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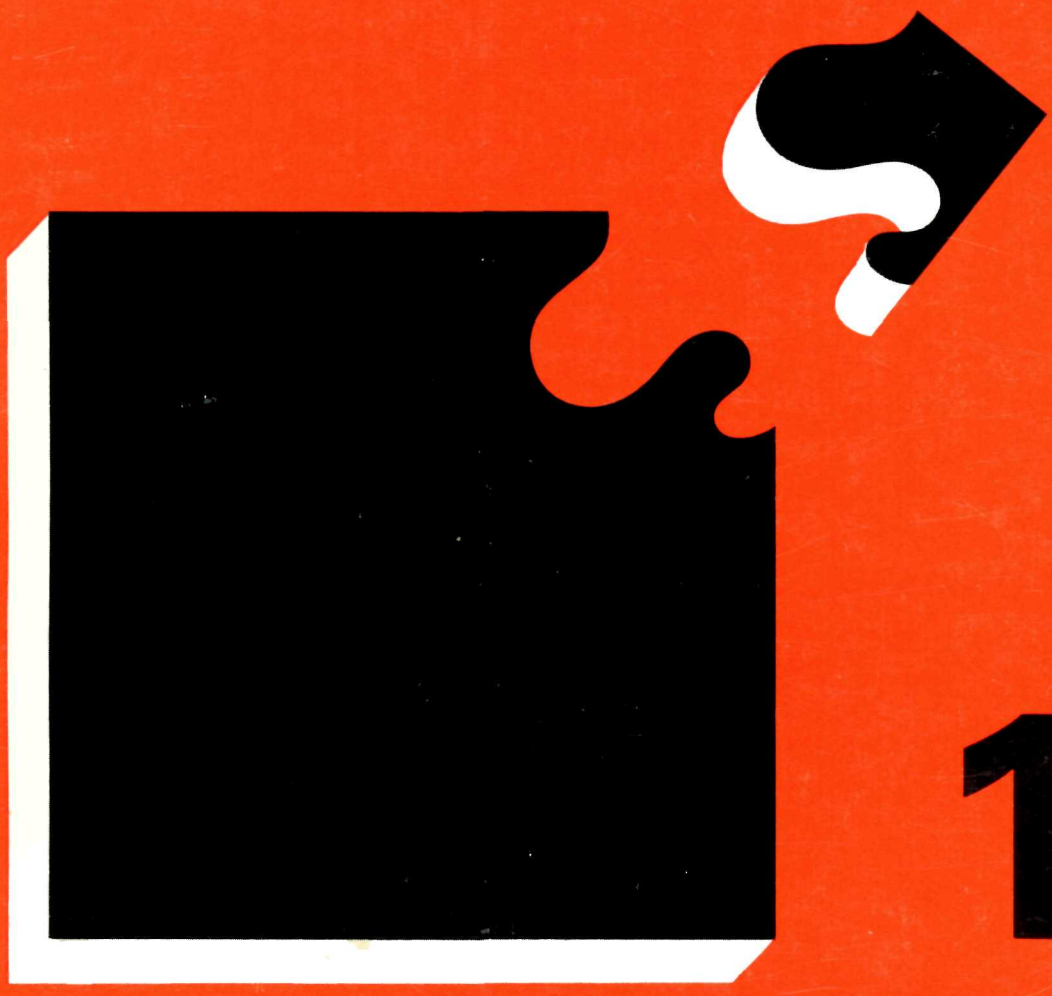

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PREHISTORIC OCCUPATIONS AT COTEAU-DU-LAC, QUEBEC: A MIXED ASSEMBLAGE OF ARCHAIC AND WOODLAND ARTIFACTS

RICHARD LUEGER

ANALYSES OF TWO PREHISTORIC COPPER ARTIFACTS FROM THE CLOVERLEAF BASTION OF THE FORT AT COTEAU-DU-LAC, QUEBEC

A. COUTURE AND J.O. EDWARDS

IDENTIFICATION OF REPRESENTATIVE PREHISTORIC STONE ARTIFACTS AND SAMPLES OF UNWORKED STONE FROM THE CLOVERLEAF BASTION OF THE FORT AT COTEAU-DU-LAC, QUEBEC

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THE HUMAN OSTEOLOGICAL MATERIAL FROM THE CLOVERLEAF BASTION OF THE FORT AT COTEAU-DU-LAC, QUEBEC

J. EDSON WAY

NATIONAL HISTORIC PARKS AND SITES BRANCH

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Prehistoric Occupations at Coteau-du-Lac, Quebec:
A Mixed Assemblage of Archaic and Woodland Artifacts
by Richard Lueger

Abstract

Despite severe disturbance caused by the construction of a British fort in the 19th-century, the area covered by the cloverleaf bastion and perhaps other areas of the fort at Coteau-du-Lac can be shown to have been occupied or used periodically for some 5,000 years. The presence of certain diagnostic artifacts permits the identification of at least four prehistoric occupations of the site: the Brewerton and probably the Vergennes phases of the Laurentian tradition, another later Archaic manifestation represented by Lamoka points; a Middle Woodland occupation represented by Point Peninsula pottery and human remains, and a Late Woodland presence, poorly but surely in evidence due to five Iroquoian potsherds.

Submitted for publication 1975, by Richard Lueger, Quebec City.

Abrégé

En 1965, la Direction des parcs et des lieux historiques nationaux, Parcs Canada, le ministère des Affaires indiennes et du Nord, a entrepris des fouilles archéologiques à l'emplacement du fort anglais construit au XIX siècle à Coteau-du-Lac, aux confluents de la rivière Delisle et du fleuve Saint-Laurent. Au cours de l'été, les fouilles furent en grande partie exécutées sous la direction de M. William J. Folan, à ce moment archéologue en titre à la Direction et maintenant co-directeur de Coba Survey au Mexique. En 1966, l'adjoint de M. Folan, M. Roger Marois qui est archéologue du Québec à la Commission archéologique du Canada du Musée de l'Homme à Ottawa, a exécuté de nombreuses fouilles à cet emplacement. En 1968, l'auteur de ce document a aussi effectué des travaux à cet endroit.

En raison du remaniement des tissus préhistoriques causés par les travaux de construction du fort anglais et aussi en raison des connaissances restreintes de l'auteur en matière d'archéologie de l'est du Canada, ce document se limitera à décrire les artefacts retrouvés et à identifier les phases ou les affinités culturelles par l'étude des artefacts. A moins de retrouver plus tard, sous les travaux de terrassement, des couches non remuées, la valeur de ce document repose sur la récupération d'un échantillon assez grand d'un constituant de l'époque Laurentienne. Il serait profitable de faire une étude comparée de répartition avec d'autres artefacts.

Au moins 1 756 artefacts représentant l'utilisation et

l'occupation préhistorique de l'emplacement furent récupérés en grande partie à l'emplacement du bastion en forme de trèfle. Parmi ceux-ci, 1 421 ossements, bois ou dents, 123 pierres picotées ou façonnées adoucies, 85 pierres taillées ou en lames, 106 poteries et 21 pièces de cuivre. Seuls 203 artefacts ont été attribués avec certitude à des phases ou traditions connues. On a identifié au moins quatre phases ou traditions: la tradition Laurentienne, surtout la phase Brewerton et probablement la phase Vergennes représentée par au moins 87 artefacts. L'occupation primitive de la péninsule de la Pointe est indiquée par au moins 104 artefacts, en grande partie des tessons, et une présence iroquoise est représentée par 5 tessons. Plusiers artefacts auraient pu être identifiés à une phase ou à une autre, n'eût été la nature de l'emplacement et les similitudes de typologie fréquentes entre les différentes phases ou traditions. En tout cas, suffisamment de données ont été recueillies pour démontrer qu'une partie du fort de Coteau-du-Lac a été habitée ou a servi, de façon intermitente, pendant près de 5 000 ans, surtout comme poste de chasse et de pêche, mais également comme cimetière et probablement comme piste de portage et emplacement de camp de repos.

Acknowledgements

The contributions of two men deserve special mention. Dr. Robert Funk, Senior Scientist, Archeology, of the New York State Museum and Science Service, Albany, and Clyde Kennedy, then president of the Ottawa Archaeological Society, were both kind enough to inspect the prehistoric artifacts from Coteau-du-Lac and offer their opinions. Many of the identifications in this report are based on their advice, though of course any errors are the responsibility of the writer. Dr. James Fitting, then State Archaeologist for the Michigan Department of State, Lansing, was also good enough to reply to an inquiry concerning an Old Copper point. Dr. William J. Folan, then staff archaeologist with National Historic Parks and Sites Branch and now Co-director, Coba Archaeological Mapping Survey, Mexico, was director of the Coteau-du-Lac project; he directed the writer in the early stages of this study and provided needed encouragement.

Analyses of materials and faunal remains from the cloverleaf bastion were carried out for the National Historic Parks and Sites Branch by various experts in government departments or by private individuals under contract to the department. Minerological identification of selected lithic samples was provided by D.E. Lawrence and Mariette Turay of the Geological Survey of Canada, Department of Energy, Mines and Resources. Analysis of two copper artifacts was provided by A. Couture (1969) of the Non-Ferrous Metals Section, Physical Metallurgy Division, Mines Branch, Department of Energy, Mines and Resources,

Ottawa. J. Edson Way, now of the Department of Anthropology, Beloit College, Beloit, Wisconsin, studied the human remains recovered (Way 1970). Dr. Howard Savage, of the Royal Ontario Museum, identified, where possible, the bone and antler used for artifacts (Savage 1970a, 1970b), the teeth used for artifacts (Savage 1970c) and the avian faunal remains (Savage 1970d). James A. Burns, then of the Department of Anthropology, University of Toronto, provided identification of a sample of the mammalian faunal remains (Burns 1970) and W.B. Scott, of the Royal Ontario Museum, analyzed the fish remains (Scott 1970). Specific identifications of materials in the text are based on information provided in their reports.

Introduction

In 1965 the National Historic Parks and Sites Branch of the Department of Indian and Northern Affairs began archaeological investigations at the 19th-century British fort at Coteau-du-Lac (Fig. 1) at the confluence of the Delisle and St. Lawrence rivers. Most of the excavations were completed that summer under the direction of William J. Folan, then staff archaeologist with the Branch; these excavations included two narrow trenches in the cloverleaf bastion undertaken to discover whether or not remains of gun platforms and a flagpole base could be located. It was at this time that excavators recovered a small number of prehistoric artifacts. In 1966 Folan's field assistant, Roger Marois, now Quebec Archaeologist, Archaeological Survey of Canada, National Museum of Man, Ottawa, returned to the site to complete several excavation units. The activities of Marois and his crew that summer (Marois 1966) included the excavation of large sections of the cloverleaf bastion in new efforts to locate the flagpole base, but primarily to recover the hoped-for prehistoric deposits. Marois's excavations (Fig. 2) soon revealed that most of those deposits were severely disturbed. Except for two burials (Figs. 4-6), therefore, most of the cloverleaf bastion excavations were conducted with shovel and screen. When the writer began work as a research assistant to Folan in 1968 he was assigned the task of cataloguing prehistoric artifacts already recovered and, if possible, identifying the prehistoric occupations at the site. When

the material was examined it became evident that, with the exception of one burial, the entirety of the prehistoric assemblage recovered had been disturbed by the British occupation and mixed with European garbage. Thus later excavations in the cloverleaf bastion were treated as salvage operations.

As part of the restoration programme of the fort, cannons were to be installed in the cloverleaf bastion and in late April 1968 the writer began attempts to locate remains of the gun platforms. This undertaking lasted three weeks, during which time the small crew managed to unearth traces of the platforms and to recover significant quantities of prehistoric artifacts. As in 1966, most of the excavations were carried out with shovel and screen. No intact burials were found, but human bones were strewn haphazardly around and beneath the gun platform remains. Only one small area is believed to have remained undisturbed, the northeast corner of the eastern lobe of the bastion (9G57D4).

This paper is a summary of the prehistoric assemblage at Coteau-du-Lac. Because the site was so badly mixed and because the writer's experience in eastern Canadian prehistoric archaeology is limited, the scope of the paper is confined to a description of the artifacts found and an identification of the phases or cultural affinities represented by certain diagnostic artifacts. The value of this paper and of the site itself, unless undisturbed deposits can later be found beneath the earthworks, lies chiefly in the recovery of a sizeable Laurentian lithic component. Other artifacts may prove useful in comparative distribution studies.

The Site

The fort at Coteau-du-Lac is located on the north shore of the St. Lawrence River some 30 miles upstream from Montreal. The cloverleaf bastion occupies a steep-sided promontory of land extending into the river and is the furthest projection of the fort into the river (Figs. 1, 2). The surface area of the bastion is approximately 100 ft. wide at its broadest by 100 ft. long, roughly the original size of the promontory. The floor of the bastion lies some 17 ft. above the mean level of the St. Lawrence at that point. The bastion is enclosed by earthworks on all sides with a narrow entrance 6 ft. wide to the west. When the writer arrived in 1968 the earthworks averaged about 4 ft. above the level of the interior floor of the bastion though this was after a century and a half of erosion plus archaeological investigations in 1966 and some rebuilding and re-sodding by the department.

History

The cloverleaf bastion was erected during the main construction period of the fort in 1813-14, but previous use and possible subsequent 19th-century restoration of the site do not permit the fixing of a single date for the disturbance of the prehistoric deposits. The rapids in the St. Lawrence, the reason for a canal at Coteau-du-Lac and hence the fort, had necessitated portages across the area of the fort in the Indian and French periods. But it was only in 1749 that a protected passage around the rapids was provided, in the form of a narrow channel flanked by a pile of rocks around the eventual site of the cloverleaf bastion. A canal was built across the site of the fort in 1779-81 and by the time the fort itself was constructed during the War of 1812, a number of buildings been erected up around the canal. During this period the site of the bastion must have

seen at least casual use as, perhaps, a lookout site or a garbage dump. When the cloverleaf bastion was built in 1813-14, the earthworks were made of soil scooped from the centre and piled around the periphery. Undoubtedly, considerable quantities of soil for the ramparts were brought from elsewhere. Cannons on wooden platforms were mounted in each lobe of the bastion. The fort fell into disrepair soon after the War of 1812, however, and when the fort was re-garrisoned during the Rebellion of 1837 it became necessary to reconstruct most of the gun platforms, possibly including those of the cloverleaf bastion. After 1837 this area of the fort saw little use. For a more detailed history of the fort, see Folan and Ingram 1973.

Excavations

Because of the disturbed condition of the prehistoric remains at the site, there is little point in discussing the stratigraphy or dispersal of the artifacts. We cannot even assume that they all were deposited in the cloverleaf bastion before the arrival of the British as fill was probably carried from other parts of the fort to erect the earthworks (Folan: pers. com.). Only burials 9G49A and 9G49B and lot 9G57D4 (Fig. 3), which was perhaps undisturbed and where an Otter Creek point (Fig. 14n) was found, deserve to be mentioned. The rest of the artifacts have been organized into one section as if they had been a single component even though in some cases artifacts have been identified as to phase or era by comparison with established typologies from other sites. These identifications are supplied in the conclusions, where general inferences as to the prehistoric occupations of the site are also made.

The first archaeological investigation in the cloverleaf bastion was 9G10A1, two narrow trenches excavated in 1965. Operations carried out in 1966 in the cloverleaf bastion included 9G44, 45, 47, 48, 49 and 50. Suboperations consisted of square or rectangular pits 5 ft. by 5 ft., 5 ft. by 10 ft., or 10 ft. by 10 ft. Lots consisted of arbitrary levels 0.5 ft. deep or 0.3 ft. deep when concentrations of artifacts were found (Marois 1966a: 1). With the exception of two burials, 9G49A and 9G49B, all of these operations have been shown by their artifact content to have been mixed with European deposits. And, with the

exception of lot 9G57D4, the same is true of the 1968 excavations: 9G57A (the northern lobe of the bastion), 9G57B (the southern lobe) and 9G57C, D and E (the eastern lobe). The 1968 suboperations were excavated as single lots to the level of the gun platforms. The next lots (9G57A2, 9G57B2, 9G57D1 and 9G57E1) were limited horizontally by a line 0.5 ft. within the supposed outline of each gun platform and downward to sterile subsoil in 0.17-ft., 0.33-ft. and 0.5-ft. arbitrary levels. This was done under instructions to salvage any material in the area to be occupied by the concrete foundations of the reconstructions of the gun platforms. Only in the eastern end of the eastern lobe were any significant remains found beneath the disturbed layer of the gun platform. The supposed area of the gun platform was arbitrarily divided into two halves, 9G57D and 57E (see Fig. 2). The stratum found was a mixture of sand and pockets of reddish-brown and dark soil with European and indigenous artifacts scattered throughout. The layer sloped towards the river. With the exception of one shallow patch of clay stained red in the western corner of 9G57E1, the western halves of 9G57D1 and 57E1 revealed nothing but hard, sterile yellow clay. The red stain was the last trace of what had been interpreted in 9G57C1 as the bottom of a disturbed burial. 9G57D1 and 57E1 were evened off at 6-in. levels and the eastern halves were excavated another 6 in. as 9G57D2 and 57E2. The mixed stratum quickly disappeared in 57E2 but continued in the northeastern part of 57D2. 9G57D3 was begun as an arbitrary level directly beneath 57D2 but after 2 in. the mixed sand and soil disappeared, leaving sterile clay and, in the very northeastern corner, a deposit of dark brown sandy soil. This was excavated as 9G57D4. It sloped northeastwards to a depth of 8 in. below 9G57D3 at the edge of the excavation

and presumably continued on beyond the limits of excavation. Beneath it was sterile clay.

Faunal Remains

Given the disturbance of the site, we cannot expect much useful information from the faunal remains. There were, for example, a few cow, pig and chicken bones mixed in with the sample. In the interests of gleaning as much information as possible from the site, however, National Historic Parks and Sites Branch commissioned a number of studies to identify the species present. Dr. Howard Savage, of the Royal Ontario Museum, and James Burns, then of the University of Toronto, summarized the bone count as follows (approximate count is indicated by an asterisk):

	Number of Bones	Percentage of Total
Mammal	24,884*	63.4
Avian	340*	0.9
Reptile (turtle)	2,288	5.8
Fish	11,707	29.8
Amphibian	13	0.1
Total	39,232*	

The shells that were recovered, mainly of small snails, were not studied and only a sample of mammal bones was examined (Burns 1970). In 9G47D (Fig. 2), Burns identified a minimum of six muskrat, three beaver, one otter, two each of deer, bear and a canine species, and one each of raccoon and woodchuck. In his examination of the bone and antler artifacts, Savage also identified black bear, moose and a possibility of white-tailed deer, American elk or caribou (Savage 1970a, 1970b). Savage also identified 27 species of birds among the avian remains (Savage 1970c), with passenger pigeon bones comprising the single largest group identified for one species. This was followed by geese, ducks, swans and other waterfowl, the spruce grouse and various other

species. Interestingly enough, bones of a trumpeter swan, now restricted to northwestern North American, were found in what was apparently a definite prehistoric context. Some turtle and a few amphibian bones were not, with the exception of a snapping turtle bone, identified as to species. Scott's examination of the fish bones (Scott 1970) revealed remains of 18 of the possible 26 food fish normally available in the area. The most common species represented were the channel catfish followed by the redhorse sucker, smallmouth bass, freshwater drum and rock bass.

Burials

Way (1970: 7) has concluded that at least 14 or, more likely, at least 20 individuals are represented by the human remains found at the site. Marois excavated two burials in 1966 (9G49A and 9G49B) and discovered a third. In 1975 he received permission to complete excavation of the third and it is to be hoped that this operation will clarify the problem of the provenance of the burials.

No intact burial was found in 1968 though a jumbled array of human bones (9G57B4) was recovered directly beneath the wood of the gun platform in the centre of the bastion's southern lobe (9G57B). It is believed that this was a burial found during the construction of the bastion in 1813-14, forced into a shallow depression and covered by the gun platform. In addition, a roughly rectangular patch of red-stained soil about 1.7 ft. by 2.6 ft. by 0.8 ft. deep was found in the western area of 9G57C, 9G57E1. A small number of decomposing bone scraps, probably human, and two worked beaver incisors were found within the fill. This may represent the bottom part of another burial, the upper part of which was cut away and dispersed during the construction of the bastion. Numerous pieces of yellow and red ochre

were found throughout the deposits in the bastion (including burial 9G49B). Many of the disjointed human bones were found scattered beneath the remains of the gun platform at the eastern end of the eastern lobe (9G57C, D, and E).

Burial 9G49A

Burial 9G49A (Fig. 4) consisted of an extended, adult female with an infant about 18 months old (Way 1970: 5). The adult was oriented east to west with the feet to the east. Marois was evidently unaware of the presence of the infant, but as he remarks that the chest of the adult was a mixture of bones, we may infer that the infant had been placed on the woman's chest. Marois described the burial as follows:

> 9G49A1 qui se trouvait à 5.95' de la ligne d'élévation (154.54') est en partie sous 9G45A et 9G45M. Quelques artefacts étaient associés à ce squelette mais la majorité était constituée d'éclats. Le nombre restreint d'artefacts s'explique par le fait que ce squelette avait été découvert auparavant, probablement lors de la construction du bastion. Les côtes du côté droit avaient été coupées et déposées sur les côtes du côté gauche de telle sorte que la poitrine constituait un ensemble d'os enchevêtrés. Plusieurs os longs et des os des doigts et des pieds manquaient. Les quelques os trouvés à peu près au même niveau dans le coin de la tranchée de 9G45M pourraient appartenir à ce squelette qui était en position étendue, les pieds vers l'est. Très près des os du squelette quelques artefacts d'origine européenne (clous, poterie) ont été trouvés (Marois 1966a: 4).

This burial was found beneath the southern parapet of the eastern lobe of the bastion at a height of 148.59 ft. above sea level, or about 1.5 ft. below the current level of the bastion floor. The only significant grave goods found were two bear canines, ground almost flat across the root (Fig. 25c, d), and possibly two artifacts of turtle bone, which were rounded somewhat and smoothed. One was a plastran portion measuring 23.2 mm. by 21.4 mm. by a maximum of 17.4 mm. thick. The other was a carapace portion 25 mm. by 17.6 mm. by a maximum of 5.9 mm. thick. Perhaps they were gaming pieces.

Burial 9G49B

Burial 9G49B (Figs. 5, 6) also was found beneath the southern wall of the eastern lobe of the bastion, but was slightly lower than 9G49A at 148.29 ft. above sea level. It was a flexed burial of a robust adult male about 41 years old (Way 1970: 6). Marois described this burial thus:

> Le squelette trouvé en 9G49B1 à 6.25' au-dessous de la ligne d'élévation (154.541') était à un niveau légèrement inférieur mais dans le prolongement de 9G49A1. En fait les deux squelettes étaient tete à tête. 9G49B1 avait la tête vers l'est et les pieds vers l'ouest, regardant le sud-est en direction de la rivière et était couché sur le côté gauche en position semi-fléchie. Le niveau constituait une intrusion dans le dépôt alluvial contrairement à 9G49A1. Aucun artefact européen n'a été trouvé et tous les os étaient parfaitement en place. Parmi les artefacts associés au squelette, plusieurs os, mal conservés, demanderont une reconstitution. Quelques-uns ont été facilement identiables: un

> gros hameçon en os près de l'ilion droit, une bannière en pierre polie entre les côtes et le bras gauche ainsi qu'un caillou sculpté (près de la main gauche). A part ces artefacts, on peut mentionner un grand nombre d'éclats qui demanderont un examen systématique pour découvrir leur importance ainsi qu'une bonne quantité de petits os....On a remarqué plusieurs traces d'ocre et quelques traces de cendre sans charbons de bois suffisants pour le radiocarbone (Marois 1966a: 4-5).

Burial goods associated with the skeleton consisted of a large bone dagger (Fig. 7a) laid across his left wrist (Fig. 6); four antler tines that may have been flakers (Fig. 7b, c, e, f); an antler tine fragment partially drilled through one face (Fig. 7d); an antler hook-like object (Fig. 7g), 88 mm. by 18 mm. by 12 mm., with an incised loop at one end though the loop was broken subsequent to excavation; a large antler object of unknown purpose ground flat on one edge (Fig. 7h), and a winged bannerstone of polished sandstone (Fig. 7i). The bannerstone measured 133 mm. wide by 48 mm. high and the wings averaged 5 mm. thick; the hole diameter was 13 mm. Since the burial has tentatively been judged to be of Middle Woodland provenance (Way 1970), the bannerstone would be anachronistic. The dagger is, however, generally considered to be a Middle Woodland trait in the St. Lawrence valley and the bannerstone may simply have been an object found and cherished by the deceased or it could have been found and included during the excavation of the grave in prehistoric times. The ground was probably saturated with Archaic material. On the other hand, it should be pointed out that Way's comparative data consisted of Middle and Late Woodland samples; he did not have an

Archaic population available. In any case, the rest of the artifacts are not diagnostic. The "sculptured stone" was a curious pebble with an incised smiling human face and ears (Fig. 8), measuring 72 mm. by 37 mm. by 22 mm. Other artifacts found within the burial fill but not necessarily included as grave offerings were two beaver incisor tools and 14 fragments of worked bone.

Artifacts

Lithic Artifacts

All the lithic materials employed could have originated naturally in the Coteau area (Lawrence: pers. com.).

Pecked and Ground Stone

Excepting the adzes and celts, the pecked and ground stone industry can be considered as an essentially Archaic trait. Minerals employed were varied, but two materials in particular were used: a fine red shale or slate, depending on the minerologist's terminology, used for knives and stemmed points, and a tough blue-black slate, pecked and ground into celts or other heavy cutting tools.

Adzes and Celts

Four plano-convex adzes (Fig. 9d, e, f, m) and one small flat adze (Fig. 9h) were recovered, plus a small adze or chisel broken proximally (Fig. 9g). The heaviest of them (Fig. 9m) is made of sandstone and the others are of green amphibole schist. One of the adzes (Fig. 9f) has a bit at either end, one of them oblique and almost straight, the other rounded. Another adze (Fig. 9f) was evidently chipped though the edge was coarsely ground; it is made of slate.

The four tools classed as celts (Fig. 9a, b, c, l) are all biconvex in cross-section. One (Fig. 9a) is of black

argillaceous sandstone, another is of coarse sandstone (Fig. 9l), and the other two (Fig. 9b, c) are of green amphibole schist. Two other celt-like tools (Fig. 9i, j) are made of sandstone; comparatively thin, flat and soft, they would have made poor woodworking tools and may have been for scraping or sawing. One (Fig. 9i) is complete. (See Table 1 for dimensions of all illustrated examples.)

The division into adzes and celts is based on the symmetry of the bevel and may not represent any real functional difference. Sanger (1973: 28) points out that according to examples in the ethnographic collection in the National Museum of Man, bit-bevel symmetry does not necessarily reflect use as axe or adze.

Six other possible fragments or preforms of adzes or celts were found. One is a small flat celt or adze of coarse shale, 66.8 mm. long (though broken proximally) by 37.5 mm. wide by 6.2 mm. thick (though both faces have foliated off). Another fragment is probably a celt; it is a bit fragment of pecked and ground blue-black slate. Two other body fragments or preforms are made of the same slate, another fragment is made of schist and the sixth fragment is of black basalt.

Gouges

One gouge bit fragment, one probable gouge preform fragment and one poll fragment of a finished or preform gouge were found, all made of pecked black or blue-black slate. The tapering poll fragment (Fig. 9p) would likely have had a long narrow channel; the one bit fragment (Fig. 9r) was pecked and ground into a short deep channel and the inferred preform (Fig. 9q) had been pecked into shape on its sides and ground flat and smooth on one face and on part of the other. (See Table 1 for dimensions.)

