, after more than five years of research and excavation, we have found no diagnostic artifacts from any later period.

The projectile points found in the Complex are all fluted (Figure 3). Typologically they may be grouped into two basic styles. The earlier version has parallel sides, indented bases, and flutes that extend barely half the length of the points. These are known as Bull Brook points and are nearly identical to a style known as Gainey from around Lake Michigan and Lake Ontario. The later type is known as Neponset. Neponset tends to be longer and has a slightly indented base, which is flared due to a constriction just above the base itself. It also has extremely long flutes, sometimes extending nearly the full length of the specimen. The Neponset points correspond with the Barnes style, which also occurred in the same geographic range as the Gainey points. An excellent example of the Neponset variety was found at Intervale in North Conway in 1888 and donated to the Smithsonian Institution (Figure 1). Based upon baseline research on the point styles in Ontario (Deller & Ellis 1988), the Israel River Complex fits within a span from about 12,800 to 11,200 calendar years before present (11,000 to 10,000 14C before present).
HAVING ESTABLISHED THE AGE OF the sites in the Complex, the next question is what were the Paleoindian people doing? What were the sites used for?

In archaeology, such questions are always problematic. Biases are created by the preservation of only a small portion of the materials used by the people there. Also, there are no modern equivalents to a hunting culture on a previously uninhabited landscape, living under climatic conditions unique to the end of the Pleistocene. Still, some interpretations can be offered.

The first interpretation is that the sites functioned as encampments for bands of hunter-gatherers. At the Jefferson II site we have excavated an occupational concentration covering approximately 50 square meters, and there is strong evidence for residence by a small band that conducted multiple tasks. Tools for hide processing, clothing manufacture, and manufacture of tools from hard organic materials (bone, antler or wood) have been found in a patterned distribution. Resources were sufficient to sustain at least a small band long enough to make, use, repair, and lose or discard some 50 tools. The Jefferson III site has been less extensively explored, but seems to be very similar.

Hunting was certainly an important activity supported from both of these camps. I infer this from the recovery of fluted point fragments that arrived at the site after having been broken in use, but which were still attached to the shafts or foreshafts. They were then stripped from their shafts, discarded on site, and replaced. Ten of the 14 examples of finished fluted points are basal fragments whose length is shorter than their width, while two other points show evidence of impact fractures, i.e. they were broken when they struck extremely hard surfaces such as a large bone or rock.

Additional evidence for hunting comes from the recently discovered Jefferson IV site. Though barely six square meters of surface have been excavated, we were fortunate to recover a complete fluted point and a well worn flake of stone broken from a large cutting and scraping tool. These two specimens were tested for the presence of animal protein by analysis known as cross-over immunoelectrophoresis (CIEP). Paleo Research Laboratories of Denver, Colorado (Puseman, 2001) tested Archaeology is the body of research that seeks to describe and explain past human culture and behavior on the basis of material remains. These include not only tools, architectural and food remains from the past, but also the impact of human behavior upon the landscape and environment. The challenge for the researcher who investigates the immediate postglacial period in the Northeast is that only a small fraction of the material culture from this period survives. Furthermore, disturbance by plant roots and the burrows of countless small animals have altered the context of these items. In addition, many sites essential to the interpretation of cultural patterns have been disturbed or lost entirely to the effects of later occupations, especially in the modern era. The task is made all the more challenging because we are researching a unique situation—the entry by people into a region of the world for the first time ever.

The interpretation presented here is only partial and tentative. It will be subject to revision as new sites are discovered and additional research is conducted.
the two specimens against antisera from 18 different animal species. The fluted point tested negative but the flake tested positive for the Cervid family (deer, moose, elk or caribou). Deer is considered to be the least likely of the four and caribou the most likely. The heavy wear on the flake clearly indicates that the parent tool was used vigorously, most likely for butchering or hide processing. Since the flake was struck at the Jefferson IV site, presumably for reshaping the tool, it is reasonable to assume that hide or meat processing was taking place at the site.

Given the positioning of the campsites on vantage points over the valley floor and the relative abundance of points broken on the hunt, in context with the Cervid protein, I argue that the Israel River Complex sites were occupied, at least in part, for the purpose of hunting game, probably caribou, within the valley.

We must be careful not to construe caribou as the only food source motivating settlement here. The former lakebed should have been a veritable supermarket, providing many aquatic plants. Inclusion of waterfowl, fish, and aquatic mammals such as beaver would have broadened the menu. Plant resources would also have been available and quite probably important.
We recovered a charred water lily seed from a small pit feature at Jefferson III. This plant has both nutritional and medicinal uses and grows in small ponds and lakes. Significantly, the site where the seed was recovered is located 40 meters above the former glacial lakebed and at least 200 meters from any locality that might have supported a pond. The presence of the seed indicates intentional collection of the plant for use at the site.

**The Second Major Function of the Sites Was Tool Manufacture.** The Israel River Complex is unusual among the Paleoindian sites of the Northeast in that the dominant raw material on site is not an exotic rock type but a local material. This is extremely rare on Paleoindian sites in the Northeast. The explanation is that the Complex is located on a glacial till containing blocks of good quality tool stone, a spherulitic rhyolite. This rock owes its origin to magma that was forced through narrow fissures in the bedrock, where it quickly cooled into an exceptionally hard, brittle stone with characteristics very close to that of flint or chert.