Chopper

One coarse piece of grey-pink sandstone (Fig. 9n) has smooth worn lateral grooves. The blade may have been roughly chipped into shape though the edge is not especially sharp. It is possibly a hafted chopper or club, but may be merely an abrasive stone. (See Table 1 for chopper dimensions.)

Scraping Tool

One rectangular piece of pecked slate is broken at one edge (Fig. 9o; see Table 1 for dimensions). It is roughly crescent-shaped in cross-section, with one edge rounded and the other moderately sharp and apparently worn. Though no grinding is evident, the ventral surface along the sharper edge is also worn. Although this may be a fragment or preform fragment of a celt or broad gouge, it appears to have been used as a scraper.

Plummets

One complete plummet and five head fragments were found, all of pecked and ground sandstone (Fig. 10a-e). Only one fragment is not illustrated. The one complete example (Fig. 10a) measures 77.1 mm. long by 36.1 mm. wide by 27.2 mm. thick and weighs 96.1 g.; one face is flat.

Ground Stone Knives

Fragments of at least 14 ground stone knives were found. Five are complete enough to be identified as semilunar knives or ulus. Three of the ulus are flat polished blades of grey slate and are shown (Fig. 10f, g, h) with the blunt heel at the top and with what curved cutting edge remains to the lower right; maximum blade thicknesses are 5.2 mm. (at

the heel), 3.9 mm. (at the heel) and 6.5 mm. (at mid-blade) respectively. Two ridged or thick-heeled ulus (Fig. 10i, l) were identified, made of grey shale 19.2 mm. thick at the heel and of red slate 12.1 mm. thick at the heel respectively.

This ridged variety has been found on Allumette Island, a Vergennes-related site in the Ottawa River, by Clyde Kennedy (pers. com.), who calls them "ridge-back" ulus. Fowler (1963: 6) calls them "comb-backs" and considers them an early Archaic trait. Such knives are not common but have been found in New York, New England (De Laguna 1946: 126) and occasionally in Ontario (Wright 1962: 137).

Fragments of at least nine, perhaps 11 or more, other flat ground stone knives were found. Since several fragments are of the same red slate (for example, Fig. 10n, o, p), it is difficult to know how many original objects are represented. One red slate knife (Fig. 10m) is unusual in that the one intact end is truncated and ground flat. Its width is 28.4 mm. In cross-section the blade is a flattened pentagon, but virtually lenticular since the faces are so smooth. The edges, or what remains of them, are quite narrow though blunt. It is unlikely that the parts of the blade's edges still intact were for cutting. Another smaller and less complete knife, this one of grey slate, has a similar truncated end and may be of the same type.

Seven other fragments of flat gray or black slate knives were found, including those illustrated in Figure 10j and k, plus a small blade of black slate squared and sharpened at one end. The latter is 41 mm. long, though broken proximally, by a maximum of 19 mm. wide and 3.6 mm. thick, and expands slightly towards the cutting end. (See Table 2 for dimensions of the illustrated examples.)

Ground Stone Points

Fifteen ground slate and shale points (including Fig. 11a-m) and what are believed to be 21 preforms in various stages of production (including Fig. 11n-r) were identified. The incomplete stemmed points (Fig. 11a-h) would have ranged from about 40 mm. to 100 mm. long when complete. Widths range from 28 mm. (Fig. 11h) to 39.8 mm. (Fig. 11a) and thicknesses from 4.2 mm. (Fig. 11e) to 7.5 mm. (Fig. 11b). The two black slate points (Fig. 11b, f) are the thickest and sturdiest of the points. Four of the points (Fig. 11b, f, i, l) are flat diamond-shaped in cross-section; the smallest example (Fig. 11m) is flat with blunt edges and the rest are flat hexagons.

The preforms are evidence that points were being manufactured on the site. They range from an estimated 56 mm. to 84 mm. long when complete; the widths measure from 14.1 mm. to 22.8 mm. and the thicknesses from 2.3 mm. to 8.3 mm.

Seven of the points are made of red slate (Fig. 11a, e, i-m), one is of coarse grey-brown shale (Fig. 11c), five are of various grey slates (including Fig. 11d, g, and h) and two are of black slate (Fig. 11b, f). The preforms include 14 of red shale (including Fig. 11n-q), five of grey slates, one of black slate (Fig. 11r) and one of fine sandstone. (See Table 3 for dimensions of the illustrated examples.)

Pointed Slate Objects

Seven pointed objects of ground slate form a dubious class (Fig. 12a-g). Most are fractured and most have surfaces so weathered and pitted as to obliterate any signs of working. The largest example (Fig. 12a) is triangular in cross-section; it is ground and polished at the point and on two of the faces, while the reverse face is fractured. Two

more slender examples (Fig. 12b, c) are rectangular in cross-section. Their surfaces are badly weathered and show little evidence of grinding; these and two flat examples (Fig. 12d, e) may simply be pointed flakes though the latter is definitely worked on one face and edge. The two smallest specimens (Fig. 12f, g) are also too weathered to exhibit any working, but the latter is too symmetrical to be natural. It is roughly pyramidal in form; the base is somewhat aslant, however, and the cross-section is kite-shaped. (See Table 4 for dimensions.)

Pointed Sandstone Objects

Four large pointed objects of sandstone form another dubious class since they are of differing shapes and their functions are unknown (see Table 4 for dimensions). The smallest fragment (Fig. 12h) is a flat hexagon in cross-section, both faces being centrally ridged and the edges flat. A heavier tip fragment (Fig. 12i) is also a flat hexagon in cross-section while a third, flatter example (Fig. 12j) is a flat pentagon, one face being flat. The large specimen (Fig. 12k) is almost complete; the point is missing, probably shattered during excavation. This object too is a flat hexagon in cross-section, but the faces are flat and the edges bevelled. The edge of the broad end and both faces within 62 mm. of the broad end are rough and battered. Otherwise the surface is smooth and the edges rounded and dull. The shaft constricts bilaterally at 65 mm. from the narrow end, giving two slight smooth notches on the edges.

Ground Slate Rods

Seven ground slate rod fragments were recovered and five are illustrated (Fig. 12n-r). They range from 8.5 mm. wide by

7.4 mm. thick (Fig. 12o) to 25 mm. wide by 13.2 mm. thick (Fig. 12h). Most are rounded quadrilaterals in cross-section.

Abrasive Stones

Some 23 objects, most of them flat pieces of fine sandstone, show signs of use as abraders. One heavy slab (Fig. 13a) had shallow round pits ground opposite each other into either face; it is not clear if the rock was to be perforated, if the holes had been used in the grinding or pulverizing of some mineral or seed, or if they were the result of the shaping of artifacts. One flat piece of slate is perforated. Broad depressions and shallow grooves show that it had been used as an abrasive stone (Fig. 13c); the hole was incised and gouged from both sides.

Another slate piece (Fig. 13d) has a long narrow groove worn on one face. The other objects illustrated (Fig. 13e-k) are all of fine sandstone. One example (Fig. 13e) has a wide shallow groove on one face, its edges rubbed smooth, and a shallow pit worn into the reverse face. The traverse cuts evident in the illustration are fresh, probably inflicted during excavation. The other fragments include specimens rubbed smooth over most of the surface (Fig. 13f, i), some with grooves (Fig. 13g, j), some with edges worn smooth and concave (Fig. 13h, j), and one with a shallow depression worn into one face (Fig. 13k).

Miscellaneous Ground Stone

A fragment of an unidentified barbed object of thin ground shale (Fig. 12m) and a possible flat bead fragment of ground slate (Fig. 12l) were found. Another fragment, of red slate, has a channel or hole about 12 mm. in diameter bored

obliquely into one surface. A possible pendant (Fig. 13b) of flat fine grey sandstone is worn smooth on one face and the edges, one face having largely flaked off. The hole was bored from both sides.

Chipped and Flaked Stone

Otter Creek Points

Two Otter Creek points (Ritchie 1961: 40) were found. One was chipped from flint (Fig. 14n); a base fragment, it measures 24.5 mm. across the shoulders, 19.1 mm. across the notches and 29 mm. across the ears by a maximum of 7.9 mm. thick. It was basally ground. The other is of quartzite (Fig. 14o) and measures 25.7 mm. across the shoulders and 18.3 mm. across the notches; one ear is broken. Its maximum thickness is 9.9 mm. and it was not basally ground.

Brewerton Side-Notched Points

Nine Brewerton side-notched points (Ritchie 1961: 19) were identified (Fig. 14a-g, i, j). Two other points (Fig. 14h, k) are side-notched and probably were variants. Some of the nine other side-notched points or fragments included in the "untyped" category (for example, Fig. 14j) may be related. All of the Brewerton side-notched points are of flint save two (Fig. 14g, k) of quartzite. Of the ten complete examples (Fig. 14a-j), lengths range from 28.2 mm. to 57.5 mm., mean 44.1 mm.; widths from 17.5 mm. to 33.5 mm., mean 25.4 mm., and thicknesses from 6.5 mm. to 10.4 mm., mean 8 mm. Four points were basally ground (Fig. 14b, g, h, j). The basal fracture of a possible Brewerton side-notched point of smoky translucent quartzite (Fig. 14k) is straight

and flat though this may have been an intentional break.

Brewerton Eared-Notched Points

Two Brewerton eared-notched points (Ritchie 1961: 17) were identified though one (Fig. 14m) is crude and a tentative example. It measures 32.4 mm. long by 22.1 mm. by 6.3 mm. The definite example (Fig. 14l) measures 40.4 mm. long by 25.6 mm. wide at the shoulders by 7.9 mm. thick.

Lamoka Points

Ten narrow stemmed points (Fig. 15a-d, f-k) and one possible preform (Fig. 15e) are of the same type as that associated with the Lamoka phase in central New York State (Ritchie 1961: 29). All are of chipped flint. Length measurements range from 28.2 mm. to 39.2 mm., mean 34.5 mm.; widths from 13.2 mm. to 17.5 mm., mean 15.8 mm., and thicknesses from 4.6 mm. to 7.9 mm., mean 6.2 mm. Most of the points are curved or at least plano-convex in side view, implying that the points were based on curved flakes; however, the supposed preform (Fig. 15e) was carefully chipped to give this curve.

Untyped Points and Knives

Fragments and complete specimens of an estimated 37 other points, knives and preforms of points (Figs. 15l-n, 16) have not been associated with any recognized types. As previously mentioned, nine side-notched fragments and points (for example, Fig. 16j) may be related to Brewerton points though one rounded base fragment may have in fact been a drill base; all nine are of flint similar to that of the Brewerton points. Several of the other untyped points could

have been given type names, but under the circumstances the writer considers this would be unwise. Most of the untyped points are of flint (Figs. 15l, n, 16b, g, i-o, r, s) or other forms of chert (Fig. 16c, h), followed by argillite (Fig. 16d, p, t), quartzite (Figs. 15m, 16e, q), quartz (Fig. 16a) and phillite (Fig. 16f). Of the non-illustrated pieces, all are of flint save two of quartzite. One of the three preforms (Fig. 16s) is of flint and the other two of quartzite. (See Table 5 for dimensions of the illustrated specimens.)

Scrapers

There were ten chipped flint end (Fig. 17a, b) and side scrapers (including Fig. 17c-e, g-i). Except for one (Fig. 17e), all are modified flakes with the flake scar visible on the ventral surface. The cutting edges range from 15.1 mm. long (Fig. 17i) to 32.8 mm. long (Fig. 17c). The edges of two (Fig. 17c, h) are irregularly chipped and the two may have served as strike-a-lights; the latter (Fig. 17h) also shows some possible retouch on the underside. At least three other flint fragments may also have served as scrapers.

A large tool of chipped red jasper (Fig. 17k) was roughly retouched along one end and may be a butchering or chopping instrument. (For dimensions of this and the other illustrated scrapers, see Table 6.)

An elliptical biface of tough pinkish-grey sandstone was apparently roughly chipped; its edges are worn, perhaps through human use, and it might be a scraper. It measures 109.5 mm. long by 52.7 mm. wide by a maximum of 19.8 mm. thick.

Knives

Four of the five small knives are of flint and the fifth (Fig. 17m) is of quartzite. The largest knife (Fig. 17l) is bifacially retouched along three of its four edges while the fourth edge, shown upwards in the photograph, is marked by a long shallow flute. The quartzite blade (Fig. 17m) is sharp along the curved edges and flat along the straight proximal edge, which is possibly a break; the blade flares just at the flat end to give tiny lateral spurs. The smallest example (Fig. 17j) has been retouched along two sides, but one end is broken. A fourth blade (Fig. 17n) was roughly retouched along its two straight lateral edges, but appears to be broken along the truncated end. The unillustrated knife seems to be a rounded base fragment; it is 26.8 mm. wide by 5.3 mm. thick. (For dimensions of the illustrated knives, see Table 6.)

Graver

One small flint object (Fig. 17f; see Table 6 for dimensions) had been chipped to a point at one end and the point had been worn. The object is evidently complete; the proximal tip is flat and covered with a thin inclusion of limestone and the body had been chipped into four main longitudinal facets, somewhat like a microblade core. Two other similar flint artifacts were recovered, but they are fragmentary and lacked points.

Slate Bifaces

Two large chipped slate bifaces and a fragment of a possible third were recovered. The larger (Fig. 18a) measures 211.6 mm. long by 59.5 mm. wide and 13.2 mm. thick. The truncated end has a smooth flat oblique fracture; it may have been

intentional. The smaller blade (Fig. 18b) is complete. It measures 147.7 mm. long by 53.5 mm. wide by 10.4 mm. thick. All edges of both are sharp enough to be useful, but no evidence of wear or retouch was noted. The possible biface fragment is cruder; it measures 63.2 mm. wide by 12.5 mm. thick.

Bone, Antler and Tooth Artifacts

Over 1,300 artifacts of bone, antler and tooth have been identified. Unfortunately, when in 1967 National Historic Parks and Sites Branch staff attempted to streamline artifact cleaning with washing machines (Folan, Rick and Zacharchuk 1968), some unsorted faunal remains, probably containing artifacts, from Coteau-du-Lac were inadvertently among samples used in experiments, rendering them unsuitable for analysis.

A total of 723 bone and antler artifacts recovered, weighing some 1,200 g., has been omitted from the discussions. They are principally wastage, splinters and shaft fragments of artifacts and it is virtually impossible to infer original forms or the number of original objects represented. Some 212 of these 723 fragments consist, however, of shaft tips, at least 75 of which had evidently been points. Most of these points are likely the remains of awls, but barbs, pins, and projectile points may also be represented.

Awls

About 72 artifacts were classed as awls, but this is a conservative estimate. Almost all are splinter awls and only five retain part of a joint. Most were split, cut and ground from mammal long bones though several (for example,

Fig. 19n) are from bird bones and one (Fig. 19g) is a sharp fishbone that may have served as an awl. Few, if any, antler awls are present.

The commonest method of forming the awl point was to cut one or two lateral notches in the shaft near the tip and from there cut and grind a taper to the point, leaving the proximal portion wider and presumably easier to grip. The notches might or might not be ground smooth. In one instance (Fig. 19h) the notch was cut right around the shaft. The notch technique, or at least a bilateral concave taper, was used on 43 of the awls (for example, Fig. 19a-e, h-k).

Needle

A polished bone point fragment is broken across a bifacially incised hole. This is presumably a needle with a hole in the distal end though the point is not particularly sharp and it could have been the proximal end. The object measures 19.8 mm. long, though broken, by 7.1 mm. wide by 3.3 mm. thick.

Antler Punches

Two and possibly three antler tines have pointed polished tips and can be classed as punches.

Points

Thirty-three other ground bone points are complete enough to provide an idea of their original shape. Only four are complete: three flat points (Fig. 19w, x, z) and a short sturdy point 66 mm. long by 10.5 mm. wide by 7.1 mm. thick, blunt at the proximal tip. Two of the other fragmentary

points were evidently based on ribs; they have long flat but slightly curving shafts with the cancellous bone on one face being only partly smoothed. One retains 97.2 mm. of its length and is a maximum of 8.1 mm. wide and 5.3 mm. thick; the other has 74.4 mm. of its length left by a maximum of 10.5 mm. wide and 5.2 mm. thick.

Seven points are almost complete and these may be part of the same class (including Fig. 19p-u), probably projectile points. They are all sturdy, are roughly oval in cross-section and range from about 40 mm. to 110 mm. in length and from 6 mm. to 9 mm. in diameter. They are thickest toward the pointed end. Some may have been bipoints, but few examples retain even one tip.

Fourteen of the fragmentary points are comparatively small, slender and sharp. They are round or oval in cross-section and range in diameter from 2.5 mm. to 6 mm. They may be gorges or perhaps barbs of compound fishhooks.

Five of the points (Fig. 19v-z) can be classed as bipoints. The smallest example (Fig. 19v) is 3.3 mm. in diameter, round in cross-section and tapers towards both ends, which are broken. It is probably a gorge. The four other bipoints (Fig. 19w-z) are flat, ranging from 2.4 mm. to 5.3 mm. thick by 5.9 mm. to 11.1 mm. wide and about 51 mm. to 81.4 mm. long. In one case (Fig. 19y) one tip is broken and in the other cases one point is sharper than the other. Only one tip, the one shown downward on the largest example (Fig. 19z), was actually polished, probably through use. Four other flat point fragments probably come from similar objects.

Unilaterally Single-Barbed Points

Eight small bone unilaterally single-barbed points were found and five other fragments may be single-barbed points

(Fig. 20a-h). Two other points (including Fig. 20u) have one barb extant at the point, but they are too fragmentary and too large to be put in this class. All of the small single-barbed points are oval in cross-section, save one (Fig. 20e) which is kidney-shaped. Maximum shaft diameters range from 2.5 mm. to 5.3 mm.; all shafts are broken proximally so no complete lengths are available. Two of the points have lateral bulges at their proximal break, perhaps for attachment security (Fig. 20d, e). Considering that a possible barbed bone fishhook (Fig. 20v) was also recovered, some of these may be hook fragments or points from compound hooks.

Unilaterally Bibarbed Points

Six unilaterally bibarbed bone points (Fig. 20i-n) were found and three of them (Fig. 20k, l, m) are complete. One (Fig. 20l) has shallow bifacial notches cut across the shaft 1.6 mm. above the proximal tip and evidence of similar notching is found on a broken shaft (Fig. 20j). All are oval in cross-section and maximum shaft diameters range from 2.5 mm. to 4.2 mm. The complete examples (Fig. 20k, l, m) are 29.6 mm., 27.3 mm. and 33.3 mm. long respectively.

Bilaterally Multibarbed Points

There are six shaft fragments and one possible tip fragment of bilaterally multibarbed bone points. Maximum widths range from 7.5 mm. to 14.5 mm. and maximum thicknesses from 3.2 mm. to 5 mm. Only one (Fig. 20t) retains part of its tang and the tang has a small lateral node near the proximal break.

Unilaterally Multibarbed Points

Unilaterally multibarbed points (Fig. 21a-r) are mainly of bone, with three or four of antler and one of tooth (Fig. 21b). They range from the small and slender to the long and heavy. Forty specimens have the point actually or virtually intact, giving a minimum count. In addition there are 69 shaft fragments, five of them with the tang and proximal tip intact, plus one possible preform, almost complete and 115.2 mm. long.

Only five of the other points are complete or almost complete (for example, Fig. 21f, i, k, l); one (Fig. 21l) lacks one or two barbs and two of the others are slightly splintered at one end or the other. The lengths of these five range from about 62 mm. (Fig. 21i) to 140.5 mm. (Fig. 21f) though other points would have been much smaller (for example, Fig. 21g, h) and much larger (for example, Fig. 21m, n) when complete. The latter two (Fig. 21m, n) are particularly heavy, their shafts being a maximum of 15.5 mm. wide by 11 mm. thick and 14 mm. wide by 10 mm. thick respectively; both are plano-convex in cross-section. Some of the 109 shafts are round or oval in cross-section, but most are flat-oval or kidney-shaped; the shafts range from 5 mm. to 13.9 mm. wide and from 31 mm. to 8.9 mm. thick.

Most examples have enclosed barbs. Twelve examples of low isolated barbs were identified; the non-illustrated ones all have barbs like Figure 21b rather than the gaps of Figure 21r.

Of the ten tangs with proximal end intact, nine taper to a blunt tip and the tenth has a lateral bump at the tip. Another barbed shaft and tang fragment is broken proximally at the circumferential notch. These barbed points are likely fixed points as no device for line attachment is present to suggest use as harpoon heads.

Three other examples of barbed bone retain only one

barb each. Two were points, one of which has one high isolated barb (Fig. 21u). One shaft fragment also has a high enclosed barb, while the other point fragment is broken at the barb.

Fishhooks

The possible barbed bone fishhook (Fig. 20v) is broken laterally, to the right in the photograph, and its shank is missing. The point is 30.5 mm. long and 4.5 mm. thick. A fragment of worked bone (Fig. 20w) is also broken laterally; this may be a fishhook preform.

Barbed Harpoon Heads

Two unilaterally single-barbed harpoon heads were found, one with line hole and one with bilateral line guards and tang. The former (Fig. 22c) is 71.1 mm. long, 16.2 mm. wide and 3.6 mm. thick; the hole was incised from one side and is 2.8 mm. by 4.8 mm. The latter (Fig. 22b) is 77 mm. long, though the point itself is missing, and the shaft is 12.1 mm. wide by 7.1 mm. thick.

Corner-Notched Bone Point

This flat polished bone point is 64.5 mm. long, 22.2 mm. wide and 6.5 mm. thick (Fig. 22a). A similar point was recovered from Oberlander Station in New York, a type site of the Brewerton phase in New York (Ritchie 1940: Pl. 29, No. 23).

Conical Socketed Antler Tine Harpoon Heads and Antler Tine Projectile Points

Included in this category are at least two harpoon heads

(Fig. 23a, c), four projectile points (Fig. 23h-k) and 11 broken versions of one or the other (including Fig. 23b, d-g); the conical projectile points could conceivably have served as harpoon heads, but no evidence of line attachment was observed. All are of antler and, with the exception of one only slightly modified tine (Fig. 23f), the projectile points and harpoon heads had been cut and ground into shape. (For dimensions of the illustrated specimens, see Table 7.) Two of the broken points (Fig. 23b, d) have lateral holes, but no signs of working are evident and the holes may be the accidental result of walls that were too thin. Of the two definite harpoon heads, one (Fig. 23a) has a single line hole, badly splintered, and the other (Fig. 23c) has a double hole, one round and 9 mm. in diameter and the other elliptical and 4.4 mm. by 2.8 mm.; in both harpoon heads the line holes communicate with the socket. Both of the harpoon heads, both of the possible harpoon heads, two of the projectile points (Fig. 23h, k) and at least two of the fragments (including Fig. 23g) are basally barbed. Most of the harpoon heads and points are round to elliptical in cross-section. Two (including Fig. 23b, d) had been ground flat on one surface and three others, fragmentary and not illustrated, had been bifacially ground at the tips to give a lenticular cross-section and moderately sharp edges.

Bone Daggers, Knives and Fleshers

Based on the recovery of actual points, at least 15 long bone daggers, knives and/or fleshers are present, including one complete so-called dagger in addition to the one recovered from burial 9G49B (Fig. 7a) which is 251 mm. long by a maximum of 23.4 mm. wide and 7.1 mm. thick; the other complete dagger (Fig. 24a) is 246.5 mm. long by a maximum of 29.5 mm. wide and 7 mm. thick. The other bone knives and/or daggers range up to 24 mm. wide and 9.3 mm. thick. All are

long-bone sections of unidentified large mammals. Eight (including Fig. 24c-e, g, j) were partially ground along the inner or concave face and the cancellous bone partially or totally smoothed, giving a crescent-shaped cross-section and fairly sharp edges, at least at the point. These may be fleshing tools. Two points (including Fig. 24b) and two shaft fragments (including Fig. 24i) were bifacially ground to give sharp edges while one (Fig. 24a) was bifacially ground to make one edge sharp and the other, shown to the right in the figure, rounded. These sharp edges may have served as knives, but four points (including Fig. 24c, f) have both edges dull and would have been useful only as thrusting instruments, that is, as daggers.

Pendants

A moose incisor (Fig. 25a) and a black bear canine (Fig. 25b) had holes incised through their roots. An antler tine from a white-tailed deer (Fig. 25e) is scored and broken at the base and has a bifacially-bored hole 6.1 mm. in diameter through the base. Four other objects (including Fig. 25f-h), all of flat bone, are perforated at one end. One distal portion of a phalanx of a hoofed animal has a hole through the end, possibly by human agency. One left coracoid bone of a large snapping turtle is bifacially bored through the proximal end (Fig. 26a). In addition, both surfaces of the turtle bone are polished and bear shallow incised straight-line decoration.

Antler Flakers

In addition to those found in burial 9G49B, two antler tines, one a tip fragment and the other a prong from a wapiti or white-tailed deer, were slightly blunted at the

tip but otherwise unmodified. They may be flakers.

Beaver Incisor Tools

This section is based largely on a six-page report on the same prepared by Dr. Howard Savage (Savage 1970c). At least 343 beaver incisor tools were recovered, making them the single largest artifact category at the site. The difference in the numbers of left and right incisors used was not significant but 226 tools were identified as lower incisors while only 29 were recognized as uppers. Savage examined a further 87 unworked beaver incisors from the faunal remains and found the same selectivity in operation: 68 uppers to 19 lowers. This selectivity is probably explained by the facts that the upper incisors are more curved than the lowers and that the uppers are and probably were more fragile than the lowers. The most common incisor tool, 209 examples identified, was one with the distal end obliquely ground (for example, Fig. 27b-f, k-n) to give a slightly blunt point and a fairly sharp cutting edge along the enamel. In only four identified cases was the lateral corner of the end of a tooth ground flat while there were 62 cases identified where the medial corner was ground flat; right and left teeth were used in equal numbers. These tools could have been used as awls, gravers and scrapers. About 50 teeth retained a squared chisel and (Fig. 27a, f) only slightly modified from the original with grinding. Some 58 have one or both ends flat and blunt or, more often, concave (Fig. 27g-j). In only three cases (for example, Fig. 27j) is a squared or concave proximal end found on a tooth with an unmodified or beveled distal end, so it is unlikely that these squared and concave ends were primarily a means of facilitating hafting. Perhaps the concave versions were spokeshaves for wood and bone.

Porcupine Incisor Tools

Eleven porcupine incisors had been used as tools (for example, Fig. 27o, p). In four cases the end was obliquely ground to give a knife edge while in seven cases the end is straight or only slightly oblique, giving a chisel tip.

Unidentified Bone and Antler Artifacts

Fifty-two bone and antler artifacts, mostly fragmentary, are nonetheless complete enough that we can infer possible uses. They include: a heavy fragment of antler or whalebone (Fig. 28a) 86.8 mm. long by 38.8 mm. wide by 17.1 mm. thick, pierced by a bifacially-bored hole 8.5 mm. wide; a hollow shaft of antler (Fig. 28b), perhaps an adze or chisel haft, 61.3 mm. long by 28.7 mm. wide by 22.9 mm. thick, the hole averaging about 18 mm. by 11 mm., and the shaft scored and broken at one end and circumferentially tapered at the other; a similar hollow antler shaft, 68.8 mm. long, though broken, by 24.7 mm. wide by 22.1 mm. thick, the hole averaging about 14 mm. by 10 mm. and the one end extant irregularly ground smooth; a solid shaft of antler (Fig. 28c 49.1 mm. long by 20 mm. wide by 16 mm. thick, deeply scored) and broken at either end; a bone shaft (Fig. 28d) with 57.5 mm. extant of its length, 13.1 mm. wide by 13.2 mm. thick, broken across a bifacially incised hole at one end, with bifacially opposite incisions for a second hole next to the hole, and a unifacial slot 32 mm. long opening to the other tip, which is intact; a slightly curved piece of polished bone (Fig. 28e) 31.6 mm. long, though broken, by 16.9 mm. wide and 3.7 mm. thick, squared across the intact end; a notched, complete artifact of polished bone, 13.6 mm. long by 10.2 mm. wide by 6.8 mm. thick (Fig. 28f); a perforated

tube of hollow bird bone (Fig. 28g) 7.1 mm. wide by 5.5 mm. thick, the holes incised, the shaft broken across a double hole at one end; a unilaterally barbed bone shaft fragment (Fig. 28h) 37 mm. long by 5.9 mm. wide by 3.7 mm. thick; one antler and six bone splinters with one or more shallow notches along one edge; 14 antler tine tips (including Fig. 28i-n) notched and broken proximally, with one example (Fig. 28j) notched and broken distally as well; one ground bone fragment similar to the antler tips; a notched and pointed fragment (Fig. 28o) of the left metatarsal bone, proximal shaft, of a small wapiti, 100.2 mm. long by 24 mm. wide by 9.9 mm. thick; three polished bone shaft fragments, all about 9 mm. by 4 mm., with zigzag or parallel shallow lines incised across one face; four small bone and antler points, complete, from 19.3 mm. to 23.3 mm. long by a maximum of from 5 mm. to 7.8 mm. thick, tapering to a narrow blunt tip at one end and a point at the other, with a unifacial hump near the point (Fig. 26b); a possible base fragment of a socketed antler artifact, with a shallow groove incised across the outer face; a thin plate of cancellous bone, curved, 2.5 mm. thick and fragmentary with one edge polished and bands of short oblique incisions with a rim band beneath along both faces of the finished edge; two small shafts of bone, polished, broken at a notch at one end, one of them 30.5 mm. long, though broken at both ends, by 5.6 mm. wide and 4.3 mm. thick, and the other 31.9 mm. long by 7.8 mm. wide by 4.5 mm. thick, with one end unbroken, being narrow and squared; a polished bone shaft 63.8 mm. long by 7.5 mm. wide by 5.2 mm. thick, narrow and spatulate at one end and blunt at the other; a narrow polished bone shaft 41.3 mm. long though broken at one end, with a diameter of 4 mm., unilaterally notched at one end; a shaft of ground bone 38.9 mm. long by 10.6 mm. wide by 7.4 mm. thick, squared at both ends; one polished and squared bone tip fragment, 10.2 mm.

wide at the tip by 4 mm. thick; three polished bone shaft fragments with bilateral nodes; a bone tip fragment 16.2 mm. long, though broken, by 9.5 mm. wide and 3.9 mm. thick, bilaterally concave; and a curious hollow bone broken at a notch at one end.

Uses of or reasons for some of the aforementioned can be suggested: the antler tip fragments (Fig. 28i-n) and the shaft fragment may just be wastage in the formation of other tools; Figure 28g may be a whistle; the hollow antler tubes (Fig. 28b) may be hafts for other tools; some of the notched objects may be preforms or children's attempts at barbed bone points, and the bilaterally noded shafts may be tang fragments of fixed bone points.

Copper Artifacts

Thirty objects of native copper were recovered. Nine of them are scraps too small and corroded for any further identification and four of them are slender slivers (for example, Fig. 29d) that may be gorges or perhaps awl fragments. Two of the artifacts, a fishhook (Fig. 29g) and a tanged point (Fig. 29e) were submitted to the Physical Metallurgy Research Laboratories, Canada Centre for Mineral and Energy Technology, Department of Energy, Mines and Resources, for examination (Couture 1969). Couture found that the two had been manufactured from essentially pure, probably native copper, and that there were traces of silver in the copper of the point. In the Northeast, silver traces in copper are often assumed to imply a Lake Superior origin, but this is not necessarily so. Couture used only a small area of the surface of each artifact when examining the microstructure so as to not alter the shapes of the objects. Consequently, while he noted no evidence of annealing or hammering, he was unable to be categorical in his

interpretation.

Awls

Three artifacts were classed as awls. The one in best condition (Fig. 29b) is 70.2 mm. long, 4.8 mm. wide and 3.5 mm. thick; it is rectangular in cross-section. Another (Fig. 29c) is 39.2 mm. long, 4.7 mm. wide and 3.2 mm. thick; it is roughly plano-convex in cross-section. The third (Fig. 29a) is 80.5 mm. long, though curved, by an average of 2.7 mm. thick; it is square in cross-section. In addition, six small pointed copper pieces could be awls; they range from 20 mm. to 32 mm. long, mean 27.2 mm., 2.5 mm. to 3.9 mm. wide and from 1.8 mm. to 3 mm. thick.

Point

One flat stemmed copper point was found (Fig. 29e). It is 55.3 mm. long, 24.3 mm. wide and 3 mm. thick. In cross-section it is a flat hexagon, the faces flat and the edges bevelled. This is commonly known as an "Ace of Spades" point in Wisconsin and the northern peninsula of Michigan where they are not common, but recognized as a typical Old Copper trait. Quimby and Griffin note, however (1961: 103-4), that leaf-shaped flat-tanged knives are not always Old Copper, but may date to the late Archaic or Early Woodland. One of the five Ace of Spades points that Hruska (1967) recovered from the Riverside site in the northern peninsula of Michigan shows marks of the wood grain on the tang, nicely rounded at the base of the leaf; the position of the point shows that the shaft could have been no more than 30 in. long, though admittedly the shaft could have been broken. In any case, whatever its use at Coteau, the

point is undoubtedly a trade item originating in the Upper Great Lakes.

Fishhooks

The five specimens (Fig. 29f-j) range from 25 mm. to 47.3 mm. long and 1.4 mm. to 2.4 mm. in diameter; the shafts are irregular quadrilaterals in cross-section. Two other curved pointed fragments of copper may come from hooks.

Pottery

Coteau-du-Lac cannot be considered an important pottery site. Just 106 sherds were recovered, weighing a little more than 600 g. Two traditions were identified from the pottery, Point Peninsula and Iroquoian, with most sherds attributed to the former. Nine sherds are very small with no discernible decoration and seven fragments of baked clay may or may not be artifacts. These will not be discussed nor will one crude rimsherd (Fig. 31a); its decoration consisted of irregular shallow castellations on the exterior.

Point Peninsula

Eighty-four sherds (Fig. 30a-l, o) have been attributed to the Point Peninsula tradition of the early Middle Woodland Stage (Ritchie and MacNeish 1949).

Cord-Wrapped Stick

Thirteen sherds, four of them rimsherds (Fig. 31f, h-j) have cord-wrapped stick impressions, two of the sherds with punctates (Fig. 30a, b), one (Fig. 30a) with one row of

dentates extant at the break, and another with cord-malleations on the exterior below two horizontal rows of corded stick and a row of possible shallow punctates.

Pseudo Scallop Shell

Six sherds of St. Lawrence pseudo scallop shell (Ritchie and MacNeish 1949: 103), including four rimsherds (Figs. 30f-h, 31b-d), were recovered.

Complex Dentate

Four sherds inferred to be decorated by involved dentate stamping (Fig. 30i, l) were recovered, including two (for example, Fig. 30i) with superimposed incised lines over what resembles Malcolm push-pull (Dailey and Wright 1955: Fig. 7, No. 1).

Cord-Malleated

Four sherds with cord-malleated exteriors (Fig. 30j) were found in addition to the cord-wrapped stick-impressed example already mentioned.

Vinette Dentate

Twenty-one sherds of dentate stamped pottery (Fig. 30k, o), including two rimsherds (Fig. 31e, k) were classed as Vinette dentate (Ritchie and MacNeish 1949: 100).

Plain

There are 35 sherds of smooth pottery with no decoration;

only one (Fig. 31g) is a rimsherd.

Iroquoian

Five incised sherds (for example, Fig. 30m, n) including one rimsherd (Fig. 31l) have been identified as characteristically St. Lawrence Iroquoian.

Untyped

One potsherd is decorated with rows of parallel shallow strokes about 12 mm. long, probably impressed by a small stick hitting the clay surface obliquely, producing laterally scraped channels.

Conclusions

Most of the comparisons and definitions in this paper are made according to Ritchie's chronology and typologies of New York prehistory. This is as it should be for northern New York state is within the St. Lawrence valley and not far from Coteau-du-Lac. Ritchie has created the definitive body of work on New York prehistory and his synthesis of northern New York prehistory is entirely applicable to the central St. Lawrence valley in Canada.

One of Ritchie's tenets has, however, been questioned in recent years: his postulation of the Archaic and Woodland stages as distinct patterns of ecological adaptation and technological development. J.V. Wright is one of the main expositors on this matter, maintaining that the introduction of pottery is the only significant signpost at the Archaic-Woodlands crossroads so that "the end of the Archaic period, however, is an archaeological convenience, not a cultural fact" (Wright 1971: 3). While Wright may well have identified a continuous and fairly gradual sequence of prehistoric cultural change in southern Ontario, this writer knows of no published synthesis of that sequence aside from Wright's elementary Ontario Prehistory (1972). Given the tremendous lag in Quebec archaeology, moreover, we do not have enough professionally excavated and analyzed sites available to define local cultural evolution without reference to Ritchie's schema for northern New York.

So, while it would be most attractive to infer that our Point Peninsula-Middle Woodland occupants of Coteau-du-Lac

were the "direct descendants" of the earlier Laurentian Archaic people (Wright 1972: 44), the differences between Laurentian and Point Peninsula components are simply too profound to admit of any direct link without other evidence.

The Laurentian Tradition

The Laurentian tradition of the Archaic is well represented at Coteau-du-Lac. Diagnostic artifacts include 2 Otter Creek points (Fig. 14n, o), at least 9 Brewerton side-notched points (Fig. 14a-g, i, j), at least 1 Brewerton eared-notched point (Fig. 14l), 6 plummets (Fig. 10a-f), 1 winged bannerstone (Fig. 7i), at least 2 gouges (Fig. 9p, r), as many as 6 adzes (Fig. 9d-h, m), at least 5 ground stone ulus (Fig. 10f-i, l), at least 9 other flat ground slate knives (Fig. 10j, k, m-p), at least 15 ground stone points and/or knives (Fig. 11a-m), 5 copper fishhooks and at least 3 copper awls (Fig. 29), and numerous barbed bone points (Fig. 21) though the barbed bone points are just as characteristic of Middle Woodland sites and such copper artifacts are fairly common on Woodland sites as well.

The tanged copper point (Fig. 29e) should also be included with the Laurentian material (Fitting: pers. com.) as it is probably a trade item originating from the so-called Old Copper culture of the upper Great Lakes. Such points are a recognized type known as "Ace of Spades" points in the upper peninsula of Michigan and in northern Wisconsin, but are not especially common and have not been reliably dated.

The two Otter Creek points from Coteau (Fig. 14n, o) suggest a possible Vergennes occupation though Otter Creek points occasionally occur at lower levels of Brewerton sites (Ritchie 1969: 86, 89). Ritchie considers the lower St. Lawrence region to be the nuclear area of the Laurentian

tradition and the Vergennes phase "the oldest and best delineated" Laurentian manifestation, containing all of the diagnostic Laurentian traits (Ritchie 1968: 2-3). Since all of these traits are present at Coteau and since components of other Laurentian phases rarely contain all of these traits (Ritchie 1968: 4), we may infer a Vergennes occupation at Coteau-du-Lac. As currently known and defined, the Vergennes phase is limited to the Lake Champlain-Richelieu River drainage, the St. Lawrence valley and the Ottawa valley, though the Otter Creek point itself can be considered a regional variety of an early and widely distributed Archaic point type found throughout the Midwest and eastern United States (Cleland and Peske 1968: 42).

The best-dated Vergennes site currently known is the Alumette Island site in the Ottawa River near Pembroke, radiocarbon dated at 3270 B.C. ± 80 (Kennedy 1970: 255). Bécancour, across the St. Lawrence from Trois-Rivières, has also yielded Otter Creek points in recent excavations (Thibeault 1974: 18), but the Vergennes phase is still poorly documented in its supposed core area.

Considering the nine Brewerton side-notched and the one or two Brewerton eared-notched points recovered (Fig. 14a-g, i, j, l, m), the main Archaic occupation of Coteau was during the Brewerton phase which may well have been a direct development of the Vergennes phase (Kennedy: pers. com.). Both share essentially the same artifact complex and most of the Laurentian artifacts from Coteau-du-Lac would fit equally well on a Vergennes or a Brewerton site. The Brewerton phase had been radiocarbon dated at 2050 B.C. 220 and 2010 B.C. ± 100 (Ritchie 1969: 91) in its nuclear area of central New York, but its range includes western, central and northern New York and the St. Lawrence and Ottawa river valleys. Morrison's Island No. 6 in the Ottawa River is a Brewerton-related site that has been dated at

2750 B.C. ± 150 (Kennedy 1970: 114), the oldest Brewerton date now known.

Also attributable to the Brewerton phase among the Coteau artifacts are the corner-notched bone point (Fig. 22a; cf. Ritchie 1940: Pl. 29, No. 23, p. 83) and the barbed harpoon with line hole (Fig. 22c), both of which are considered diagnostically Archaic.

Late Archaic

A probable but undefined late Archaic manifestation is present in the form of ten Lamoka points (Fig. 15a-d, f-k). The term "Lamoka" is used here merely as a regional expression of the narrow stemmed point tradition, consisting of an Archaic point type known by various names in coastal New England, New York, Illinois, southern Michigan and the upper and central Ohio valley (Turnbaugh 1974: 15). The point type's range extends also into southern Ontario (Ritchie: 1961: 29), but it must be remembered that the characteristic point is usually the only diagnostic trait shared by members of the tradition. The presence of "Lamoka" points does not necessarily imply Lamoka culture at Coteau, especially as the bevelled adze, the other diagnostic artifact type of the Lamoka phase (Ritchie 1936), is absent.

Narrow stemmed points overlie Laurentian deposits in Michigan (Fitting 1970: 71-2) and in eastern New York and southern New England where such instances have been radiocarbon dated to around 2200 B.C. (Ritchie 1971: 5). The Lamoka culture per se probably originated before 2500 B.C. in western New York (Ritchie 1969: 78-9). Ritchie (1971) sees the Laurentian and the narrow point traditions as essentially contemporaneous, with the former diffusing south from its St. Lawrence homeland and the latter north

from the Middle Atlantic region. Central New York was likely an area of encounter and overlap, but further north the narrow points postdate the older Laurentian stratum.

Coteau-du-Lac represents one of the most northerly discoveries of the narrow stemmed points although Johnston (1968: 9) may have found it at the Serpent Mounds site in central Ontario and Thibeault (1974: 18) reports that in 1973 National Museum of Man staff found Lamoka points at Bécancour across the St. Lawrence from Trois-Rivières.

Middle Woodland

The bulk of the bone, antler and tooth artifacts from Coteau-du-Lac strongly suggests a Middle Woodland origin, specifically the early Point Peninsula tradition (Ritchie 1969: 205-14; Funk: pers. com.). The small quantity of pottery recovered (Fig. 27a-l, o) tends to support this. Most of the characteristic bone, antler and tooth artifact types are also found among various Archaic components, however, and cannot be considered uniquely diagnostic in a mixed assemblage. This includes the barbed bone points, the bone fishhooks, the bone awls, the perforated teeth and the conical antler projectile points. De Laguna, for example, (1946: 121) considers the barbed bone point to be a trait passed on from the Laurentian to the Point Peninsula culture. Only the toggle head antler harpoons (Fig. 23b, d) and the bone daggers (Figs. 7a, 24) are specifically a Middle Woodland trait and even then Kennedy (pers. com.) reports a possible bone dagger from Morrison's Island No. 6, a Brewerton site. Funk also considers the broad chipped slate blades (Fig. 18) to be characteristically Middle Woodland (pers. com.) though similar blades are not unknown in Archaic settings.

The Point Peninsula tradition is part of a general Lake

Forest Middle Woodland complex stretching from southern Manitoba and Minnesota through the Great Lakes region, the Ottawa and St. Lawrence basins into northern New England, New Brunswick and even to the coast of Labrador. Much of this is, in fact, the same zone previously occupied by Laurentian peoples. Similar pottery types are the main cohesive element of the Lake Forest Middle Woodland traditions, but all members show a similar style of adaptation and environmental exploitation utilizing a broad spectrum of resources and especially, at least in comparison with Archaic peoples, putting at least as much emphasis on fishing as on hunting. Early Middle Woodland components in Canada have been dated at 668 B.C. ± 220 at the Burley site in Ontario (Jury and Jury 1952: 70) and 519 B.C. ± 60 at the Donaldson site in Ontario (Wright and Anderson 1963: 50).

Late Woodland

Two incised Iroquoian sherds (Fig. 30m, n) testify to an at least brief presence of Iroquois at the site. The Iroquois tradition had become established in the St. Lawrence valley by the 14th century A.D. and it was Iroquoians that Cartier met at Stadacona and Hochelaga duringhis voyages in 1535 and 1541. These Iroquoians seem to have disappeared toward the end of the 16th century, but just what happened to them has never been resolved though evidence of their occupation is found throughout the St. Lawrence and Ottawa valleys. Earlier theories that the St. Lawrence Iroquois were a northern branch of the New York Onandaga (for example, MacNeish 1952: 57) have now been largely discounted (for example, Tuck 1971: 206-7).

Summary

At least 1,756 artifacts representing prehistoric use or occupation of the site were recovered from Coteau-du-Lac, mainly from the cloverleaf bastion. Of this total, 1,421 artifacts were of bone, antler or tooth, 123 were of pecked and ground stone, 85 of chipped and flaked stone, 106 of pottery and 21 of copper. Only 203 artifacts have been definitely attributed to recognized phases or traditions, of which at least four have been identified. They are the Laurentian tradition, specifically the Brewerton phase and probably the Vergennes phase as well, represented by at least 87 artifacts; an unidentified late Archaic manifestation, represented by ten projectile points; an early Point Peninsula occupation in evidence from at least 104 artifacts, most of them potsherds, and a minor Iroquoian presence, represented by five potsherds. Many of the other artifacts could have been tentatively assigned to one phase or another, but the nature of the site and frequent similarities in artifact typology between different phases or traditions made this pointless.

Enough data have been found, in any case, to demonstrate that part of the fort at Coteau-du-Lac has been intermittently occupied or otherwise used for some 5,000 years, principally as a hunting and fishing station, but also as a cemetery and probably as a portage and rest-camp site.

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TABLES

Table 1. Dimensions (in mm.) of Adzes, Celts, Chopper and Gouges Illustrated in Figure 9

Figure Ref.	Length	Width	Maximum Thickness
a	177.8	70.5	28.0
b	*	38.8	11.0
c	*	52.6	12.1
d	*	47.7	14.4
e	102.5	52.7	20.4
f	102.3	39.1	22.2
g	*	27.0	11.9
h	*	41.6	6.8
i	58.2	40.2	10.1
j	*	52.8	8.7
k	*	52.7	19.0
l	102.2	48.2	22.8
m	119.5	60.0	32.0
n	104.5	54.0	23.3
o	103.5†	55.3	14.5
p	*	36.9	20.4
q	*	40.3	29.0
r	*	35.1	22.0

* Too fragmentary for meaningful measurement.

† Almost complete.

Table 2. Dimensions (in mm.) of Ground Stone Knives Illustrated in Figure 10

Figure Ref.	Maximum Blade Thickness	Heel Thickness
f	5.2	5.2
g	3.9	3.9
h	6.5	3.0
i	10.2	19.2
j	3.8	*
k	5.2	*
l	5.4	12.1
m	7.5	2.0
n	4.3	*
o	4.4	*
p	4.1	2.9

* Too fragmentary for meaningful measurement.

Table 3. Dimensions (in mm.) of Ground Stone Points Illustrated in Figure 11

Figure Ref.	Length	Width	Maximum Thickness
a	*	39.8	5.0
b	*	32.6	7.5
c	*	30.5	6.2
d	*	29.8	6.6
e	*	32.0	4.2
f	57.0†	29.7	7.1
g	*	*	5.3
h	32.5†	28.0	5.4
i	*	*	4.5
j	*	*	3.0
k	*	*	4.4
l	*	16.5	4.7
m	24.6†	5.3	1.7
n	*	28.4	3.3
o	*	18.2	3.9
p	47.7	17.4	5.5
q	53.0	25.5	5.9
r	84.0	22.8	8.4

* Too fragmentary for meaningful measurement.

† Almost complete.

Table 4. Dimensions (in mm.) of Pointed Slate and Sandstone Objects Illustrated in Figure 12

Figure Ref.	Length	Maximum Width	Maximum Thickness
a	50.0	19.8	8.6
b	53.6	9.1	5.3
c	46.8	12.8	6.0
d	46.0	15.5	4.5
e	33.6	14.9	6.2
f	21.0	6.1	2.5
g	19.8	8.0	6.7
h	*	33.3	9.2
i	*	36.2	18.8
j	*	33.2	10.8
k	205.4†	58.6	23.6

* Too fragmentary for meaningful measurement.

† Almost complete.

Table 5. Dimensions (in mm.) of Untyped Chipped Stone Points Illustrated in Figures 15 and 16

Figure Ref.	Length	Width at Shoulder	Maximum Thickness
15l	20.8	11.7	2.6
15m	20.7	10.8	3.7
15n	16.3	12.4	3.7
16a	48.5	16.0	8.7
16b	68.0	18.8	5.5
16c	52.0	36.4	5.3
16d	58.4	35.1	7.6
16e	*	26.3†	8.4
16f	*	28.0	4.9
16g	*	33.5	7.1
16h	*	28.2	7.9
16i	*	31.7	5.8
16j	38.0	15.4	4.3
16k	*	14.3	5.5
16l	*	23.5	8.4
16m	47.5	23.0	6.9
16n	49.0	25.5	7.9
16o	53.7	28.1	10.1
16p	92.9	36.6	8.7
16q	69.2	27.2	7.5
16r	65.1	22.4	8.1
16s	58.7	18.4	10.9
16t	83.5	29.2	10.2

* Too fragmentary for meaningful measurement.

† Almost complete.

Table 6. Dimensions (in mm.) of Chipped Scrapers and Knives Illustrated in Figure 17

Figure Ref.	Length	Width	Maximum Thickness
a	31.3	26.2	9.1
b	22.4	16.3	5.0
c	35.6	26.5	12.3
d	27.8	22.2	4.6
e	19.0	17.6	2.7
f	32.6	13.1	11.0
g	41.6	29.0	6.2
h	23.8	14.2	9.1
i	20.0	14.0	5.4
j	*	20.6	6.2
k	57.4	41.4	16.7
l	83.9	40.5	10.5
m	33.7	32.8	8.7
n	34.1	24.3	4.6

* Too fragmentary for meaningful measurement.

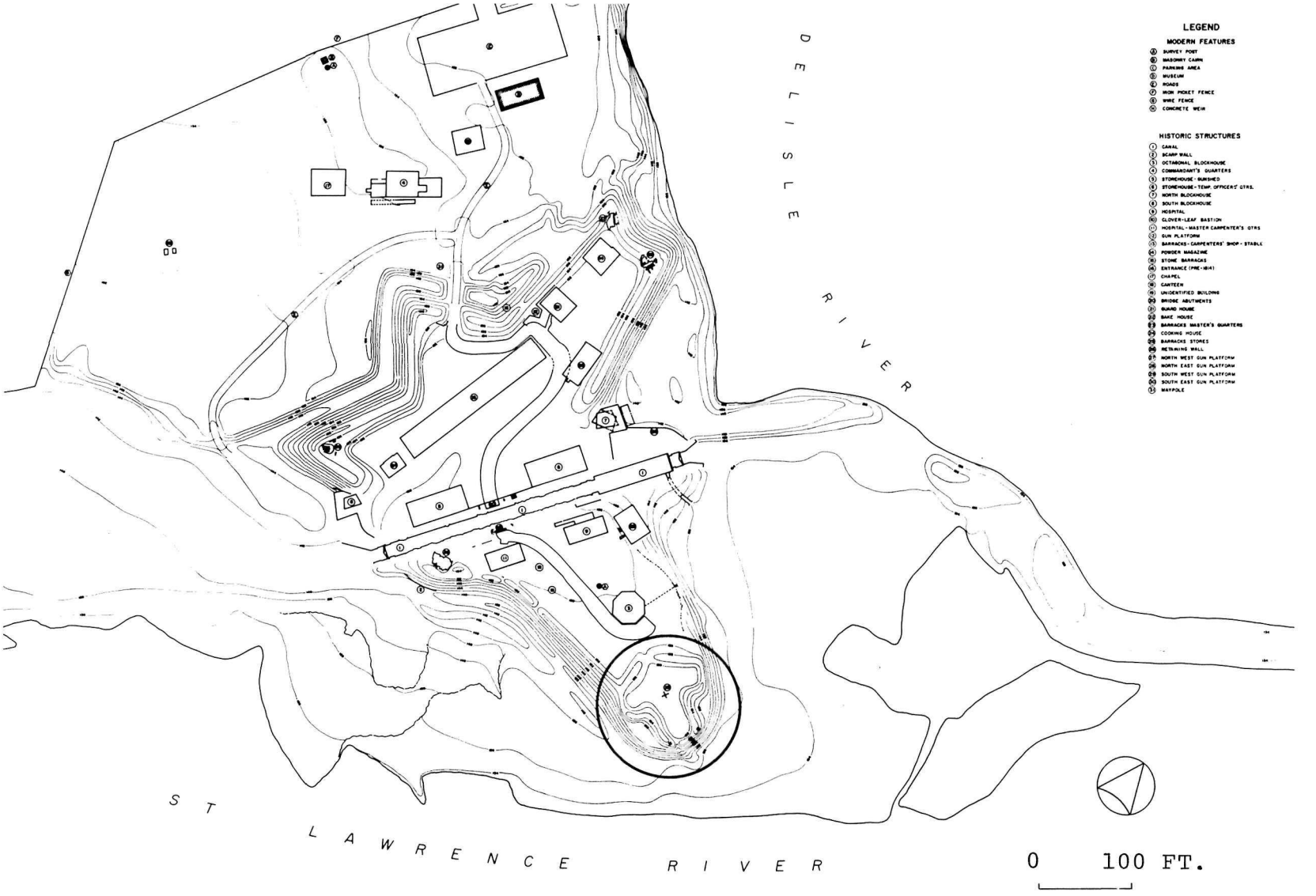
Table 7. Dimensions (in mm.) of Conical Socketed Antler Harpoon Heads and Antler Points Illustrated in Figure 23

Figure Ref.	Length	Width	Thickness	Socket Dimensions
a	32.3	17.5	17.3	10.0 x 10.0
b	47.2	16.5	16.4	10.5 x 10.8
c	*	15.6	14.5	8.1 x 8.5
d	63.5	19.6	16.1	9.5 x 11.5
e	*	16.0	10.2	*
f	97.0	16.1	*	*
g	12.4	17.0	13.9	10.5 x *
h	63.2†	21.7	17.7	11.8 x 9.5
i	44.9	14.5	14.2	9.2 x 9.1
j	36.2	13.1	11.4	7.5 x 8.2
k	*	12.5	11.3	7.3 x 8.5

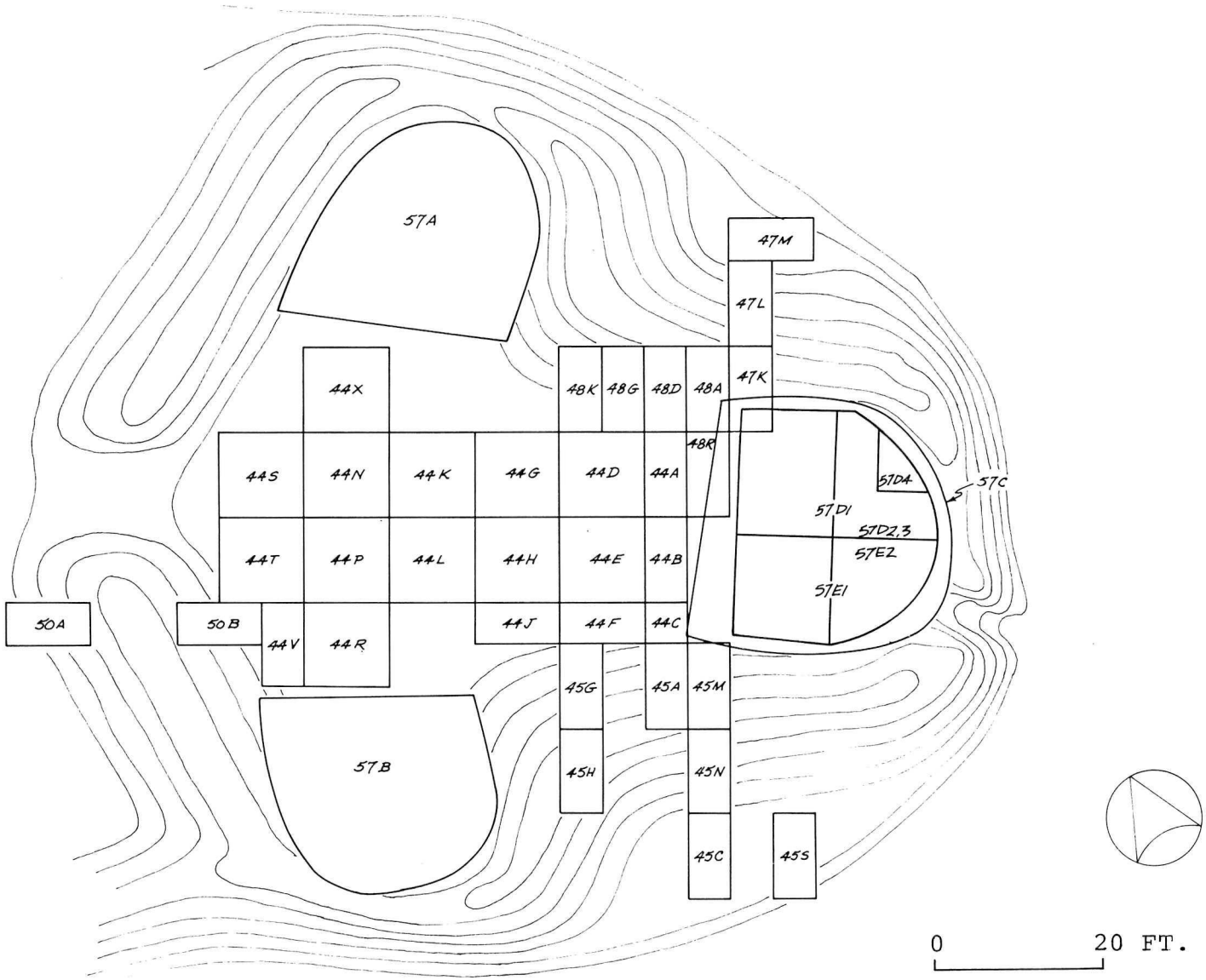
* Too fragmentary for meaningful measurement

† Almost complete.