This material was used extensively at the Complex for the manufacture of fluted points. We have recovered fluted points broken at all stages of manufacture, and they outnumber finished points by at least four to one. Rhyolite also was used for the manufacture of the full range of Paleoindian tools including cutters, scrapers, engravers, and splitting wedges used on bone or antler. Also, rhyolite chipping debris accounts for 90 to 99 percent of the materials recovered at any given encampment in the Complex.

The next most popular variety of stone used was from Munsungan Lake in northern Maine. The total number of waste flakes from the four sites is estimated to be in the hundreds of thousands. The Paleoindian peoples made extensive use of the available stone resources, and it is likely that the lithic resources were a significant factor in bringing them to the Israel River Valley.

Let's now consider the Israel River Complex within the broader regional and temporal context. The stone tools used by the Paleoindians provide us with a key mechanism to estimate their movements. The Early Paleoindian period sees the appearance of people carrying, breaking, and making Gainey or Bull Brook style points in Jefferson. Interestingly, in Jefferson all of these identifiable specimens were made from the local rhyolite, while...
the Barnes or Neponset points were made from the local rhyolite as well as Munsungun chert and other unidentified cherts.

The presence and movement of these people throughout New England is demonstrated not just in terms of the stylistic similarity of their fluted points but in the actual raw material from which the points were made. Recent research by Hermes and Pollock (2001) has shown that spherulitic rhyolite from the Mount Jasper source (30 kilometers east of Jefferson) is present at the Spiller Farm Site in Wells, Maine, in the southwestern part of that state and at the Neponset Site in southeastern Massachusetts. Pollock et al. (2000) also have argued persuasively that Munsungun Lake cherts are found in these same sites and at many other Paleoindian sites throughout the Northeast.

The Israel River Complex sites were certainly on the itinerary of the Paleo peoples. Munsungun chert points account for half of the finished points, and there are small but consistent percentages of resharpening flakes at all of the occupied areas.

MOVEMENT THROUGHOUT NEW England, including movement through the Israel River Complex, continued through to the end of the Younger Dryas. The question thus arises: Why were Paleoindian people moving so broadly throughout the region?

It is unlikely that the high quality stone for making tools was sufficient in and of itself to provoke such travel. Instead, Caribou appear to have been a major target of the Paleoindian hunters. Traveling in huge numbers when they made their seasonal migrations, caribou had tremendous potential for both meat and hides. The spear points were certainly more than adequate to the task, having been used elsewhere to hunt much larger game such as mammoth and bison.

The site locations in the Israel River Complex were ideally suited to provide a panoramic view of the valley. The environment on a broad scale in the northeast was composed of a spruce parkland that provided an ideal habitat for caribou (Newby, 2001). A recent reconstruction of the best habitats for caribou, especially their spring calving areas, has identified an important pattern (Spiess, 2001). At the beginning of the Younger Dryas and the Paleoindian period we see that the lower Great Lakes provided an important caribou habitat. As the Younger Dryas proceeded, the habitat shifted to the east and north, establishing a major caribou range in northern Maine and adjacent New Brunswick and a smaller range in northern Vermont and edging over into New Hampshire. Later, the habitats shifted even more, with the lesser area dissipating and the larger area edging farther north.

Contemporary with these large caribou herds, which relied on open ground or tundra-like settings, were also smaller
herds of woodland-adapted caribou. These smaller herds would have ranged through northern New Hampshire. The Israel River Complex could have been located on the movement paths of wintering bands of caribou from the large, long-distance herd, or the Paleoindians could have had access to locally migratory herds in the White Mountains, or both. Thus the location of the Complex would have been especially attractive to caribou hunters.

**Summary**

The assembled evidence from the Israel River Complex indicates a long-term occupation. The same sites inhabited in the Early Paleoindian were still used in the Middle Paleoindian. While some areas of artifact concentration seem to contain only one or the other of the principal point styles, these areas are still in very close proximity (i.e. within tens of meters) to one another, and others contain both varieties. It appears certain that there were repeated occupations over a long time span within this small area. Furthermore, these occupations coincide almost exactly with the Younger Dryas climactic event. This association may prove to be one of the more significant aspects of the Complex. This continuity of occupation over time (at least 500 years and possibly as long as a millennium) ends abruptly with the termination of the Younger Dryas, when forests began to close in on the landscape.

The settlement and subsistence patterns of the Paleoindian people in the Israel River Valley point to a hunting and gathering culture that exploited caribou for both meat and hides. Whether they were specialized caribou hunters or more generalized hunter-and-gatherers remains to be determined. It is clear, however, that once the environment favorable to caribou disappeared in northern New England, the Paleoindian culture vanished as well.

As we develop broader and more detailed understanding of this dynamic environment, we will acquire a better understanding of this early culture and develop better, more detailed, questions for future research.

"These mountains are not especially high, but they are still steep, rugged, and subject to severe weather. The dangers likely would have been more extreme in the waning years of the Ice Age."

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References