ILLUSTRATIONS



1 Site plan: the fort at Coteau-du-Lac. Circle marks the cloverleaf bastion. (Drawing by A.E. Wilson.)



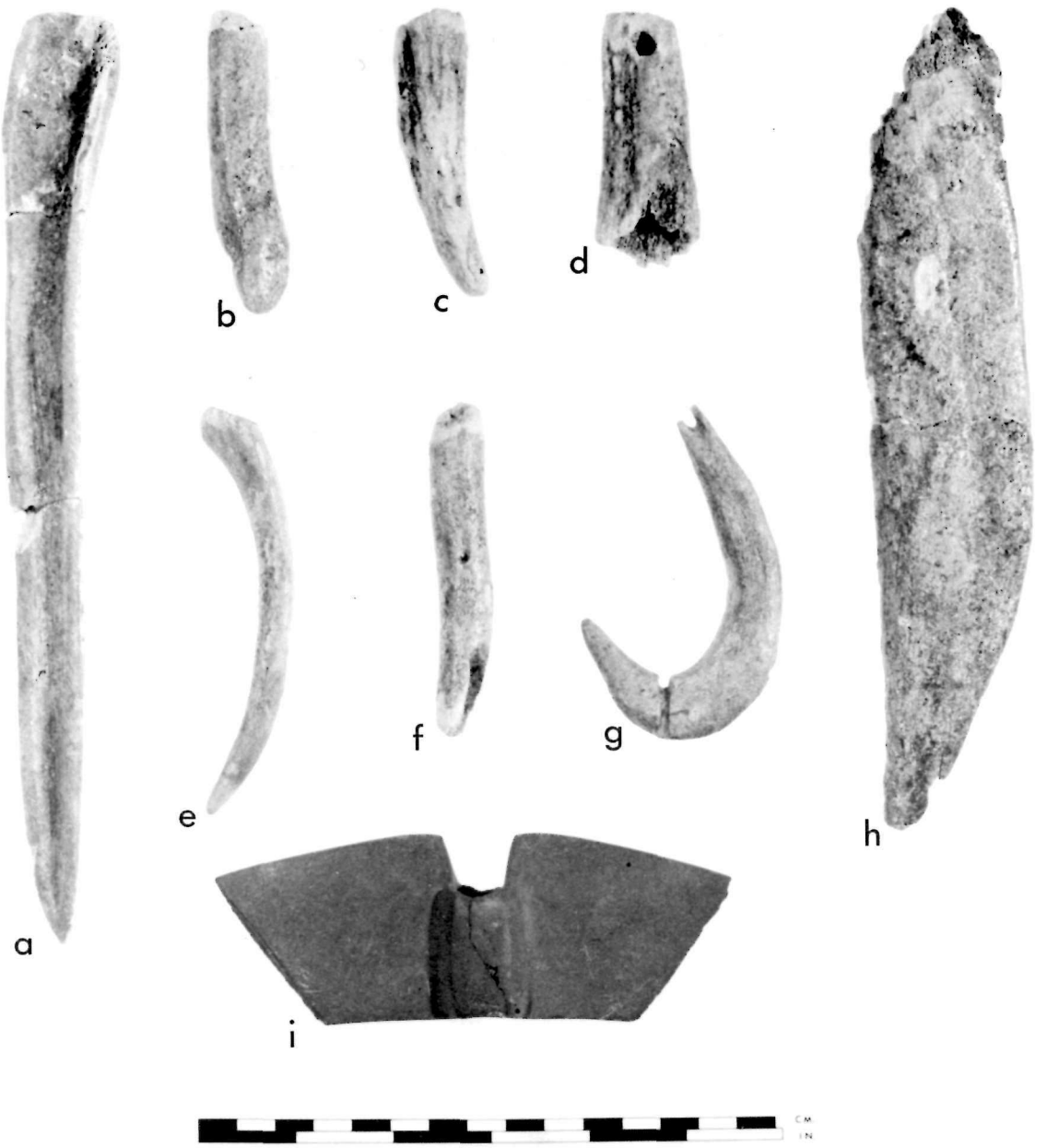
2 Excavation units of the cloverleaf bastion. Not shown are 9G10A1 in the centre of the bastion; burial 9G49A, lying across the grid line between the northern halves of 9G45A and 9G45M, and burial 9G49B, in the southern half of 9G45A. (Drawing by A.E. Wilson and S. Epps.)

3 View of the eastern lobe of the clover-leaf bastion (9G57D4). Arrow points north. (Photo by R. Lueger.)

4 View of burial 9G49A. Arrow points north. (Photo by J.-P. Cloutier.)

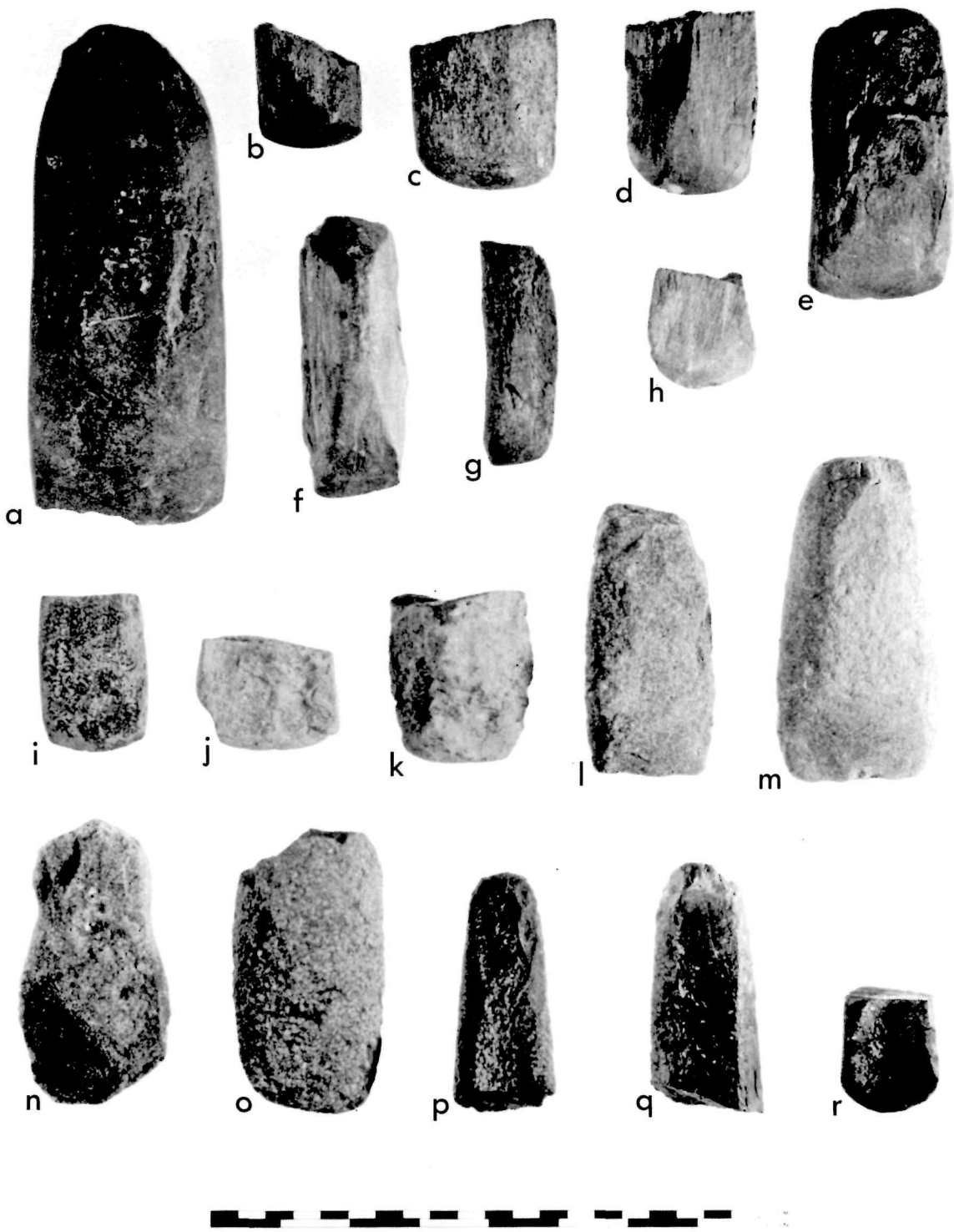
5 View of burial 9G49B. Arrow points north. (Photo by R. Marois.)

6 Detail of burial 9G49B. (Photographer unknown.)

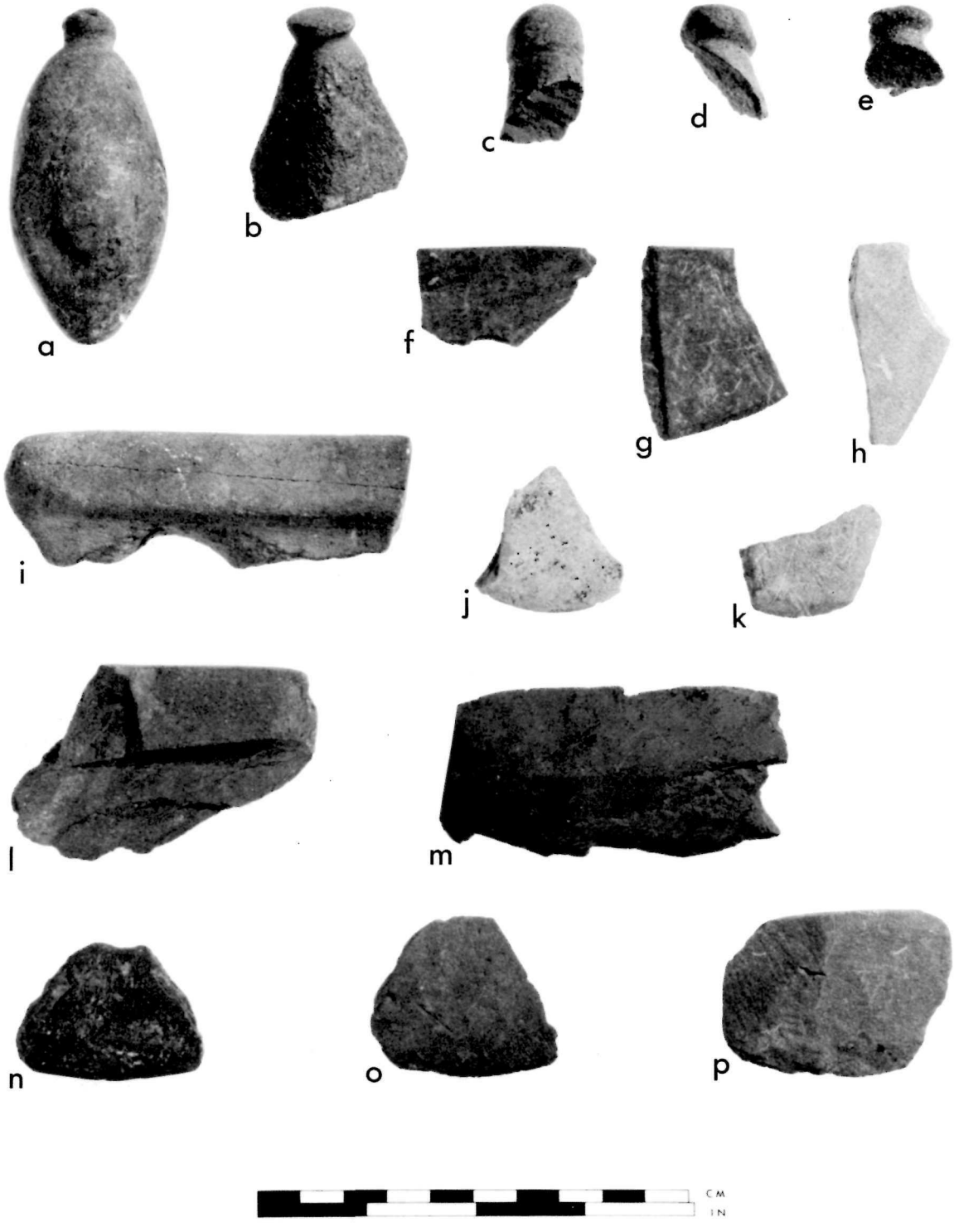


7 Burial goods from 9G49B: a, dagger; b, c, e, f, antler flaking tools; d, partially perforated antler tine; g, antler hook-like object; h, pointed antler object, and i, winged banner-stone. (Photo by J. Jolin.)

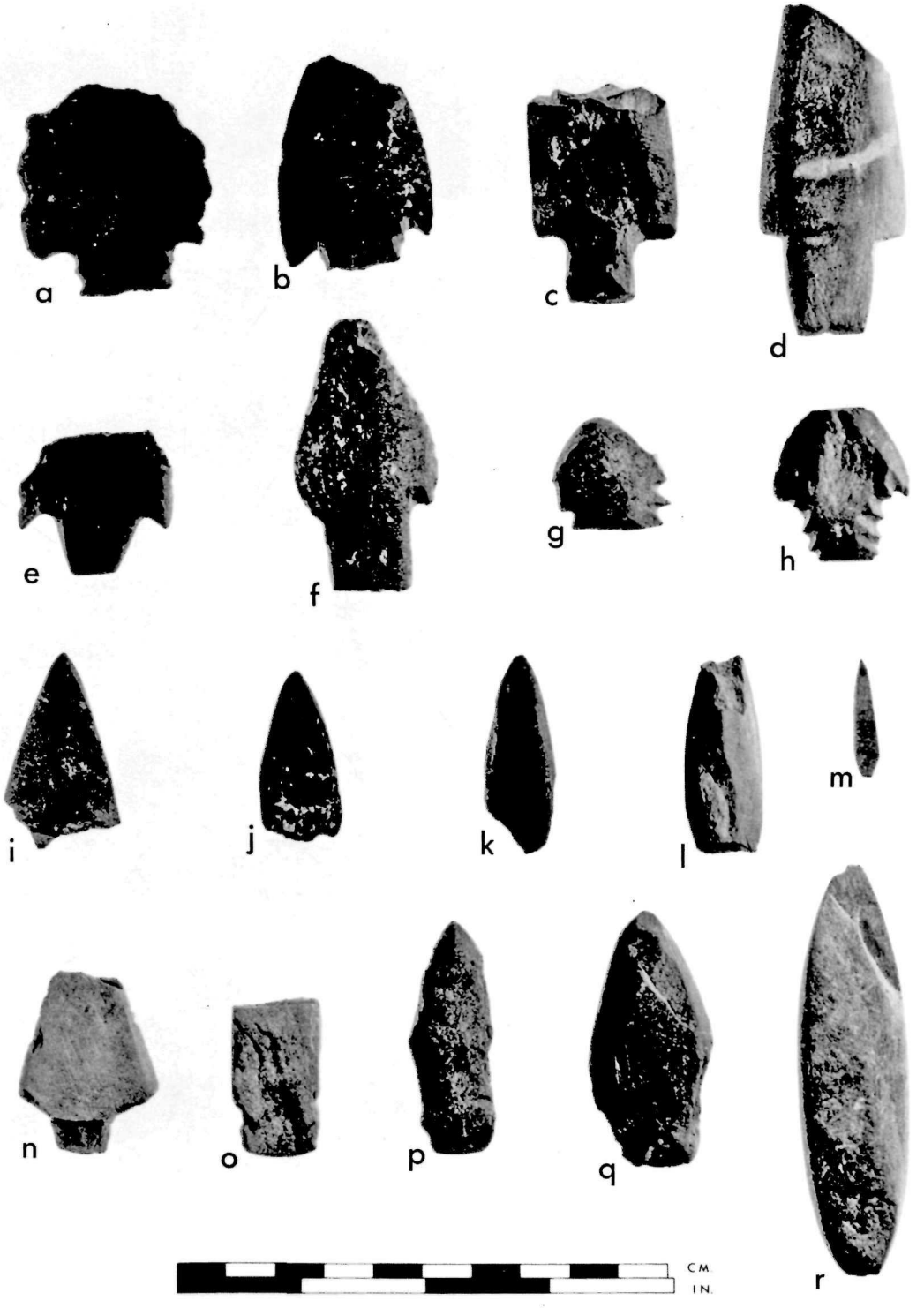
8 Anthropomorphic stone from burial 9G49B. (Photo by J. Jolin.)



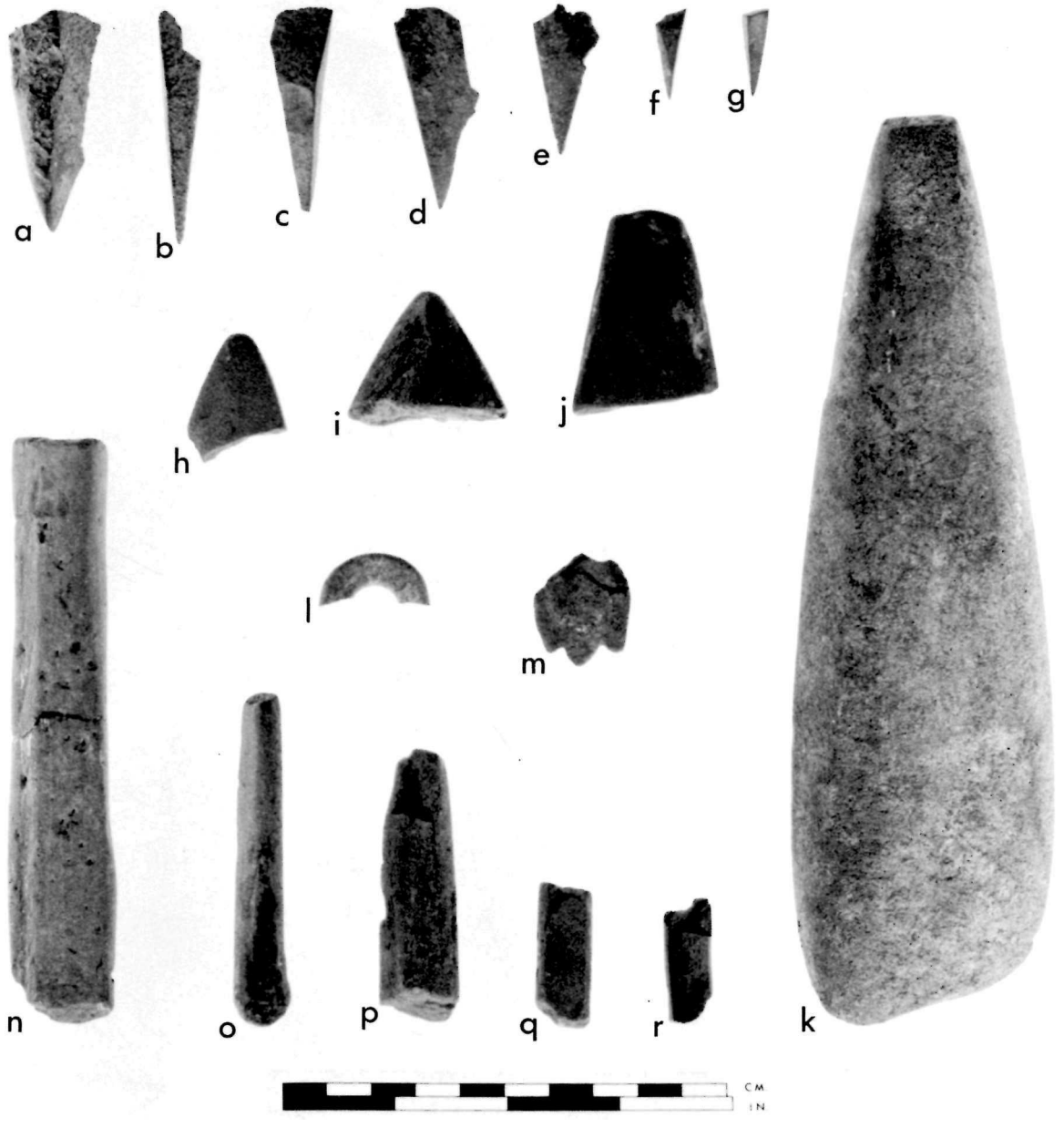
9 Adzes, celts, chopper and gouges: a, b, c, l, celts; d, e, f, h, k, m, adzes; g, chisel or adze; i, j, flat adze-like tools; n, possible chopper; o, possible adze preform or scraping tool; p, r, gouge fragments, and q, possible gouge preform. (Photo by J. Jolin.)



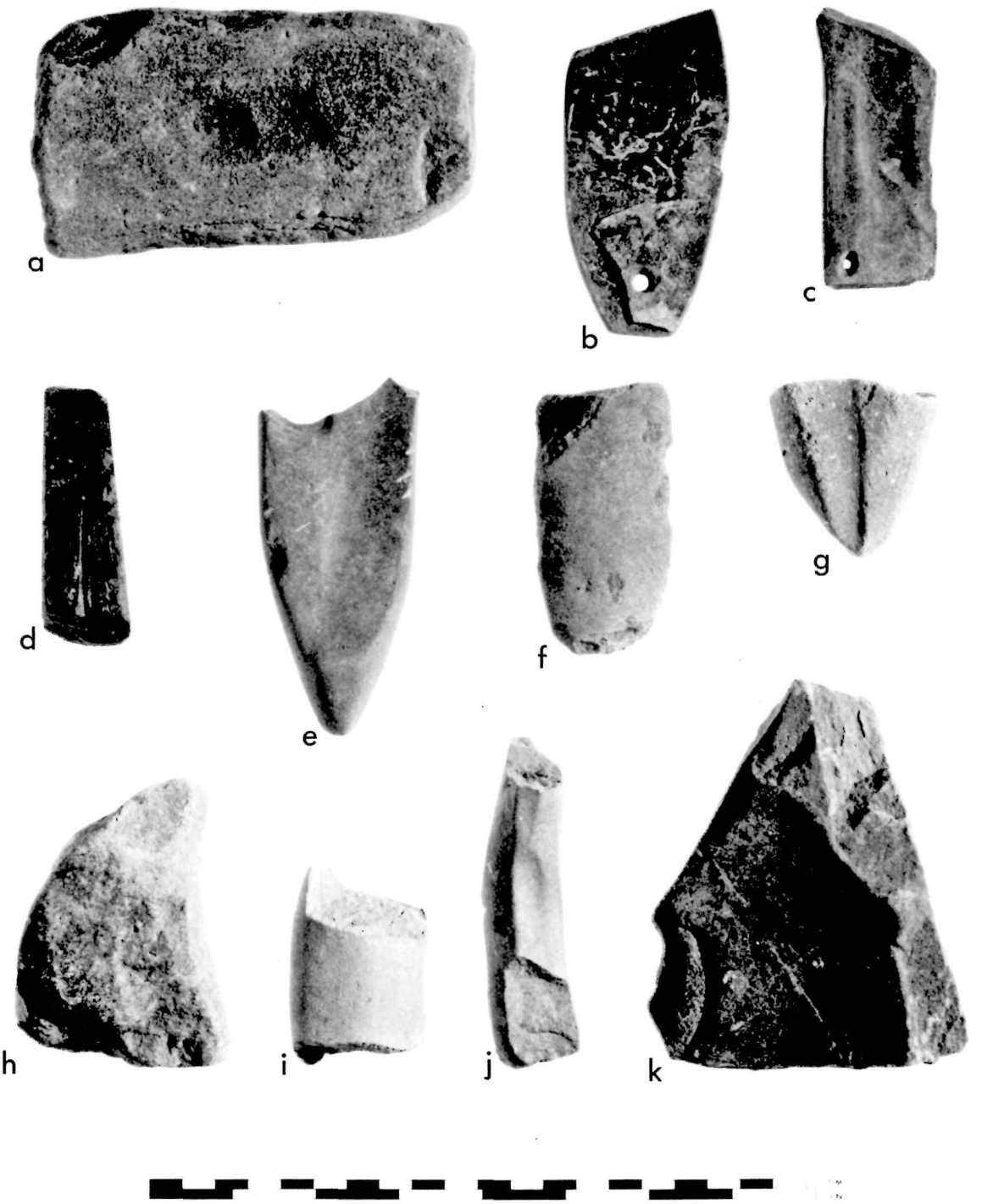
10 Pecked and ground stone artifacts: plummets and ground stone knives: a-e, plummets; f-h, flat semilunar knives; i, l, ridged semilunar knives, and j, k, m-p, ground stone knife fragments. (Photo by J. Jolin.)



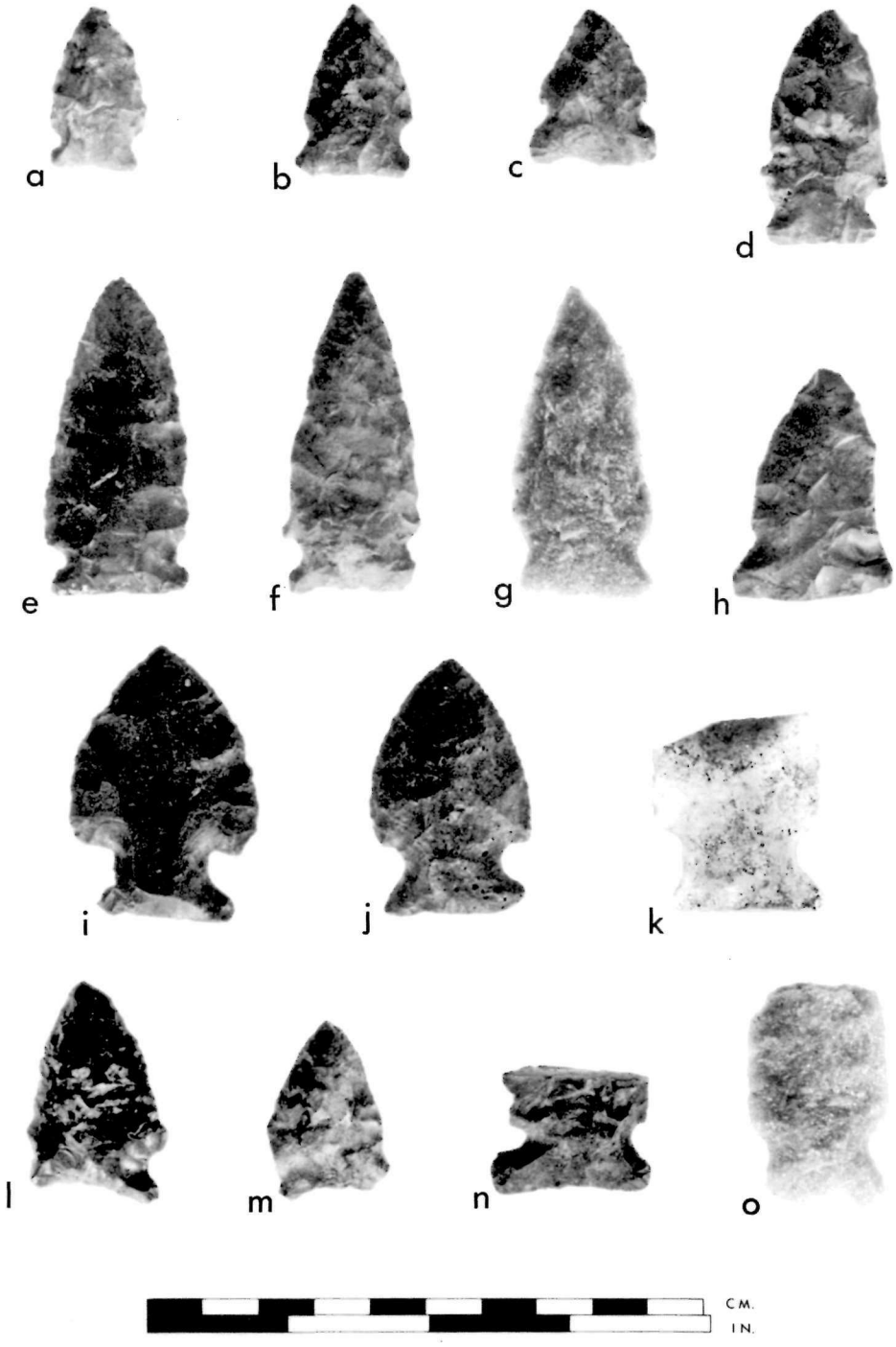
11 Ground stone points: a-h, base fragments; i-m, point and blade fragments, and n-r, probable preform fragments. (Photo by J. Jolin.)



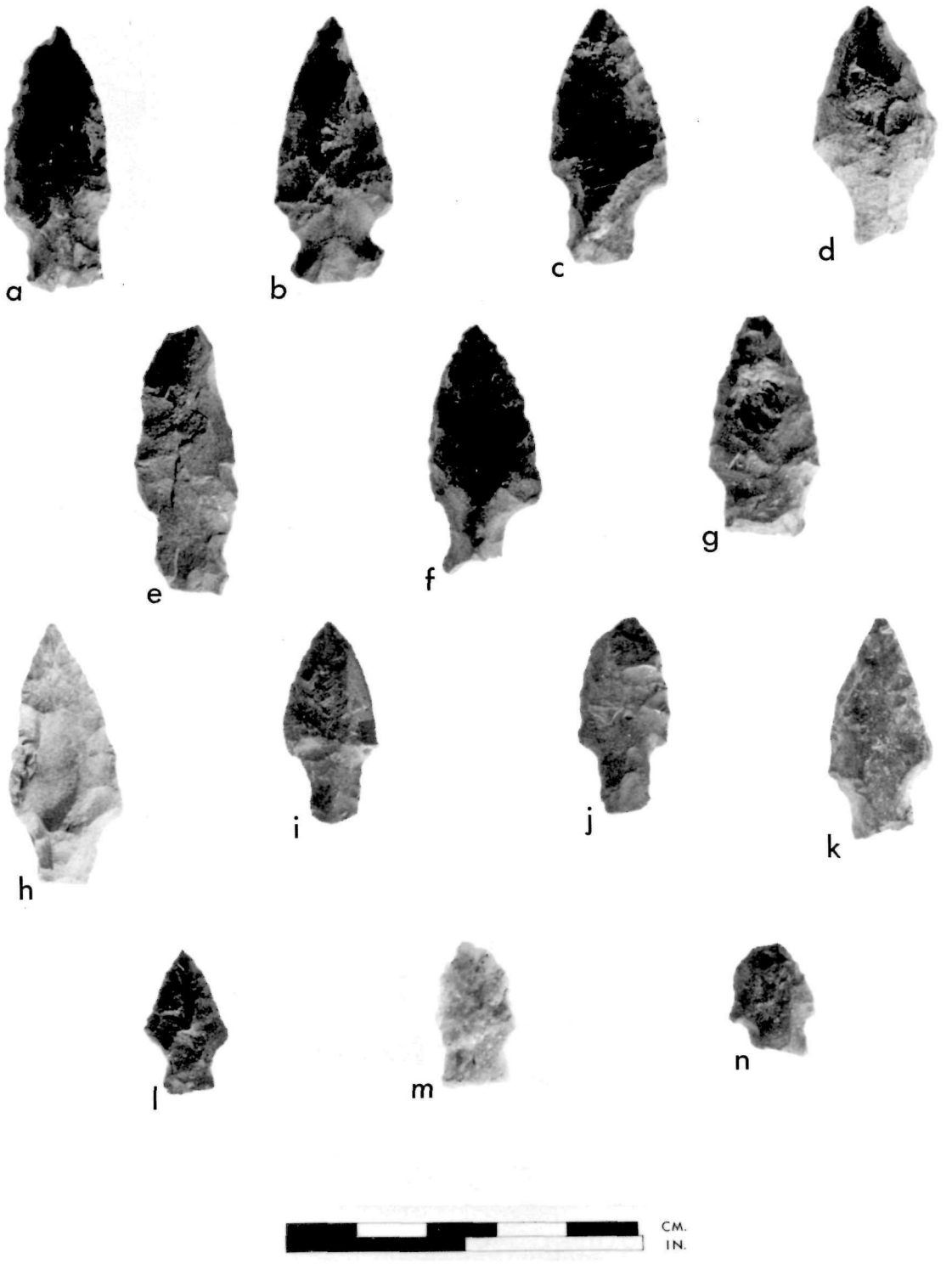
12 Unidentified ground stone objects: a-g, pointed slate objects; h-k, pointed sandstone objects; l, possible bead fragment; m, flat shale object, fragmentary, and n-r, slate rods. (Photo by J. Jolin.)



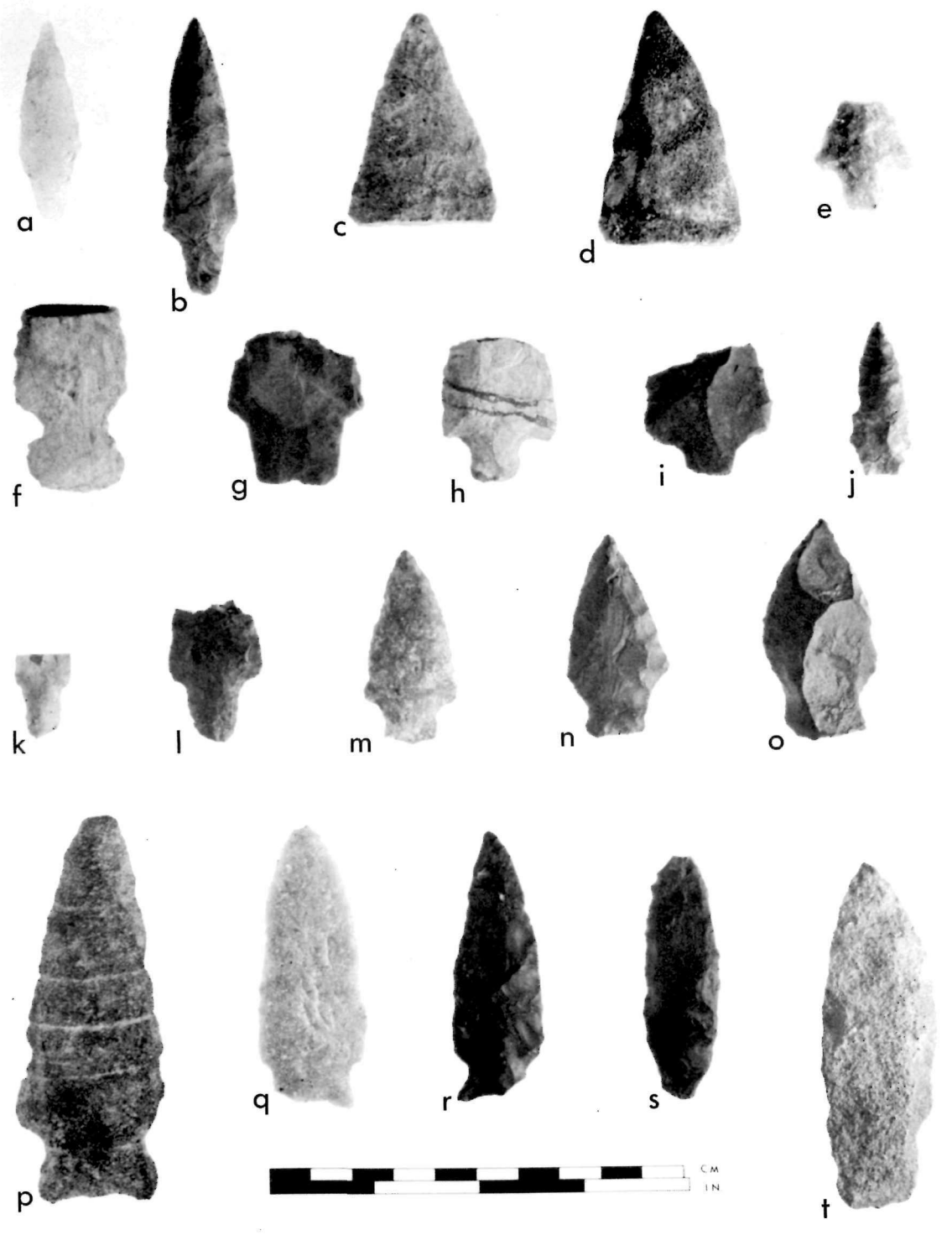
13 Abrasive stones: a, c-k; possible pendant: b. (Photo by J. Jolin.)



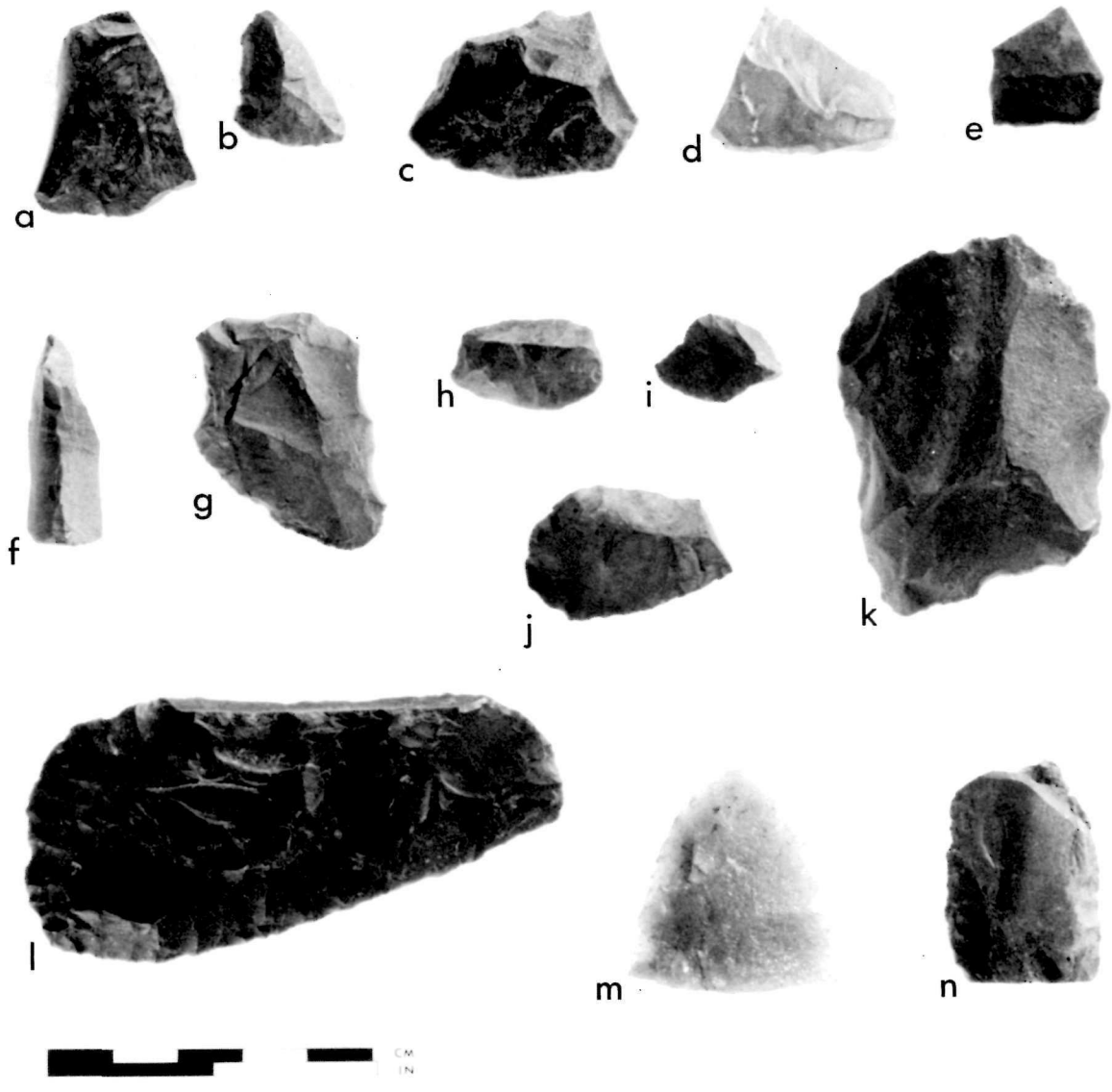
14 Side-notched points: a-g, i, j, Brewerton side-notched points; h, k, possible Brewerton side-notched points; l, m, Brewerton eared-notched points, and n, o, Otter Creek points. (Photo by J. Jolin.)



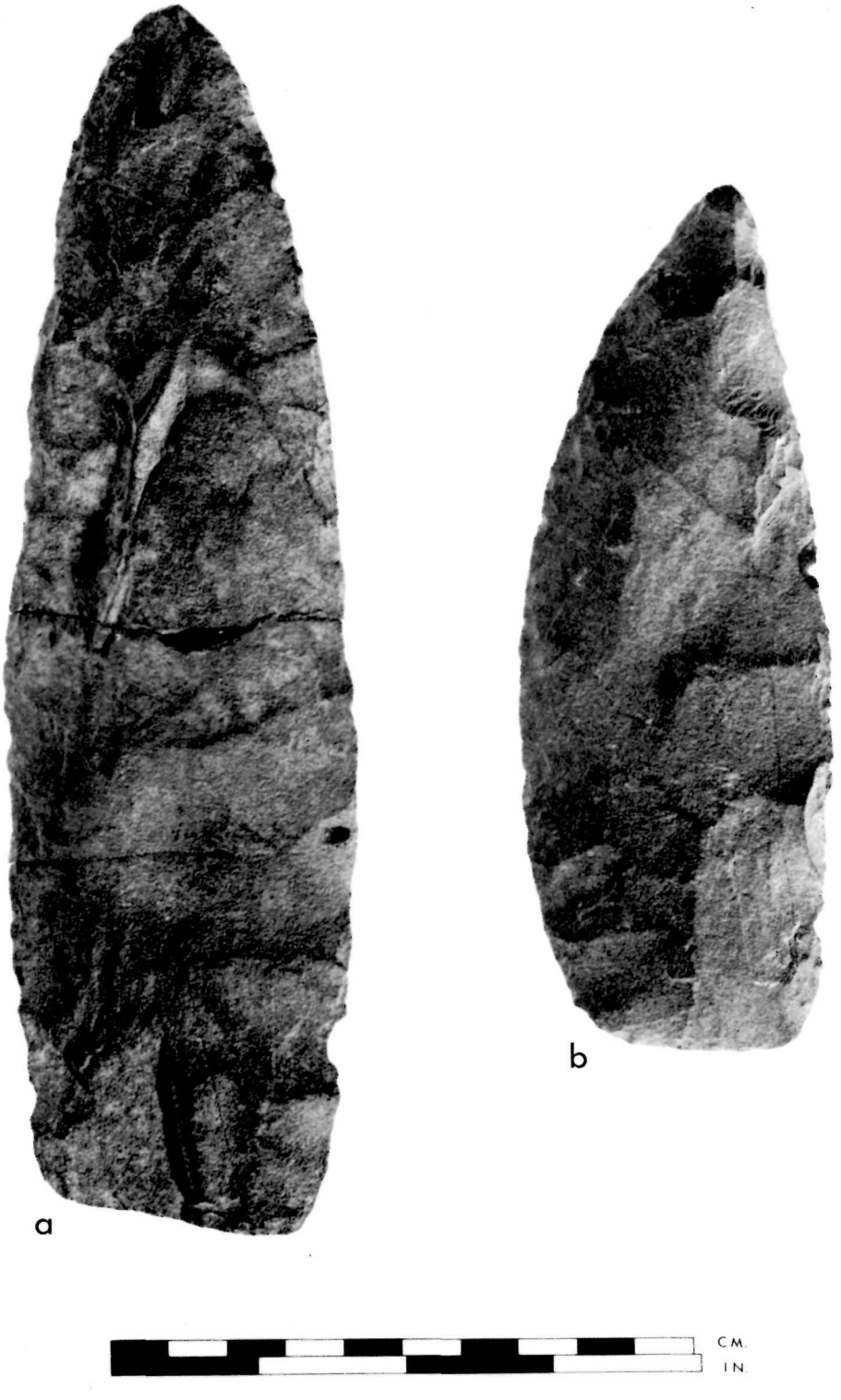
15 Narrow stemmed points: a-d, f-k, Lamoka points; e, possible Lamoka point preform, and l-n, small stemmed points. (Photo by J. Jolin.)



16 Miscellaneous untyped chipped points and knives. (Photo by J. Jolin.)

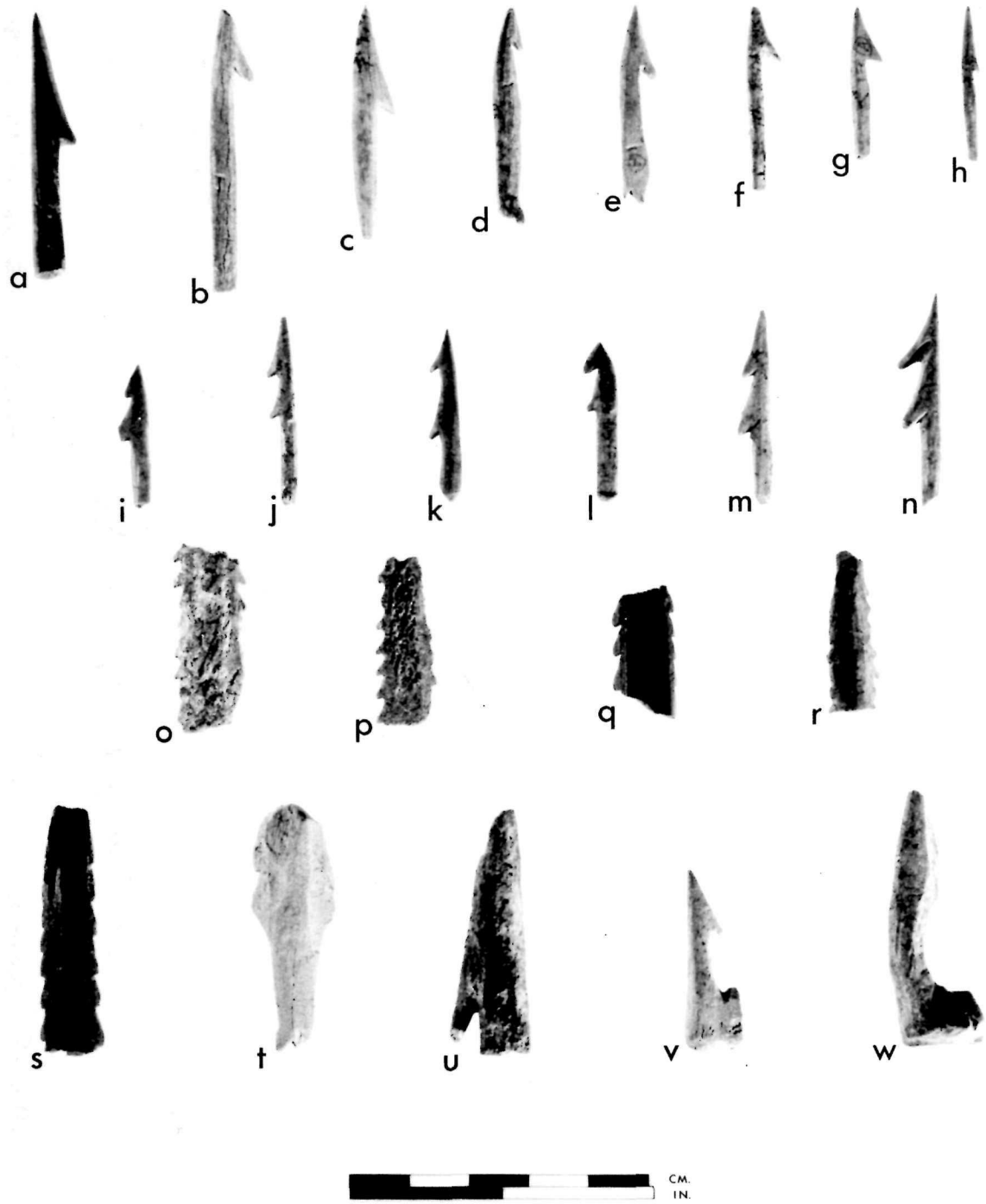


17 Chipped stone scrapers and knives: a, b, end scrapers; c-e, g-i, side scrapers; f, graver; k, thick scraping or chopping tool, and j, l-n, knives. (Photo by J. Jolin.)



18 Large chipped slate bifaces. (Photo by J. Jolin.)

19 Bone points: a-o, awls; p-u, projectile points and/or barbs, and v-z, bipoints. (Photo by J. Jolin.)

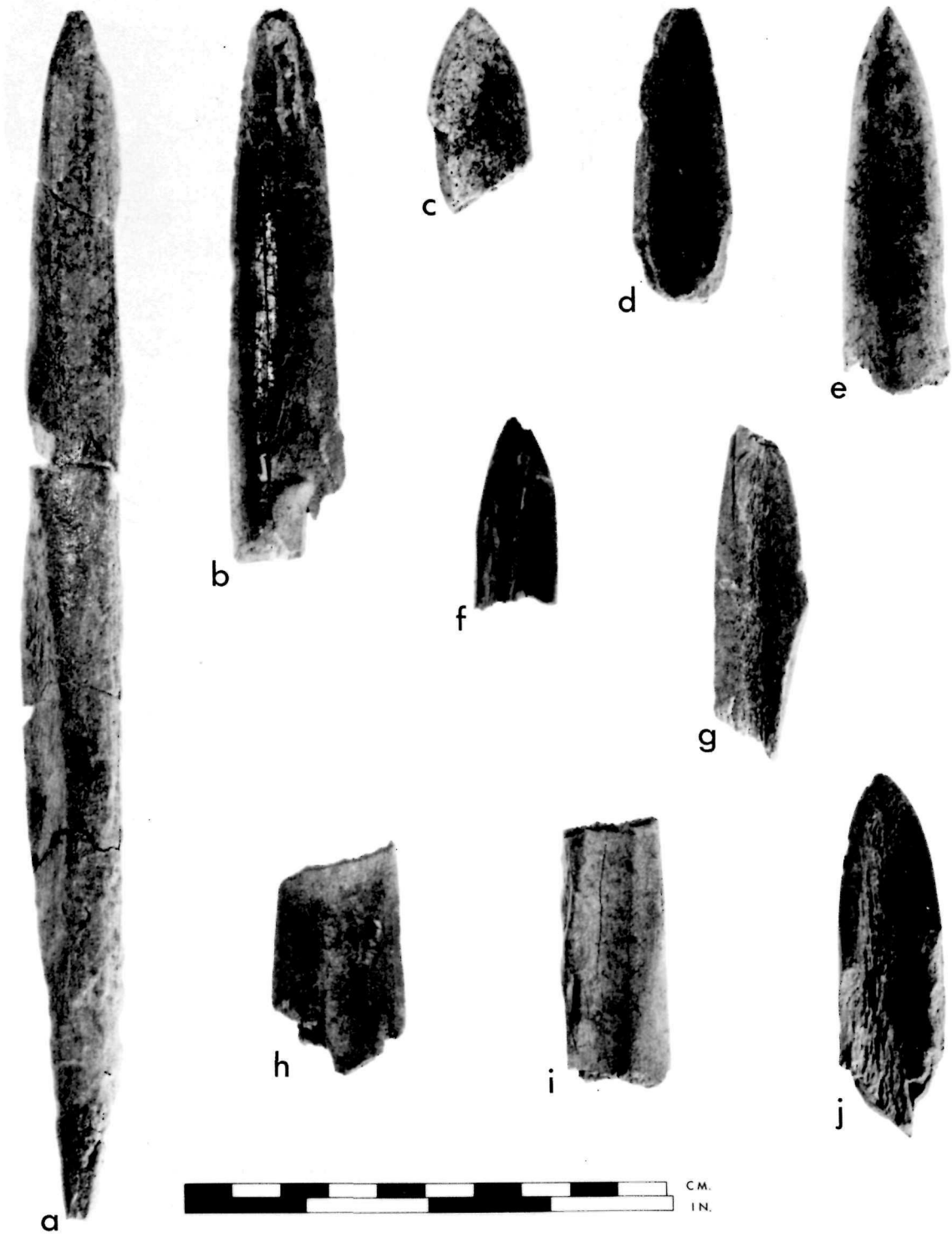


20 Unilaterally single-barbed (a-h) and bibarbed (i-n) bone points; bilaterally multibarbed bone points (o-t), and bone fishhook (v), barbed bone point fragment (u) and possible fishhook preform fragment (w). (Photo by J. Jolin.)

21 Unilaterally multibarbed bone points. (Photo by J. Jolin.)

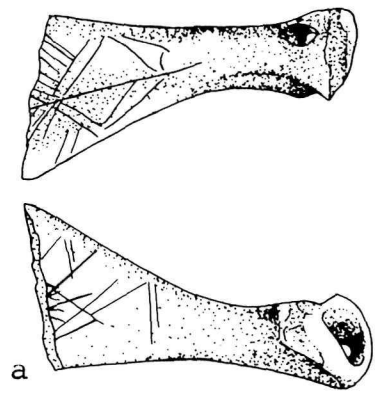
22 Bone projectile point and harpoon heads: a, corner-notched projectile point; b, unilaterally single-barbed harpoon head with line guards, and c, unilaterally single-barbed harpoon head with line hole. (Photo by J. Jolin.)

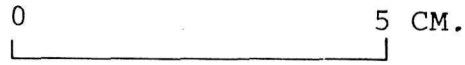
23 Conical toggling antler harpoon heads (a, c) and conical antler projectile points (h-k). b, d-g, fragmentary antler points. (Photo by J. Jolin.)



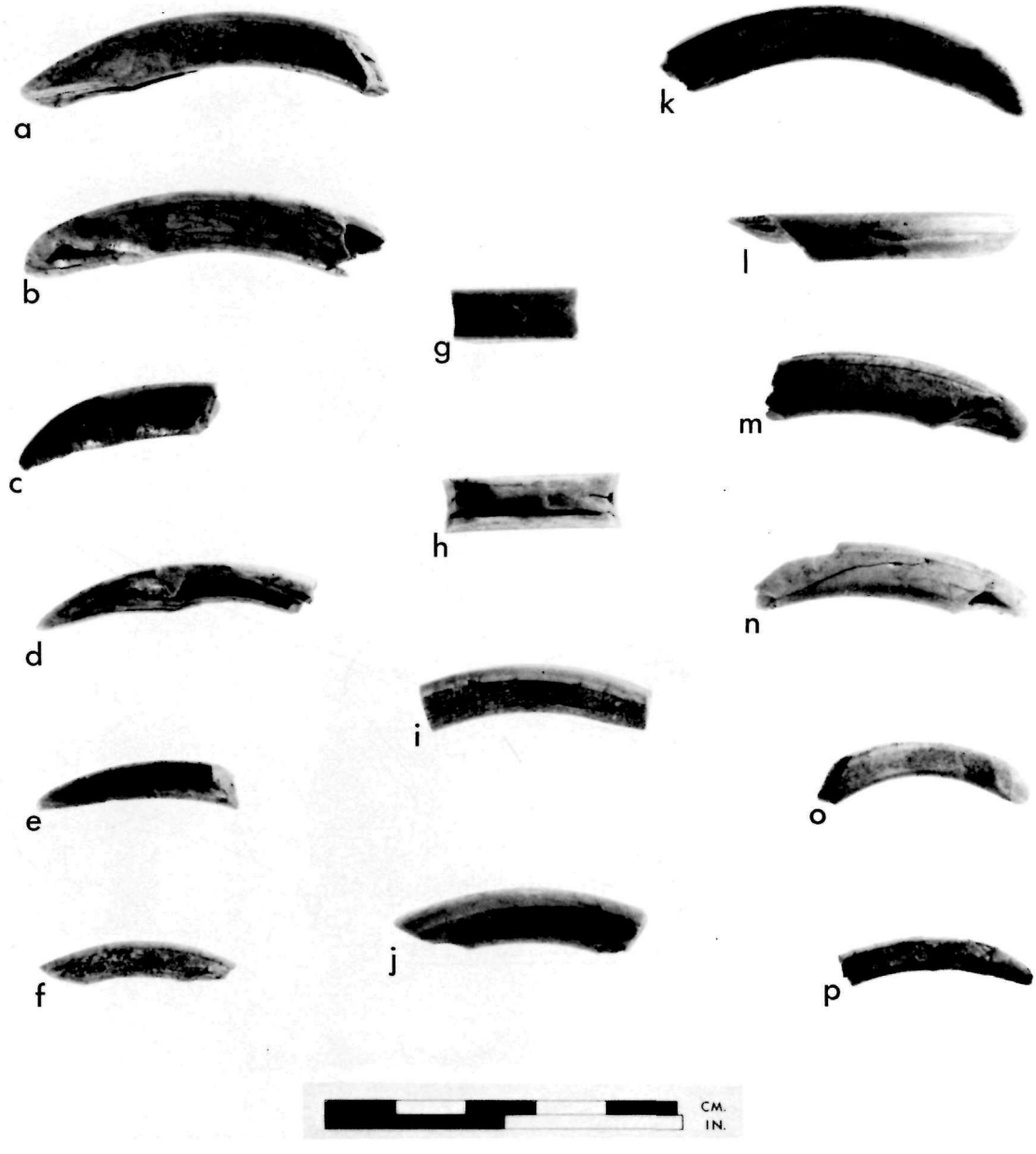
24 Bone daggers, knives and/or fleshers. (Photo by J. Jolin.)

25 Bone (f-h), antler (e) and tooth (a, b) pendants; ground bear teeth from burial 9G49A (c, d). (Photo by J. Jolin.)

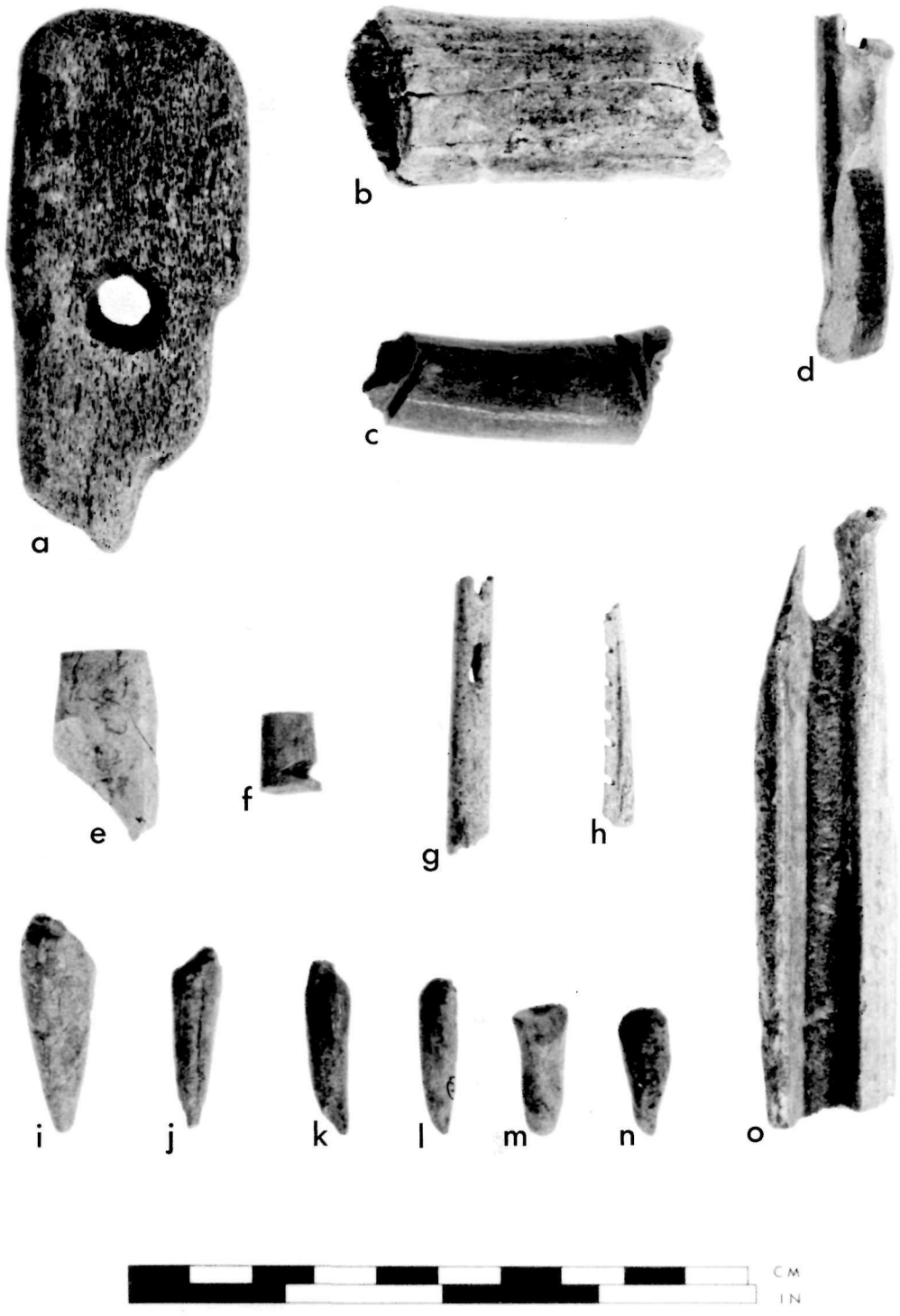




26 Incised bone pendant (a) and unidentified bone point (b). (Drawing by D. Kappler.)

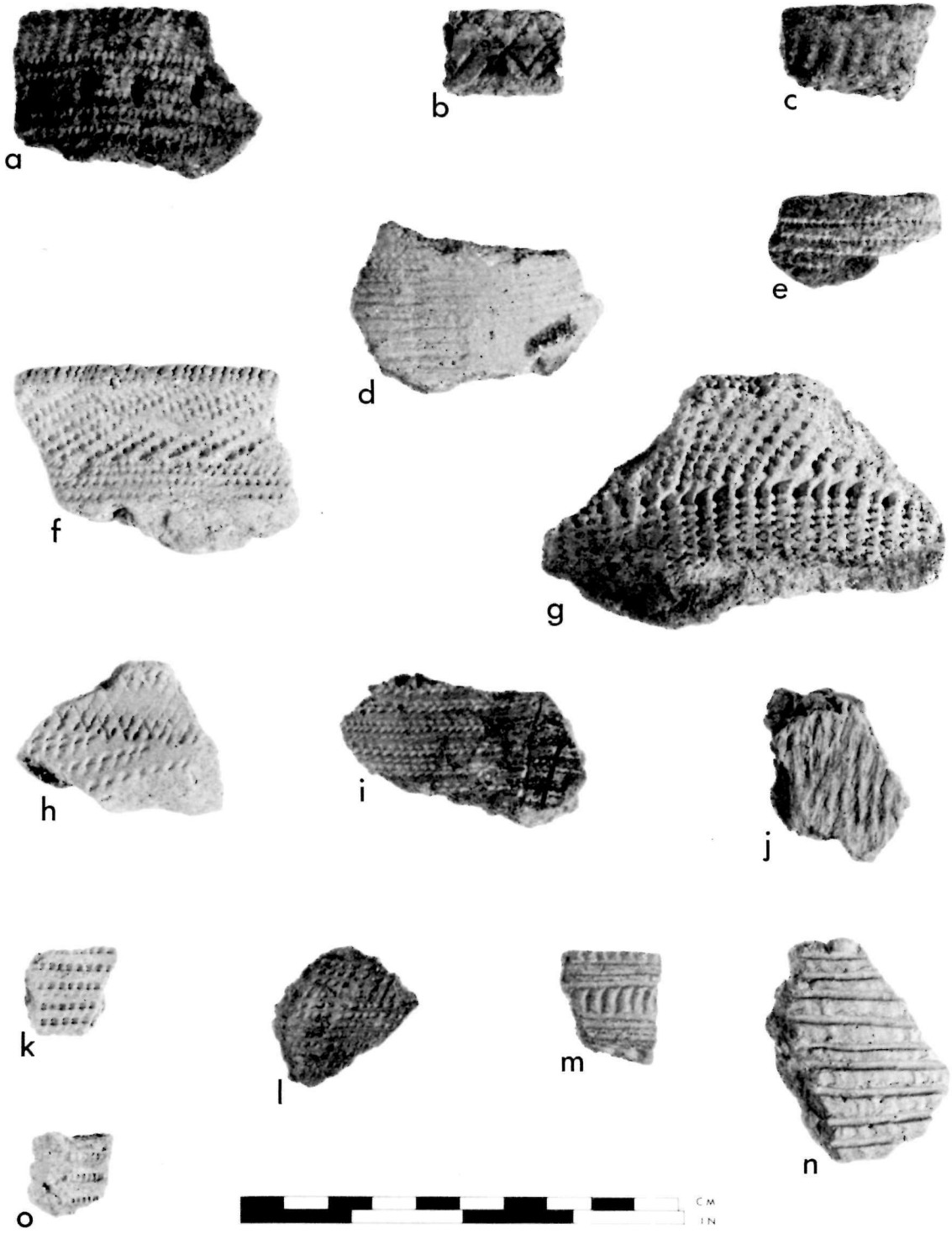


27 Beaver (a-n) and porcupine (o, p) incisor artifacts. (Photo by J. Jolin.)



28 Unidentified bone and antler objects: a, perforated antler object; b, hollow antler shaft, possible celt haft; c, incised antler shaft fragment; d, slotted and perforated bone object; e, ground bone object; f, notched bone object; g, possible whistle or flute fragment; h, notched bone shaft fragment; i-n, notched antler tine tip fragments, and o, bone object. (Photo by J. Jolin.)

29 Copper artifacts: a-d, awls; e, "Ace of Spades" point, and f-j, fishhooks. (Photo by J. Jolin.)



30 Pottery: a-e, cord-wrapped stick; f, h, pseudo scallop shell; i, l, complex dentate; j, cord-malleated; k, o, Vinette dentate, and m, n, Iroquoian. (Photo by J. Jolin.)

31 Pottery rim profiles (measurements are approx. vessel mouth diameter): a, faint castellations, origin unidentified, 22 cm.; b, pseudo scallop shell, 24 cm.- 26 cm.; c, pseudo scallop shell, 42 cm.; d, pseudo scallop shell, 28 cm.; e, Vinette dentate, 16 cm.; f, cord-wrapped stick, undetermined diameter; g, plain, 12 cm.; h, cord-wrapped stick, 22 cm.; i, cord-wrapped stick, 20 cm.; j, cord wrapped stick, 22 cm.; k, Vinette dentate, undetermined diameter, and l, incised, Iroquoian, 12 cm. (Drawing by D. Kappler.)

Analyses of Two Prehistoric Copper Artifacts from the Cloverleaf Bastion of the Fort at Coteau-du-Lac, Quebec

by A. Couture and J.O. Edwards

Abstract

Twenty-three prehistoric copper artifacts were recovered from the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there by the National Historic Parks and Sites Branch in 1965, 1966 and 1968. Two of the artifacts were examined at the Physical Metallurgy Research Laboratories, Canada Centre for Mineral and Energy Technology, Department of Energy, Mines and Resources. It was determined that both artifacts were probably formed from native copper that may have come from deposits in northern Michigan. Techniques possibly used to form the artifacts are suggested, including grinding, cold hammering, cold hammering alternating with applications of heat, and hot working.

Submitted for publication 1973 by A. Couture and J.O. Edwards, Physical Metallurgy Research Laboratories, Department of Energy, Mines and Resources, Ottawa.

Abrégé

Au cours des fouilles entreprises en 1965, 1966 et 1968 par la Direction des lieux et parcs historiques nationaux, ministère des Affaires indiennes et du Nord, vingt-trois artefacts préhistoriques en cuivre étaient retrouvés dans la bastion en trèfle du fort à Coteau-du-Lac (Québec). Deux des artefacts, un hameçon et une pointe de l'engin, furent examinés à la Laboratoires de la métallurgie physique, Centre canadien de la technologie des minéraux et de l'énergie, ministère de l'Energie, des mines et ressources.

Les deux artefacts ont probablement été fabriqués avec du cuivre local, provenant peut-être des gisements du nord du Michigan. Pour les façonner, on a probablement utilisé l'une des quatre techniques ci-après, mais il est difficile de déterminer laquelle sans examen plus détaillé qui risque d'endommager les artefacts. Voici donc les quatre techniques envisagées: l'émoulage, qui aurait plutôt servi à façonner la pointe de l'engin au lieu de l'hameçon; le martelage à froid avec ou sans émoulage; le battage à froid en alternance avec l'application de chaleur, technique plus avancée, ou le travail à chaud.

Introduction

Twenty-three prehistoric copper artifacts were found within the limits of the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there in 1965, 1966 and 1968 directed by W.J. Folan, then of the National Historic Parks and Sites Branch, Department of Indian and Northern Affairs. The cloverleaf bastion was excavated under Folan's direction by Roger Marois in 1965 and 1966 and by Richard Lueger in 1968. Two of the copper artifacts, a fishhook (9G45C69-16) and a projectile point (9G51A5-3), were sent to J.O. Edwards of the Physical Metallurgy Research Laboratories, Canada Centre for Mineral and Energy Technology, Department of Energy, Mines and Resources. Information was requested concerning the origin of the metal used to form the artifacts and the technique by which the artifacts were produced.

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Results of the Analyses

Metallographic Examination

To prepare the artifacts for analysis, they were mounted in "Jet" acrylic (soluble in acetone) in such a way that only a small area would be exposed and polished. This was done to avoid damaging the artifacts unnecessarily because they were destined for museum display.

Examination of the artifacts revealed that the microstructures of the fishhook and the projectile point are essentially similar in both the "as-polished" and etched conditions. In the "as-polished" condition it can be seen, using unfiltred incident light, that the samples are covered with a layer of cuprous oxide which appears light blue under the microscope. However, no oxide or other particles could be seen in the underlying material, even at relatively high magnifications.

In the etched condition the grain boundaries are seen as sharp lines and numerous annealing twins (straight and often parallel lines across a grain) can be observed. The grain size of the fishhook is 0.05 mm. and that of the projectile point is 0.09 mm. to 0.2 mm. Their microstructures are similar to that of a triangular piece of copper from the Strathaven Indian Museum of Anten Mills, Ontario (Couture and Edwards 1964: 200, 207).

Hardness

The diamond pyramid hardness (100-g load) of the fishhook is

61 and that of the projectile point is 58. These, when converted to the Rockwell F hardness scale, give values of 60 to 65 which, according to ASTM Specification B152-71a, correspond to the light cold-rolled temper or to the upper part of the soft-anneal temper with a maximum hardness of 65.

X-Ray Fluorescence Analyses

The two artifacts were analysed by X-ray fluorescence by the Canada Centre for Mineral and Energy Technology spectrographic laboratory. Both the fishhook and the projectile point were found to be made of essentially pure copper, the projectile point containing traces of silver.

Discussion and Conclusions

Results of the X-ray fluorescence analyses indicated that both the fishhook and the projectile point were made from essentially pure copper and metallographic examination showed that the metal contains no internal copper oxide particles. This combination suggests that, unless made by very recent methods, the metal has not been melted. Therefore, it is suggested that the artifacts were made from native copper. This is supported by a small amount of silver, a metal commonly found in native copper, noted in the projectile point.

Native copper appears to be fairly widely distributed in Canada although not in large amounts in the Coteau-du-Lac area (Traill 1970: 163-6). To what extent eastern Canadian native copper was worked by the Indians is not known, but the massive deposits in northern Michigan were extensively utilized. As Coteau-du-Lac is on a direct water route to northern Michigan, it seems not unlikely that trade in what were then considered to be valuable items (native copper or worked copper objects) should have reached Coteau-du-Lac. A piece of native copper similar to the Coteau-du-Lac specimens came from Anten Mills, Ontario, close to Lake Erie (Couture and Edwards 1964: 207). It would seem, therefore, that both the Ontario and Quebec pieces could have originally come from Michigan although this cannot be established.

The presence of silver in the copper does not facilitate identification of the source of native copper.

Native copper is found in upper Michigan in a variety of sizes and shapes from small nuggets to masses of several hundreds of tons and while many of these do contain silver, this is probably not unique. Thus relatively small fragments coming from the same general area may or may not contain silver.

The two artifacts from Coteau-du-Lac were probably formed by one of four different techniques; however, which of the techniques is the most likely cannot be established with a reasonable degree of assurance without considerably more detailed examination. As noted, only a small area of each sample was examined so that the size and shape of the objects were not modified. Study of sections through the fishhook and the projectile point might have been more informative, but would have resulted in extensive damage to the artifacts.

One technique is more probable for forming the projectile point than for forming the fishhook although they both could have been produced by this method: a piece of native copper of roughly the right size and shape could have been ground on a stone to final size. This process would have left no trace of deformation and the microstructure of the copper would, of course, be that of as-found native copper which is essentially similar to what was seen in other samples (Couture and Edwards 1964).

Alternatively, the pieces of native copper could have been cold hammered with or without grinding in which case principally the edges and tips would be expected to show signs of severe deformation. Although a more extensive metallographic examination could not be done for the reasons mentioned above, there was no sign of extensive deformation in the examined sections of both artifacts.

The third possible technique of formation is even more sophisticated and therefore requires considerably more

knowledge than those described above. Nevertheless, it could very well have been used by Indians after European contact if not earlier. It involves alternately cold hammering lumps of copper (which hardens the material) and applying heat to the copper (which softens the material) and in this way the copper is reduced to a final flat or wire-like shape.

Alternatively, hot working would give the same result and the same microstructure which is essentially that of fully recrystallized (annealed) material. The hardness of the artifacts suggests that, after the last application of heat, they were slightly deformed by hammering, bending or straightening, but not enough to alter their microstructures.

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A Catalogue of Canadian Minerals. Geological Survey of Canada, Department of Energy, Mines and Resources, Ottawa. Geological Survey of Canada, Paper 69-45.

Identification of Representative Prehistoric Stone Artifacts and Samples of Unworked Stone from the Cloverleaf Bastion of the Fort at Coteau-du-Lac, Quebec

by D.E. Lawrence

Abstract

Fourteen representative prehistoric stone artifacts and samples of unworked stone were recovered from the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there in 1965, 1966 and 1968 under the direction of W.J. Folan, then of the National Historic Parks and Sites Branch, Department of Indian and Northern Affairs. The objects were examined by D.E. Lawrence, then of the Geological Survey of Canada, Department of Energy, Mines and Resources. Petrographic identification of all but one object was possible, permitting the conclusion that the stone material represented in the collection could have come from within ten miles of the site.

Submitted for publication 1973, by D.E. Lawrence, Water, Lands, Forests and Environment Branch, Department of Indian and Northern Affairs, Ottawa.

Abrégé

Au cours des fouilles archéologiques effectuées au fort de Coteau-du-Lac, au Québec, en 1965, 1966 et 1968, sous la direction de W.J. Folan, alors membre de la Direction des lieux et des parcs historiques nationaux, ministère des Affaires indiennes et du Nord, on a mis au jour quatorze artefacts de pierre préhistorique et échantillons de pierre non travaillée dans le bastion en forme de trèfle. Les objets furent soumis à l'examen de D.E. Lawrence, alors membre de la Commission géologique du Canada, ministère de l'Energie, mines et ressources. L'étude pétrographique permit de les identifier tous, sauf un, et de conclure qu'ils auraient pu provenir d'un rayon de dix milles du site.

Introduction

Fourteen representative stone samples, including prehistoric artifacts, a core, a flake and detritus, found within the limits of the cloverleaf bastion at the fort at Coteau-du-Lac, Quebec, were sent to the Geological Survey of Canada, Department of Energy, Mines and Resources, with a request for information concerning the possible petrographic source of the samples. The material had been recovered during archaeological investigations at the fort in 1965, 1966 and 1968 under the direction of W.J. Folan, then of the National Historic Parks and Sites Branch, Department of Indian and Northern Affairs. The cloverleaf bastion was excavated under Folan's direction by Roger Marois in 1965 and 1966 and by Richard Lueger in 1968.

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Results of the Examination

An examination of the stone artifacts and unworked samples made it possible to identify the rock or mineral types of all the material sent to the laboratory with the exception of a possibly worked point (9G47L55-1). Although the point was quite weathered and little culd be detected by visual examination, subsequent X-ray examination indicated both calcite and quartz to be present.

Table 1 lists the petrographic identifications of the stone objects.

Conclusions

Although it is difficult to determine with any degree of certainty or accuracy the origin or geological history of a small individual artifact or rock or mineral fragment, it is possible to state that the types of rocks represented in the collection could have come from within ten miles of Coteau-du-Lac and to suggest their possible source.

The Oxford Formation exposed in the vicinity of Coteau-du-Lac is composed mainly of limestone and dolomite; the adjacent rocks of the March Formation are calcareous sandstones and dolomites. None of the latter rock types are represented in the Coteau-du-Lac collection with the possible exception of what appears to be a worked point (9G47L55-1). The Oxford Formation is known to contain a few dark argillaceous layers and therefore is a possible source of the slate and shale objects.

The silica objects (flint, chert, quartz and jasper) could be from almost any locality because these minerals may be found in small veins or cavities within any geological formation.

The metamorphic rocks (schist, gneiss and quartzite) are probably of Precambrian age. The closest area of Precambrian rocks lies approximately ten miles north of Coteau-du-Lac.

TABLE

Table 1. Petrographic Identification of Representative Prehistoric Artifacts and Samples of Unworked Stone from the Cloverleaf Bastion of the Fort at Coteau-du-Lac, Quebec

Description	Artifact Number	Petrographic Identification	Remarks
Adze	9G7C1-134	amphibole schist	Precambrian
Projectile point	9G44L3-5	quartzite	
Possible abrasive stone	9G44X1-16	shale	
Detritus	9G45A67-1	chert variety flint	
Knife	0G45C65-10	red shale	
Detritus	9G45M316-3	chert variety flint	
Core	9G45N70-1	jasper	
Pebble	9G45S35-3	granite gneiss	Probably glacially transported; nearest source is the Precambrian area to the north

Table 1 continued

Description	Artifact Number	Petrographic Identification	Remarks
Pecked flake	9G45S103-1	slate	
Point, possibly worked	9G47K4-1	vein quartz	
Point fragment, possibly worked	9G47M6-1	shale	
Projectile point fragment, apparently worked	9G48A57-1	phillite	Composition not determined
Point, possibly worked	9G47L55-1	?	X-ray identification indicates calcite and quartz
Detritus	9G45C65-11	chert	

Fish Remains from the Cloverleaf Bastion
of the Fort at Coteau-du-Lac, Quebec
by W.B. Scott

Abstract

A total of 10,348 bony fish remains was recovered from the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there by the National Historic Parks and Sites Branch in 1965, 1966 and 1968. These remains were examined at the Department of Ichthyology and Herpetology of the Royal Ontario Museum and 4,028 were identified to species or species groups, the remainder being non-diagnostic. Eighteen genera and species are identified, most of which are piscivorous. Estimates of the numbers of individual specimens represented at the cloverleaf bastion indicate that channel catfish and redhorse suckers were the most common fishes deposited there.

Submitted for publication 1972, by W.B. Scott, Royal Ontario Museum.

Abrégé

Des ossements de poissons ont été récupérés du bastion tréflé du fort de Coteau-du-Lac (Québec) lors de fouilles archéologiques effectuées à cet endroit en 1965, 1966 et 1968, sous la direction de M. W.J. Folan qui faisait alors partie de la direction des Parcs et des lieux historiques nationaux, ministère des Affaires indiennes et du Nord. Les travaux de mise au jour du bastion tréflé ont été exécutés par MM. Roger Marois en 1965 et 1966 et Richard Lueger en 1968 sous la direction de M. Folan. M. W.B. Scott, du Département d'icthyologie et d'herpétologie du Royal Ontario Museum, s'est chargé de l'analyse des restes de poissons.

Les ossements de poissons découverts dans le bastion tréflé ont été étudiés et identifiés par comparaison directe avec les ossements de la collection de squelettes du Département d'icthyologie et d'herpétologie du Royal Ontario Museum. Au total, 10,348 os ont été examinés et de ce nombre, 4,028 ont été classés comme faisant partie d'espèces ou de groupes d'espèces. Les autres étaient non caractéristiques, étant des os trop brisés ou des vertèbres trop décomposées ou trop usées pour les identifier. Il semble évident que ces derniers ossements n'appartenaient pas à d'autres espèces que celles qui avaient déjà été identifiées à partir des autres ossements.

Dix-huit genres et espèces ont été identifiés. L'étude des nombreux spécimens individuels nous apprend que l'espèce simple la plus représentée est la barbue de rivière

(Ictalurus punctatus). Les suceurs (Moxostoma spp.), dont on a probablement récupéré cinq espèces, étaient également nombreux. L'achigan à petite bouche (Micropterus dolomieui), le crapet de roche (Ambloplites rupestris) et le malachigan (Aplodinotus grunniens) étaient également présents en quantités suffisantes pour supposer que l'on en pêchait souvent. L'absence de restes de laquaiche argentée (Hiodon tergisus) et d'éperlan arc-en-ciel (Osmerus mordax) n'est pas surprenante car leurs os fragiles peuvent ne pas s'être conservés dans un état reconnaissable, mais l'absence du grand corégone (Coregonus clupeaformis), de l'omble de fontaine (Salvelinus fontinalis et de la lotte (Lota lota) est inattendue. En général, les restes de poissons indiquaient un fort pourcentage de poissons prédateurs, à l'exception des esturgeons (Acipenser spp.), des meuniers noirs (Catostomus commersoni), des suceurs et des malachigans.

La plupart des poissons pris auraient été plus vulnérables lors du frai au printemps et au début de l'été, moments où ils auraient pu être harponnés d'une façon ou d'une autre. Nombre d'entre eux pouvaient avoir été pêchés à la ligne et certains, comme le mulet (Semotilus spp.) et le doré (Stizostedion vitreum), pouvaient avoir été pris au filet.

Introduction

Fish remains were recovered from the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there in 1965, 1966 and 1968 under the direction of W.J. Folan, then of the National Historic Parks and Sites Branch, Department of Indian and Northern Affairs. The cloverleaf bastion was excavated under Folan's direction by Roger Marois in 1965 and 1966 and by Richard Lueger in 1968. Analysis of the fish remains was carried out by W.B. Scott of the Department of Ichthyology and Herpetology, Royal Ontario Museum, under contract to the Department of Indian and Northern Affairs. Two graduate students, R.E. Zurbrigg and R.W. Whittam, provided able assistance.

The bony fish remains from the cloverleaf bastion were studied and identified by direct comparison with comparable bones in the skeletal collection of the Department of Ichthyology and Herpetology of the Royal Ontario Museum. A total of 10,348 bones was examined and of this total, 4,028 are identified to species or species groups. The remainder are non-diagnostic, being excessively fractured bones or weathered or worn vertebrae for which specific identification is impractical. It seems clear that these do not represent species not already identified from other bony parts.

A total of 18 genera and species has been identified. In cases where specific identity within a genus would have been difficult to make even had the whole animal been available for examination, identification using bony elements is taken to genus only. The redhorse suckers, genus Moxostoma,

are a good example.

Identifiable bones of a species recovered from the site and the numbers of those bones are noted in the following chapters. The vertebrae are listed last for each species; otherwise, the bones are listed in descending order of the frequency with which they occurred.

Establishing the minimum number of individual fish that must have been present to account for the bones studied is complicated by the number of excessively fractured pieces. When using bones such as hyomandibulars or maxillaries in good condition, there is no problem in determining whether they belong to the left or right side and this is taken into account when estimating numbers. But pairing bones is another matter. Unless there are marked differences in sizes, it is often impossible to pair with any degree of confidence. However, on no occasion does the estimated number of individuals exceed the number of identified left or right bony parts.

The sizes of specimens were estimated by comparing bones from the site with those from fish of known length in the Royal Ontario Museum's collection. Excessively fragmented bones do not permit adequate comparison and in such cases, for example, the sturgeon, estimates of length and weight were not attempted.

Weights were obtained mainly from weight-length data published for the species. Carlander (1969), Handbook of Freshwater Fishery Biology, was used and also Scott and Crossman (1973), Freshwater Fishes of Canada. Caloric values for fish flesh were obtained from Rostlund (1952), Freshwater Fish and Fishing in Native North America.

The common and scientific names employed throughout are those recommended by the American Fisheries Society, Special Publication No. 6, A List of Common and Scientific Names of Fishes from the United States and Canada, third edition, 1970.

Sturgeon (Acipenser spp.)

Seven pieces of sturgeon cranial membrane bone were recovered. These bony remnants represent one or both of the following species: the lake sturgeon, Acipenser fulvescens, or the Atlantic sturgeon, A. oxyrhynchus. The available bony remains do not permit identification to species; however, the Atlantic sturgeon is not known to have penetrated upriver beyond Ile-de-Montréal.

Sturgeon possess only s small amount of bone, restricted to the external covering of the head and the five rows of plates or bony bucklers arranged along the sides and dorsal midline.

The bony remains may represent no more than one sturgeon at the site. Additional evidence of sturgeon remains might have been expected since lake sturgeon and Atlantic sturgeon were reasonably abundant in the Montreal region of the St. Lawrence River until recent times.

There are too few remains to warrant speculation on the methods of capture. Elsewhere, sturgeon were caught by hook, by spearing or in gill nets.

Longnose Gar (Lepisosteus osseus)

Twenty-two pieces of bony elements of Lepisosteus were recovered. The bony elements include: cranial membrane bone fragments, 5; frontal, 3; parasphenoid, 1, and vertebrae, 12. The only species known to occur in the Lake Ontario-St. Lawrence River system is L. osseus and it is therefore assumed that the species involved is L. osseus.

The skeleton of the longnose gar is generally light, but the vertebrae are opisthocoelous, an unique condition among living fishes found only in gars. The hard ganoid scales which cover the whole body are also unique and the rhomboid shape of the scales is characteristic. The absence of scales in the excavated material is noteworthy.

Possibly two specimens are present. The size of the specimens is estimated at 710 mm. (28 in.) total length.

The longnose gar is not usually regarded as a food fish and it seems unlikely that it was used as food in this case.

Longnose gars are difficult to capture except with nets or weirs. They are difficult to hook and the heavy enamelled scales and narrow body make spearing unlikely. They would be most easily captured when spawning in spring in shallow water.

Pikes (Esox spp.)

Twenty-five pieces of nine identifiable bones of the genus Esox were recovered. The bones are: tooth, 5; dentary, 4; palatine, 3; parasphenoid, 3; premaxillary, 2; vomer, 1; quadrate, 1; hyomandibular, 1, and vertebrae, 5.

Four species of Esox are present in the area: northern pike, Esox lucius; muskellunge, E. masquinongy; chain pickerel, E. niger, and redfin pickerel, E. americanus. However, the bones available do not permit positive identification to species.

It is estimated that three specimens are present in the collection, each weighing not more than about three pounds and totalling nine pounds. The relative scarcity of pike bones is rather surprising. The absence of muskellunge (E. masquinongy) implies that this large fish was not available to these early fishermen.

The bones provide no indication of the method of capture or utilization. These fish could have been captured by spearing or with bow and arrow when the fish were spawning in shallow water in spring.

Chubs (Semotilus spp.)

Seven pharyngeal arches were recovered. These pharyngeal arches are readily identifiable to the genus Semotilus, but not to species. Two species may be involved: the creek chub, S. atromaculatus, and the fallfish, S. corporalis.

A minimum of four fish is present. The creek chub grows to a length of approximately 254 mm. (10 in.). The estimated length of the specimens is 254 mm. to 305 mm. (10 in. to 12 in.).

These chubs are not usually regarded as food fishes although the flesh is white and sweet tasting. It is suggested that these small fishes would not be sought directly, but were possibly taken incidentally while other species were being caught.

Suckers (Family Catostomidae)

Thirty pieces of four indentifiable sucker bones were recovered: pharyngeal arch, 3; basioccipital, 1; hyomandibular, 1, and vertebrae, 25.

Identification was only carried to the family Catostomidae level since some bones are small and broken and the remainder are vertebrae. Only two fish are involved. The amounts are small and insignificant in comparison with the large number of Moxostoma bones.

White Suckers (Catostomus commersoni)

Nineteen pieces of nine identifiable bones of white suckers were recovered. The bones include: hyomandibular, 5; Weberian process, 3; opercle, 2; articular, 2; pharyngeal arch, 2; parasphenoid, 2; supraoccipital, 1; pterygiophore, 1, and urohyal, 1.

Few white suckers are involved. The evidence suggests a minimum of three specimens (five hyomandibulars, two per fish). The length of these specimens averages 355 mm. (14 in.). White suckers of this size would weigh about one pound.

Redhorse Suckers (Moxostoma spp.)

Redhorse sucker bones are numerous: 1,920 pieces of 35 identifiable bones were recovered. The bones include: maxillary, 292; dentary, 279; hyomandibular, 256; Weberian process, 176; Weberian vertebrae, 124; cleithrum, 92; opercle, 88; parasphenoid, 82; articular, 71; premaxillary, 63; pharyngeal arch, 60; urohyal, 57; quadrate, 49; coracoid, 39; hyal, 31; metapterygoid, 30; frontal, 26; palatine, 16; basipterygium, 15; vomer, 13; pterygiophore, 9; basisphenoid, 9; rib, 7; supraoccipital, 7; scapula, 5; basihyal, 3; subopercle, 3; ceratohyal, 2; epural, 2; dermethmoid, 2; ethmoid, 2; parietal, 1; pterygoid, 1; supratemporal, 1, and vertebrae, 20.

Identification has been taken only to the genus Moxostoma. There are possibly five species involved: silver redhorse, Moxostoma anisurum; shorthead redhorse, M. macrolepidotum; river redhorse, M. carinatum; greater redhorse, M. valenciennesi, and copper redhorse, M. hubbsi. However, it is probable that the majority of the remains are from two species: the silver redhorse, M. anisurum, and the shorthead redhorse, M. macrolepidotum.

Considering the 292 maxillary elements alone, there must have been a minimum of 146 redhorse suckers (292 maxillaries, two per fish). An estimate of 150 redhorse suckers seems not unreasonable and is probably too low.

The sizes caught are estimated to have ranged in length from 200 mm. (8 in.) to 760 mm. (30 in.) and in weight from 227 g. (0.5 lb.) to 4,000 g. (9 lb.). An average weight is

estimated to have been about 1,130 g. (2.5 lb.). Therefore, the total weight of redhorse suckers represented by these remains is approximately 375 pounds.

The large number of bones suggest that redhorse suckers were readily available and were used frequently. Rostlund (1952) noted that suckers were generally overlooked by those investigating archaeological remains. He implied that they were consumed more frequently than had been suspected. Redhorse suckers are highly regarded as food fish by many people even today although considerable prejudice to them as food still exists. Rostlund gives a caloric value of 500 to 400 calories per pound of flesh for suckers.

The remains do not offer any information regarding the method employed for capturing these suckers, but it seems probable that they were caught during spring spawning movements. All suckers are spring spawners, usually moving into shallow streams to deposit their eggs. Capture could have been made by spears, nets or traps.

Channel Catfish (Ictalurus punctatus)

Channel catfish bones are also numerous: 1,238 pieces of 35 identifiable bones were recovered. The bones are: pectoral spine, 440; dentary, 128; articular, 128; cleithrum, 77; dorsal spine, 64; ceratohyal, 50; quadrate, 31; preopercle, 31; opercle, 25; premaxillary, 25; ethmoid, 20; epihyal, 19; prefrontal, 18; frontal, 18; hyomandibular, 17; coracoid, 12; orbitosphenoid, 12; basisphenoid, 11, urohyal, 11; dermethmoid, 9; basioccipital, 9; pterotic, 9; palatine, 8; parasphenoid, 8; interopercle, 8; subopercle, 7; hypohyal, 6; supraoccipital, 4; posttemporal, 4; interhyal, 3; supratemporal, 1; exoccipital, 1; sphenotic, 1; Weberian process, 1, and vertebrae, 22.

Identification to species was possible because of the large number of diagnostic bones. Pectoral spines are particularly abundant, totalling 440 in the sample and representing a minimum of 220 fish. The channel catfish is, therefore, the most abundant single species represented.

The channel catfish represented in this sample generally range in length from about 180 mm. (7 in.) to about 750 mm. (30 in.). Skeletal remains of at least one specimen suggest a weight approaching 30 pounds. The average length is about 500 mm. (20 in.); the average weight, about 1,312 g. (3 lb.). The minimum total weight of channel catfish flesh represented by the bones is 660 pounds.

Remains of relatively large numbers of channel catfish are not surprising for this species has long been highly regarded for its food value. Rostlund (1952) notes that

"catfish were the most valuable food fishes available to the Indians in the inland region south of the Great Lakes." The food value of catfish flesh is rated at 1,000 calories per pound of flesh, more or less on a par with salmon and eel.

Spawning occurs in the spring. Adults sometimes ascend rivers in search of spawning sites.

The bones provide no indication of the method of capture or utilization of the fish. The fish are destructive of gill netting and are not likely to be taken in daylight seining. They could have been captured in traps set in the rivers in which they spawned. It seems probable, however, that channel catfish were caught by hook and by spearing in shallow water during spawning activities.

Brown Bullhead (Ictalurus nebulosus)

A single bone, an articular, from the brown bullhead was identified. The bones of this species are so characteristic that it is unlikely that any additional pieces of bone were overlooked.

The most likely conclusion is that the species was caught incidentally, possibly while channel catfish were being taken.

American Eel (Anguilla rostrata)

Two hundred and seven pieces of four identifiable bones of the American eel were recovered: cleithrum, 7; dentary, 1; parasphenoid, 1, and vertebrae, 198. The nature of the bones do not permit a close estimate of how many eels were involved. The seven cleithra would suggest a minimum of four eels.

The estimated size of the eels ranges from 600 mm. to 1,000 mm. (23.7 in. to 39.4 in.) in total length with a possible average of about 750 mm. (29.5 in.) and a weight of 1,130 g. (2.5 lb.).

There seems little reason to doubt that eels were caught during their seaward migration down the St. Lawrence River in summer and autumn. During downstream migrations eels will leave the water, especially at night, when confronted with a barrier and will move through marshy ground or wet grass to circumnavigate obstructions. They would be most vulnerable to capture at such times. They could also have been caught by hook.

Rock Bass (Ambloplites rupestris)

One hundred and three pieces of 20 identifiable bones of rock bass were recovered. The bones are: cleithrum, 42; quadrate, 11; preopercle, 9; articular, 7; vomer, 6; dentary, 5; ceratohyal, 4; postcleithrum, 3; supracleithrum, 3; interopercle, 2; premaxillary, 2; basipterygiophore (pelvic), 1; epihyal, 1; hyomandibular, 1; maxillary, 1; opercle, 1; subopercle, 1; supraoccipital, 1; palatine, 1, and pterygiophore (anal), 1.

The large number of bones indicates a minimum of 25 specimens. The sizes of the bones indicate that the specimens range in size from 114 mm. (4.5 in.) to 254 mm. (10 in.). The average size is estimated to have been about 155 mm. (6.1 in.) with an average weight of approximately 227 g. (0.5 lb.).

Although rock bass is not renowned for its table qualities, it is a good food fish and the flesh is sweet. It is a small fish, seldom exceeding a pound in weight, but is fleshy for its size. The relatively large number of bones suggested that it was common and considered desirable.

Spawning occurs in shallow, inshore waters in spring and early summer when the species is possibly most vulnerable to capture. It could have been captured by spearing or by hook.

Pumpkinseed Sunfish (Lepomis gibbosus)

Four pieces of three identifiable bones of pumpkinseed sunfish were recovered: cleithrum, 2; articular, 1, and preopercle, 1.

These sparse remains of the ubiquitous common sunfish suggest two specimens about 127 mm. (5 in.) long.

The sunfish was possibly caught incidentally while other species were being taken.

Smallmouth Bass (Micropterus dolomieui)

Three hundred and twenty-five pieces of 19 identifiable bones of smallmouth bass were recovered. The bones include: cleithrum, 62; dentary 48; parasphenoid, 42; quadrate, 41; articular, 33; preopercle, 18; opercle, 18; frontal, 14; ceratohyal, 10; premaxillary, 8; maxillary, 7; interopercle, 4; vomer, 4; postcleithrum, 3; supracleithrum, 3; urohyal, 3; hyomandibular, 2; supraoccipital, 1, and vertebrae, 4.

The large number of bones indicate a mimimum of 35 specimens, probably more. Specimens range in size from about 180 mm. (7.1 in.) to 381 mm. (15 in.). The average length is approximately 254 mm. (10 in.), such a size usually weighing about 318 g. (0.75 lb.).

The large number of bones suggest that smallmouth bass were common and were considered desirable, as is noted also for rock bass. This is a good food fish although not everyone likes to eat it.

The smallmouth bass resembles the rock bass in many aspects of its biology. Both build nests on the bottom, in relatively shallow water, in spring and early summer. Smallmouth bass thrive in clear, rocky lakes and rivers. The St. Lawrence River at Coteau-du-Lac was apparently a suitable habitat for the species. Even today the smallmouth bass is particularly well established in the Thousand Islands region of the St. Lawrence River.

Male smallmouth bass would be most vulnerable to spearing when guarding their nests, often located in less than ten feet of water. However, the small size of some of

the fish (7.1 in.) suggests other methods were used, such as angling, since spawning males are usually larger than this.

Largemouth Bass (Micropterus salmoides)

Two pieces of two identifiable bones of largemouth bass were recovered: one frontal and one cleithrum.

The identity of these bones is not in doubt. A maximum of two specimens is involved and their lengths are estimated to be 175 mm. to 200 mm. (6.9 in. to 7.9 in.).

The evidence suggests that few largemouth bass were caught in this region, which seems to have been dominated by smallmouth bass and rock bass. Largemouth bass prefer a weedy, still-water habitat which, presumably, was not the dominant habitat at the Coteau-du-Lac site.

The specimens could have been caught by spearing or by angling.

Black Crappie (*Pomoxis nigromaculatus*)

Black crappie was represented by a single bone, a ceratohyal.

This single piece of evidence suggests the species was caught incidentally while other species were being taken.

Yellow Perch (Perca flavescens)

Nine pieces of six identifiable bones of the yellow perch were recovered. The bones are: articular, 3; cleithrum, 2; dentary, 1; premaxillary, 1; preopercle, 1, and quadrate, 1.

The skeletal remains suggest the presence of no more than two fish with a combined weight of about one pound.

The yellow perch is a widely distributed, but relatively small species, usually weighing less than one pound. It is highly regarded as a food fish.

The meagre evidence of yellow perch suggests it was caught incidentally while other species were being taken.

Walleye (Stizostedion spp.)

Thirty-five pieces of 13 identifiable walleye bones were recovered: dentary, 9; ceratohyal, 5; articular, 5; cleithrum, 3; parasphenoid, 3; premaxillary, 2; vomer, 2; hyomandibular, 1; maxillary, 1; palatine, 1; preopercle, 1; prootic, 1, and quadrate, 1.

Two possible species of walleye are involved, the yellow walleye, Stizostedion vitreum, and the sauger, S. canadense. The yellow walleye is larger, more common and more widely distributed than the sauger, but both species appear to be represented although definite separation is impossible.

The total number of individuals was difficult to assess, but is estimated to have been a minimum of five. Sizes of the bones suggest that the fish range from about two to five pounds. Assuming an average weight of 3.5 pounds, the total weight of flesh involved possibly approximated 17.5 pounds. The caloric value of walleye flesh is said to average 350 calories per pound (Rostlund 1952).

Yellow walleyes are most susceptible to capture during the spring spawning runs when they enter relatively shallow rocky streams and can then be easily speared or gaffed. Since they would be caught in numbers in a matter of two or three weeks, it might be expected that large numbers of walleye bones would be found together, but this apparently was not the case. The species could also have been captured by angling.

Freshwater Drum (Aplodinotus grunniens)

One hundred and twenty-eight pieces of 12 identifiable bones of the freshwater drum were recovered. The bones are: pharyngeal arch, 36; anal spine, 29; dorsal spine, 22; pterygiophore, 14; premaxillary, 11; pelvic spine, 4; quadrate, 3; palatine, 2; dentary, 2; articular, 1; vomer, 1, and vertebrae, 3.

The skeleton of the freshwater drum has many characteristic bones, especially the pharyngeal arches, the fin spines and associated pterygiophores. The absence of the large and characteristic otolith is somewhat surprising. Otoliths are the calcareous earstones located, one on each side, posteriorly in the skull. Otoliths of freshwater drum are frequently found in American Indian middens and were the object of a special study by Witt (1960).

It is difficult, if not impossible, to state exactly how many specimens were represented by the available bones, but it is estimated that there are at least 30 to 35 specimens, ranging in total length from 440 mm. to 520 mm., (approximately 17.3 in. to 20.5 in.). The weights corresponding to these lengths would be 680 g. to 2,041 g. (1.5 lb. to 5.5 lb.), using figures provided by Edsall (1967). The larger sizes predominate in the sample at the ratio of about 3:1. Thus, it could be calculated that the total weight of fish represented by these bones could have been approximately 120 pounds (24 fish at 5.5 pounds, 8 fish at 1.5 pounds).

The freshwater drum has never been highly esteemed as a

food fish by North American Indians. Rostlund (1952) referred to it as freshwater sheepshead. It is a fat fish with an average caloric value per pound of 520 calories.

The bones provide no indication of how the fish were caught or utilized. They could have been caught by angling, especially with a hook set on the river bottom. The species is not easily observed in nature and its capture by spearing is difficult to envisage.

Discussion

Cuerrier, Fry and Préfontaine (1946) published an annotated list of the fishes of the St. Lawrence River covering the region from Lac Saint-François to Lac Saint-Pierre. Our interest centres on Lac Saint-François since the fort at Coteau-du-Lac was located on the northern shore at the downstream end of this lake. Of the approximately 26 species listed by Cuerrier, Fry and Préfontaine that could reasonably have been expected to have been used for food, 18 were found among the bony remains recovered from the cloverleaf bastion at the fort. The evidence suggests that some of these were common, such as the channel catfish, redhorse sucker, smallmouth bass, rock bass and freshwater drum.

The absence of bones of Atlantic salmon (Salmo salar), the American shad (Alosa sapidissima) and striped bass (Morone saxatilis) is not surprising since we have no evidence that these species penetrated up the St. Lawrence River beyond its confluence with the Ottawa River. Some species, such as the mooneye (Hiodon tergisus) and the rainbow smelt (Osmerus mordax), have fragile bones which might not have survived in a recognizable state. The lake whitefish (Coregonus clupeaformis) and the brook trout (Salvelinus fontinalis) may have been rare in the vicinity of Coteau-du-Lac, as they were in 1946, but the complete absence of these commonly used food fishes is surprising. The burbot (Lota lota) is the last of the expected species. Although the burbot was probably common in the area during the deposition of the remains analysed, as it was in the

1940s, not a single bone of this species was noted. Since the species commonly grows to sizes in excess of five pounds and has a well-ossified skull, burbot bones would not have been overlooked. Perhaps it was not highly regarded as food.

Identifiable species recovered from the cloverleaf bastion and an estimate of the number of individual fish present are listed in Table 1. The numbers of each species shown are the absolute minimum numbers of individuals that must have been present to account for the bones studied.

All the species listed spawn in the spring and early summer with the exception of the eel. All these spring-spawning species, except the freshwater drum, whose reproductive habits are not well known, are most vulnerable to capture at some phase of their spawning activity. The chubs build nest of stones in shallow waters of streams; the suckers move into shallow waters of streams, usually in large numbers, and remain in pools, resting quietly during the day; the catfishes spawn in shallow water and guard the eggs and newly-hatched young for many days; the rock bass, pumpkinseed sunfish, crappies, and largemouth and smallmouth basses build nests on bottom in shallow water and guard both nests and newly-hatched fry. The yellow perch spawns in spring, but usually offshore and is not as accessible to man as the other species mentioned. The yellow walleye, however, enters streams in the early spring to spawn and could easily be speared or dip netted at this time.

In summary, then, most of the fishes caught would have been most vulnerable during spring and early summer when they could have been speared in some manner. Many could have been hooked and some, such as the chubs and yellow walleye, may have been caught by dip net.

In general, the fish remains in the sample indicate a high percentage of piscivorous or predatory fishes.

Exceptions are the bottom-feeding sturgeons, white suckers, redhorse suckers and the freshwater drum.

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TABLE

Table 1. Identifiable Species and Estimated Number of Fish Recovered from the Cloverleaf Bastion of the Fort at Coteau-du-Lac, Quebec

Families and Species	Estimate of Numbers
Acipenseridae - sturgeons	
Acipenser spp. - sturgeons	1(?)
Lepisosteidae - gars	
Lepisosteus osseus - longnose gar	2(?)
Esocidae - pikes	
Esox spp. - pikes	3
Cyprinidae - minnows	
Semotilus spp. - chubs	4
Catostomidae - suckers	2
Catostomus commersoni - white sucker	3
Moxostoma spp. - redhorse suckers	146
Ictaluridae - freshwater catfish	
Ictalurus punctatus - channel catfish	220
Ictalurus nebulosus - brown bullhead	1
Anguillidae - freshwater eels	
Anguilla rostrata - American eel	4
Centrarchidae - sunfishes	
Ambloplites rupestris - rock bass	25
Lepomis gibbosus - pumpkinseed sunfish	2
Micropterus dolomieui - smallmouth bass	35
Micropterus salmoides - largemouth bass	2
Pomoxis nigromaculatus - black crappie	1

Table 1 continued

Families and Species	Estimate of Numbers
Percidae - perches	
Perca flavescens - yellow perch	2
Stizostedion vitreum - yellow walleye	5
Sciaenidae - drums	
Aplodinotus grunniens - freshwater drum	35

The Human Osteological Material from the Cloverleaf Bastion of the Fort at Coteau-du-Lac, Quebec

by J. Edson Way

Abstract

Human osteological material recovered from the cloverleaf bastion of the fort at Coteau-du-Lac, Quebec, during archaeological investigations there by the National Historic Parks and Sites Branch was analysed in the physical anthropology laboratory of the University of Toronto under contract to the Department of Indian and Northern Affairs.

The generally well-preserved skeletal material, which represents aboriginal remains rather than Christian burials, was very fragmentary due to the extensive historic disturbances at the site. Only two relatively complete individual burials were present. Metric data were nearly impossible to obtain and the sample size was small, limiting the value of the statistical data compiled.

Nevertheless, in spite of its condition and context, the skeletal material has been described and some demographic information obtained. Further, suggestions have been made on the temporal and ethnic relationships of the Coteau-du-Lac material with remains from the Serpent Mounds site and Fairty ossuary in Ontario and the Robinson site in Wisconsin.

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Abrégé

Les os humains découverts dans le bastion tréflé du fort de Coteau-du-Lac, au cours des fouilles archéologiques entreprises par la Direction des lieux et des parcs historiques nationaux, ont fait l'objet d'une analyse au laboratoire d'anthropologie physique de l'université de Toronto, en vertu d'un marché avec le ministère des Affaires indiennes et du Nord.

Ces restes, généralement bien conservés, sont d'origine aborigène plutôt qu'européenne et sont très fragmentaires suite aux nombreux bouleversements qu'a connu le fort. Les spécialistes n'ont réussi à reconstituer plus ou moins complètement que deux squelettes. Il a été pratiquement impossible d'obtenir des données métriques. De plus l'échantillon était petit, limitant ainsi la valeur des données statistiques.

Malgré leur condition et leur situation géographique, les restes ont tout de même révélé certaines informations. D'après une évaluation prudente le nombre d'individus serait de 14, mais il est possible qu'il y en ait eu 20. L'âge des décédés s'étend de moins de 2 ans à 41 ans, et il semble que la distribution des sexes soit équilibrée. La seule évaluation dimensionnelle réaliste est celle d'une personne mesurant 170.4 cm (67 pouces). De plus, les os révèlent que ces gens étaient en bonne santé.

L'origine des os découverts à Coteau-du-Lac s'apparente plus à celle de l'ancienne population Woodland de Serpent Mounds qu'à celle de la population Woodland moyenne, bien

que l'absence de populations archaïques comparables empêche de confirmer cette théorie. L'analyse comparative des restes de Coteau-du-Lac avec ceux de l'ossuaire Fairty en Ontario (Iroquois) et ceux de Robinson au Wisconsin (Algonquins) porte à croire qu'ils appartiennent probablement à une population algonquine mais, encore là, la théorie n'est pas confirmée.

Acknowledgement

Dr. J.F. Melbye, of the Department of Anthropology of the University of Toronto, provided the author with considerable advice and assistance in the analysis and preparation of this report.

Introduction

The human osteological material from the cloverleaf bastion of the fort at Coteau-du-Lac was analyzed in the physical anthropology laboratory of the University of Toronto under contract to the Department of Indian and Northern Affairs.

At the onset it should be made clear that the skeletons do not represent Christian European burials from the historic fort; rather, they are aboriginal skeletons from an archaeologically undetermined time period which were found during excavation of the cloverleaf bastion and seemed to have been interred prior to its construction. Artifacts found with most of the skeletons were in questionable association. The site is multicomponent with major disturbances occuring during the construction of the cloverleaf bastion. Therefore, the goals of this analysis were: to describe the skeletal material that was found; to derive demographic information on this population; to suggest the temporal position of the skeletons -- more specifically, to determine, through the use of biological data, to which time period they would seem to be most closely related -- and to suggest spatial relationships with other populations.

The skeletal material from the cloverleaf bastion of the fort at Coteau-du-Lac is very fragmentary. Generally, preservation of the bone is good; however, extensive historic disturbances left individual bones broken and most individual burials scattered. In the course of this analysis, only two relatively complete individual burials

could be extracted from the fragmentary material. For the most part, this study was involved with populations of bones, not with populations of individuals.

The fragmentary nature of the material created two problems in the analysis. The first of these was that metric data were nearly impossible to obtain. Extensive reconstruction did not alter the situation. Therefore, the greatest reliance was placed on non-metric data. The second problem was the small sample size throughout the analysis. Statistics based on these small samples are of limited value in quantifying the observations made on this population. Regardless of the foregoing difficulties, the skeletons from the cloverleaf bastion of the fort at Coteau-du-Lac did yield some information.

Description

Crania

Table 1 shows the morphological observations made on the skulls and the incidence of occurrence of each trait. Only one skull (9G49B1) is sufficiently complete to allow measurement. Maximum cranial length is 210 mm; maximum cranial breadth, 138 mm. The cranial index is 65.7, dolichocephalic.

Mandibles

Morphological observations and incidences of traits on the mandibles are listed in Table 2. No measurements were possible.

Vertebrae

Tables 3-7 show observations and incidences of traits found in each region of the vertebral column. No information is given for the sacral region as all sacra are too fragmentary to yield any data.

Innominates

Four complete left innominates, six left and four right ischial fragments, two left pubic fragments and 20 pieces of ilia were examined. They are discussed further in the section on demography.

Clavicles

No measurements were possible. Observations are shown in Table 8.

Scapulae

One left and one right scapula show defect in ossification of the glenoid fossa resulting in a pit-like interruption along the inferior margin of the fossa. Other observations are listed in Table 9.

Humeri

No length measurements were possible on any of the humeri. Table 10 shows the incidences of traits observed.

Radii and Ulnae

The maximum length measurement of one right radius is 252 mm. The maximum length of a right ulna from the same individual (9G49B1) is 273 mm. No other measurements were possible. Tables 11 and 12 summarize the morphological observations.

Femora

Maximum length measurements were possible from one left and one right femur: 444 mm and 445 mm respectively. The platymeric indices of these two femora are 72.7 and 73.8 respectively. Observations on the femora are shown in Table 13.

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one right femur: 444 mm and 445 mm respectively. The platymeric indices of these two femora are 72.7 and 73.8 respectively. Observations on the femora are shown in Table 13.

Patellae

The observations made on the patellae are shown in Table 14. Only two patellae, one from each side, exhibit pathological symptoms.

Fibulae

Observations (Table 16) are limited to pathology. No measurements were possible.

Calcaneus

Of all carpals and tarsals, only the calcaneus presented a population sample. Table 17 lists the incidences of the traits observed.

Maxillary Dentition

Table 18 presents the data on the maxillary dentition. Attrition is scored by stages of development: 1, if cusps are blunted; 2, if the occlusal surface is worn flat; 3, if the pulp chamber is exposed, and 4, if all occlusal enamel is worn away. The data may be summarized by saying that there are no congenitally absent teeth, pre-mortem tooth loss is most common for incisors and third molars, caries are rare, abcesses are found for premolars and molars, attrition is common to all teeth and tends to be either slight or extreme, and dental anomalies are rare.

Mandibular Dentition

The same pattern of dental traits is found in the mandibular dentition (Table 19) as in the maxillary dentition. One left first premolar is peg-shaped.

Burials

Burial 9G49A1

This skeleton represents an adult female. All teeth are present in the right half of the mandible except the third molar, which was lost post-mortem. A single occlusal caries is present in the second molar. Attrition is extreme in the front teeth, exposing the pulp chamber, and moderate in the premolars and molars. The latter teeth are worn flat though the pulp is not exposed.

Both tibiae and the left humerus appear gracile and all bones are not heavily muscle-marked. The right patella lacks a vastus notch and the left calcaneus shows an hourglass-shaped anterior articular facet.

Associated with this burial is the partial skeleton of an infant approximately 18 months (± 3 months) old. The infant is represented by two deciduous central incisors, a partially erupted deciduous canine, a deciduous molar fragment, the arch of the atlas vertebra, two vertebral centra, and several rib fragments.

Burial 9G49B1

This is the most complete skeleton from the site. It represents an adult male with an age of 41 years calculated from the pubic symphysis (McKern and Stewart 1957). Stature, calculated from the femur and the tibia, is 170.4 cm (67 in.) using the equation for Mongoloids (Trotter and Gleser 1958). Measurements taken on this burial are presented in

Table 20. This individual is robust with heavy muscle-marking on all bones. One unusual anomaly, an ossified thyroid cartilage, is present. Evidence of trauma includes healed fractures of four left ribs and a healed fracture of the left ulna 5 cm above the distal end.

Both superior articular facets of the atlas vertebra are hourglass-shaped. The superior articular facets of the third cervicle vertebra show slight lipping and osteoporotic degeneration, and the five thoracic vertebral bodies present show slight lipping, as do all five lumbar vertebral bodies. The left humberus has a septal aperture and both humeri show slight lipping around all facets. The left radius shows slight lipping as does the previously mentioned left ulna with the fracture. Neither of the right forearm bones nor the lower limbs show any pathological symptoms.

Preservation of the mandible, maxilla and dentition is good. Both upper right premolars, the upper right first molar, and the upper left third molar were lost pre-mortem with associated abcesses. Both lower left incisors, the lower left canine, lower left second and third molars and the lower right first molar were also abcessed. Attrition in all teeth exposed the pulp chambers. All upper incisors exhibit marked shovelling, the upper right third molar has an enamel extension and pearl, and the lower left first molar has an enamel extension. The lower right first premolar is peg-shaped. The dental health of this individual was generally poor.

Demography

Number Of People Represented

Simple counts were made of different portions of bones. The largest total is considered to be the minimum number of people represented. Some examples of total numbers of different bones include 6 left clavicle shafts, 7 atlas vertebrae, 10 axis vertebrae, 9 right patellae, 10 right acromion processes of the scapula, and 11 right mandibular body fragments. Eleven is the highest total of all the bone counts from the site. However, all the mandible fragments are from individuals over 12 years of age. Since the total skeletal collection includes 3 individuals under the age of 12, the minimum number of individuals is raised to 14. This is, of course, the most conservative estimate and it would not be unlikely that at least 20 people are represented in the collection.

Age Distribution

Estimating the age of fragmentary remains is a multi-dimensional problem in which the investigator must draw upon many diverse sources of information. The best source, pubic symphysis, is possible for one individual, a male (9G49B1) with a calculated age of 41 years. The remaining individuals include two infants of less than 2 years of age, one child of approximately 7 years, two adolescents of 12 to 18 years, and at least eight more adults (see Table 21).

Sex Ratio

Four left adult innominate bones are complete enough to be sexed with some degree of certainty. Two males, one of them lacking a fused iliac crest, one female, and one probable female are present. While the sample size is inadequate, it suggests a roughly equal sex ratio for these burials.

Calculation of Stature

Stature was calculated for one individual from the femur and the tibia. This individual is 170.4 cm or 67 in. tall. No other estimates were possible (see Burial 9G49B1).

Pathology and Trauma

Pathological observations are presented in the tables for each of the types of bones. Degeneration consists most commonly of osteophytosis at articular facets (arthritis) and occasionally of slight osteoporosis. The lumbar region of the vertebral column is the area most commonly affected by pathological symptoms. The general health of this population as reflected in the skeletons was good.

Trauma consists of healed fractures of one distal end of the left ulna, four left ribs, one Schmorl's node in the thoracic region and perhaps some of the teeth lost pre-mortem, though evidence of the latter is uncertain. The broken ulna is that portion which would be exposed if the left forearm were raised in defence of a blow or to break a fall. This individual also exhibits broken left ribs. If only the left arm were broken or if the left arm and right ribs were involved, the former, defensive, hypothesis might be the more acceptable one; however, as all injuries are found on the same side of the body, a fall is at least as likely an explanation.

Intersite Comparisons

Temporal Relationships

It is generally accepted that gene frequencies of populations change through time; that is, populations evolve. By comparing gene trait frequencies between earlier and later manifestations of populations, one can measure the amount of change and quantify the genetic distance. It is therefore possible to compare an unknown population to known populations to determine relative genetic proximity. Using a time scale and known popula- tions, one can determine whether an unknown group is more like earlier or later populations. Comparison of geographically close populations is desired when dealing with problems of temporal position within an area; or, conversely, temporally similar populations when dealing with spatial-genetic distance. This technique was tested with great success by Dr. James E. Anderson at the Serpent Mound site. However, the present dearth of biological data on osteological collections is the greatest limitation to this comparative technique, and a researcher is limited in his choice of comparable material.

The skeletons from the cloverleaf bastion of the fort at Coteau-du-Lac are compared to the skeletons from the mound and pit burials of the Serpent Mound site in Table 22. The skeletons from the mound burials are Middle Woodland and those from the pits are Late Woodland. Of 26 compared trait frequencies, 17 Coteau-du-Lac traits are more like those of the pit specimens, 6 are more like those of the mound skeletons, and 3 are indeterminate. This evidence indicates

that the skeletons from the fort at Coteau-du-Lac more closely resemble the later population at the Serpent Mound site and thus may be correlated with the later occupations from this site. However, the lack of comparable Archaic populations makes this conclusion tentative.

Ethnic Relationships

Table 23 shows the comparison of the skeletal material from the fort at Coteau-du-Lac with material from the Fairty ossuary in Ontario (Iroquoian) and from the Robinson site in Wisconsin (Algonkian). Of 19 trait frequencies, 11 are more like the Algonkian series and 7 are more like the Iroquoian. Taking the relative geographical placement of these sites into consideration, however, the Algonkian tendency gains significance. Statistical testing of the difference between Robinson site and Coteau-du-Lac using the chi-square test for 20 traits at the 0.05 level of significance shows 3 traits of the 20 to be significantly different. One could expect that 1 trait out of 20 would show some difference, even if the two sites represented occupations of the same population. Two differences would be acceptable for closely related populations. Three differences are inconclusive considering the geographic separation of these two populations, particularly when it has already been shown that the group in question does not look Iroquoian. The fort at Coteau-du-Lac probably represents an Algonkian population though this is not conclusive. Comparison with geographically closer Algonkian groups of this time period, were such data available, would be useful.

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TABLES

Table 1. Cranial Morphology*

Observation	Frequency	Incidence (per cent)
Metopic Suture	0/5	0
Median Frontal Boss	2/3	66
Bilateral Frontal Boss	1/3	33
Right Frontal Groove	0/2	0
Left Frontal Groove	0/2	0
Right Supraorbital Notch	0/4	0
Left Supraorbital Notch	3/7	42
Right Supraorbital Foramena	4/4	100
Left Supraorbital Foramena	4/7	56
V-shaped Brow Ridges	5/5	100
Moderate Brow Ridges	2/5	40
Extreme Brow Ridges	3/5	60
Os Japonicum	0/6	0

* Tables 1 through 16 show which observations were made, the number of times it was possible to make each observation, and the observed frequency of each trait. Absolute frequency is presented as a fraction with the number of occurrences over the number of observations made. The incidence of occurrence is presented as a percentage.

Table 1 cont.

Observation	Frequency	Incidence (per cent)
Right Malar Tuberosity	1/3	33
Left Malar Tuberosity	1/3	33
Slight Lateral Tubercle	2/6	33
Moderate Lateral Tubercle	4/6	66
Precondylar Facets	0/2	0
Divided Hypoglossal	1/2	50
Left Turn of Transverse Sinus	1/3	33
Right Turn of Transverse Sinus	2/3	66
Multiple Parietal Foramena	1/4	25
Occipital Mound	3/3	100
Right Mastoid Notch	1/4	25
Left Mastoid Notch	1/5	20
Right Tympanic Thickening	0/2	0
Left Tympanic Thickening	1/3	33
Right Tympanic Dehiscence	0/2	0
Left Tympanic Dehiscence	1/3	33

Table 2. Mandible Morphology

Observation	Frequency	Incidence (per cent)
Chin Form		
medial	8/11	72
bilateral	3/11	27
Gonial Eversion		
slight	3/9	33
moderate	6/9	66
extreme	0/9	0
Double Mental Foramen		
right	0/4	0
left	0/8	0
Double Mandibular Foramen		
right	1/6	16
left	0/6	0
Mylohyoid Arch		
right	1/6	16
left	1/5	20
Mandibular Torus		
right	3/9	33
left	3/9	33
Condylar Arthritis		
slight	0/5	0
moderate	0/5	0
extreme	0/5	0

Table 3. Atlas Vertebrae

Observation	Frequency	Incidence (per cent)
Oval Superior Articular Facet		
right	3/6	50
left	0/2	0
Constricted Superior Articular Facet		
right	3/6	50
left	2/2	100
Lateral Bridge		
right	0/2	0
left	0/2	0
Posterior Bridge		
right	1/2	50
left	0/2	0
Double Foramen Transversarium		
right	0/2	0
left	0/2	0
Osteophytosis Arthritis		
Dens Facet		
slight	0/2	0
moderate	0/2	0
extreme	1/2	50

Table 3 cont.

Observation	Frequency	Incidence (per cent)
Superior Articular Facet		
slight	0/5	0
moderate	1/5	20
extreme	0/5	0
Inferior Articular Facet		
slight	0/5	0
moderate	1/5	20
extreme	0/5	0

Table 4. Axis Vertebrae

Observation	Frequency	Incidence (per cent)
Ossified Apical Ligament		
slight	0/3	0
moderate	1/3	33
extreme	0/3	0
Single Foramen Transversarium		
right	4/4	100
left	4/4	100
Double Foramen Transversarium		
right	0/4	0
left	0/4	0
Osteophytosis Arthritis		
Inferior Body		
slight	0/6	0
moderate	0/6	0
extreme	0/6	0
Right Inferior Articular Facet		
slight	0/6	0
moderate	1/6	16
extreme	1/6	16

Table 4 cont.

Observation	Frequency	Incidence (per cent)
Left Inferior Articular Facet		
slight	2/6	33
moderate	1/6	16
extreme	0/6	0
Right Superior Articular Facet		
slight	0/7	0
moderate	1/7	14
extreme	0/7	0
Left Superior Articular Facet		
slight	1/7	14
moderate	1/7	14
extreme	0/7	0
Dens Facet		
slight	0/6	0
moderate	1/6	16
extreme	0/6	0

Table 5. Cervical Vertebrae 3-7

Observation	Frequency	Incidence (per cent)
Double Foramen Transversarium		
right	1/10	10
left	1/10	10
Spinous Process		
single	5/9	55
divided	4/9	44
Osteophytosis Arthritis		
Right Superior Articular Facet		
slight	0/12	0
moderate	2/12	16
extreme	0/12	0
Left Superior Articular Facet		
slight	1/12	8
moderate	1/12	8
extreme	0/12	0
Right Inferior Articular Facet		
slight	1/12	8
moderate	0/12	0
extreme	1/12	8

Table 5 cont.

Observation	Frequency	Incidence (per cent)
Left Inferior Articular Facet		
single	1/12	8
moderate	0/12	0
extreme	1/12	8
Superior Body		
single	0/12	0
moderate	0/12	0
Exrememem	0/12	0
Inferior Body		
single	1/12	8
moderate	0/12	0
extreme	1/12	8

Table 6. Thoracic Vertebrae

Pathology and Trauma Osteophoyosis Arthritis	Frequency	Incidence (per cent)
Right Superior Articular Facet		
slight	1/16	6
moderate	0/16	0
extreme	0/16	0
Left Superior Articular Facet		
slight	0/9	0
moderate	0/9	0
extreme	0/9	0
Right Inferior Articular Facet		
slight	2/13	15
moderate	2/13	15
extreme	0/13	0
Left Inferior Articular Facet		
slight	2/9	22
moderate	0/9	0
extreme	0/9	0
Right Body Rib Facet		
slight	1/8	12
moderate	0/8	0
extreme	0/8	0
Left Body Rib Facet		
slight	1/8	12

Table 6 cont.

Pathology and Trauma Osteophytosis Arthritis	Frequency	Incidence (per cent)
moderate	1/8	12
extreme	0/8	0
Right Transverse Rib Facet		
slight	0/4	0
moderate	0/4	0
extreme	0/4	0
Left Transverse Rib Facet		
slight	0/3	0
moderate	0/3	0
extreme	0/3	0
Superior Body		
slight	2/11	18
moderate	0/11	0
extreme	1/11	9
Inferior Body		
slight	3/9	33
moderate	0/9	0
extreme	1/9	11
Schmorl's Node		
Superior Body	0/10	0
Inferior Body	1/10	10

Table 7. Lumbar Vertebrae

Observation	Frequency	Incidence (per cent)
Spondylolysis	0/9	0
Osteophytosis Arthritis		
Right Superior Articular Facet		
slight	2/8	25
moderate	1/8	12
extreme	1/8	12
Left Superior Articular Facet		
slight	2/8	25
moderate	1/8	12
extreme	1/8	12
Right Inferior Articular Facet		
slight	2/8	25
moderate	1/8	12
extreme	1/8	12
Left Inferior Articular Facet		
slight	2/8	25
moderate	1/8	12
extreme	1/8	12

Table 7 cont.

Observation	Frequency	Incidence (per cent)
Superior Body		
slight	0/9	0
moderate	5/9	55
extreme	1/9	11
Inferior Body		
slight	0/9	0
moderate	5/9	55
extreme	1/9	11
Schmorl's Node		
Superior Body	0/9	0
Inferior Body	0/9	0

Table 8. Clavicles

Observation	Frequency	Incidence (per cent)
Slight Deltoid Tubercle		
right	3/4	75
left	1/6	16
Moderate Deltoid Tubercle		
right	1/4	25
left	2/6	33
Extreme Deltoid Tubercle		
right	0/4	0
left	0/6	0
Slight Conoid Tubercle		
right	3/4	75
left	3/6	50
Moderate Conoid Tubercle		
right	0/4	0
left	3/6	50
Extreme Conoid Tubercle		
right	1/4	25
left	0/6	0
Pit Along Trapezoid Line		
right	0/4	0
left	3/6	50

Table 8 cont.

Observation	Frequency	Incidence (per cent)
Medial Osteophytosis		
Slight to Extreme		
right	-	-
left	-	-
Later Osteophytosis		
Right		
slight	0/2	0
moderate	0/2	0
extreme	0/2	0
Left	-	-

Table 9. Scapulae

Observation	Frequency	Incidence (per cent)
Rectangular Acromion Process		
right	1/3	33
left	-	-
Lunate Acromion Process		
right	2/3	66
left	-	-
Double Facet of Acromion		
right	0/2	0
left	-	-
Accessory Epiphysis at Acromion		
right	0/2	0
left	-	-
Osteophytosis Arthritis		
Right Glenoid Fossa		
slight	1/5	20
moderate	0/5	0
extreme	1/5	20
Left Glenoid Fossa		
slight	1/2	50
moderate	0/2	0

Table 9 cont.

Observation	Frequency	Incidence (per cent)
extreme	0/2	0
Right Acromion Facet		
slight	1/2	50
moderate	0/2	0
extreme	1/2	50
Left Acromion Facet		
slight to extreme	-	-

Table 10. Humeri

Observation	Frequency	Incidence (per cent)
Septal Aperture		
right	1/6	16
left	2/4	50
Supratrochlear Spur		
right	0/6	0
left	0/3	0
Deltoid Tuberosity		
right	0/2	0
left	0/2	0
Pitting of Olecranon Fossa		
right	5/7	73
left	2/4	50
Pitting of Coronoid Fossa		
right	2/6	33
left	3/4	75
Pitting of Radial Fossa		
right	1/5	20
left	2/4	50
Right Head		
slight	1/3	33
moderate	0/3	0
extreme	1/3	33

Table 10 cont.

Observation	Frequency	Incidence (per cent)
Osteophytosis Arthritis		
Left Head		
slight	0/1	0
moderate	0/1	0
extreme	0/1	0
Right Trochlea		
slight	1/3	33
moderate	0/3	0
extreme	1/3	33
Left Trochlea		
slight	1/1	100
moderate	0/1	0
extreme	0/1	0
Right Capitulum		
slight	1/3	33
moderate	1/3	33
extreme	1/3	33
Left Capitulum		
slight	1/1	100
moderate	0/1	0
extreme	0/1	0

Table 11. Radii*

Observations	Frequency	Incidence (per cent)
Osteophytosis Arthritis		
Right Proximal		
slight	1/3	33
moderate	1/3	33
extreme	0/3	0
Left Proximal		
slight	0/1	0
moderate	0/1	0
extreme	0/1	0
Right Distal		
slight	1/3	33
moderate	0/3	0
extreme	0/3	0
Left Distal		
slight	0/1	0
moderate	0/1	0
extreme	0/1	0

* Maximum Length: right, 252 mm; left, not measurable.

Table 12. Ulnae*

Observation	Frequency	Incidence (per cent)
Oval Olecranon Facet		
right	5/12	41
left	1/7	14
Hourglass-shaped Olecranon Facet		
right	4/12	33
left	4/7	56
Double Olecranon Facet		
right	3/12	25
left	2/7	28
Osteophytosis Arthritis		
Right Proximal		
slight	2/10	20
moderate	2/10	20
extreme	1/10	10
Left Proximal		
slight	4/9	44

* Maximum Length: right, 273 mm; left, not measurable.

Table 12 cont.

Observation	Frequency	Incidence (per cent)
moderate	1/9	11
extreme	0/9	0
Right Distal		
slight	0/1	0
moderate	0/1	0
extreme	0/1	0
Left Distal		
slight to extreme	-	-

Table 13. Femora

Observation	Frequency	Incidence (per cent)
Third Trochanter		
right	4/7	56
left	3/6	50
Fossa of Allen		
right	0/5	0
left	0/5	0
Osteophytosis Arthritis		
Right Head		
slight	1/6	16
moderate	0/6	0
extreme	0/6	0
Left Head		
slight	1/5	20
moderate	0/5	0
extreme	1/5	20
Right Condyles		
slight	2/4	50
moderate	1/4	25
extreme	0/4	0
Left Condyles		
slight	1/2	50
moderate	0/2	0
extreme	0/2	0

Table 14. Patellae

Observation	Frequency	Incidence (per cent)
Vastus Notch		
right	1/9	11
left	1/9	11
Pathology		
Osteoporosis of Facet		
right	1/9	11
left	1/9	11
Osteophytosis		
right	1/9	11
left	1/9	11

Table 15. Tibiae*

Observation	Frequency	Incidence (per cent)
Squatting Facet		
right	0/4	0
left	0/4	0
Osteohpytosis Arthritis		
Proximal		
right	0/1	0
left	-	-
Distal		
right	0/4	0
left	0/5	0

* Maximum Length: right, not measureable; left, 376 mm.

Table 16. Fibulae

Pathology	Frequency	Incidence (per cent)
Osteophytosis arthritis		
Proximal		
right	-	-
left	0/1	0
Distal		
right	0/3	0
left	1/2	50
Osteoporosis of Shaft		
right	0/3	0
left	1/3	33

Table 17. Calcaneus

Observation	Frequency	Incidence (per cent)
Oval Anterior Articular Facet		
right	1/4	25
left	1/6	16
Hourglass Anterior Articular Facet		
right	1/4	25
left	3/6	50
Double Anterior Articular Facet		
right	2/4	50
left	2/6	33

Table 18. Adult Maxillary Dentition

	Right								Left							
	M3	M2	M1	P2	P1	C	I2	I1	I1	I2	C	P1	P2	M1	M2	M3
Congential Absence	0/7	0/7	0/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/7	0/8	0/7	0/6	0/4
Pre-mortem Loss	0/7	0/7	1/7	1/7	1/7	1/6	3/6	3/6	2/5	2/5	1/5	1/7	0/8	0/7	0/6	0/4
Occlusal Caries	0/7	0/7	0/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/7	0/8	1/7	1/6	0/4
Interstitial Caries	0/7	0/7	0/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/7	0/8	0/7	0/6	0/4
Abcesses	1/7	1/7	3/7	1/7	1/7	0/6	0/6	0/6	0/5	0/5	0/5	1/7	0/8	1/7	1/6	0/4
Attrition 1	0/7	1/7	0/7	1/7	1/7	0/6	1/6	0/6	0/5	1/5	3/5	3/7	0/8	0/7	1/6	0/4
2	0/7	0/7	0/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/7	0/8	1/7	0/6	0/4
3	2/7	2/7	1/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	2/5	1/7	2/8	4/7	3/6	0/4
4	1/7	3/7	4/7	4/7	1/7	1/6	1/6	1/6	2/5	1/5	1/5	1/7	1/8	2/7	1/6	0/4
Peg-shaped Teeth	0/7	0/7	0/7	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/7	0/8	0/7	0/6	0/4

Table 18 cont.

	Right								Left							
	M3	M2	M1	P2	P1	C	I2	I1	I1	I2	C	P1	P2	M1	M2	M3
Carabelli Cusp	0/7	0/7	0/7											0/7	0/6	0/4
Carabelli Pit	0/7	0/7	1/7											0/7	0/6	0/4
Carabelli Fissure	0/7	0/7	0/7											0/7	0/6	0/4
Enamel Extension	1/7	0/7	1/7											3/7	2/6	0/4
Enamel Pearl	1/7	0/7	0/7											0/7	0/6	0/4

Table 19. Adult Mandibular Dentition

	Left								Right							
	M3	M2	M1	P2	P1	C	I2	I1	I1	I2	C	P1	P2	M1	M2	M3
Congenital Absence	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5
Pre-mortem Loss	0/4	0/4	0/4	0/4	0/4	0/4	1/4	1/4	2/5	2/5	1/5	0/5	1/5	0/5	0/5	1/5
Occlusal Caries	0/4	1/4	3/4	0/4	0/4	0/4	0/4	0/4	0/5	0/5	0/5	0/5	0/5	3/5	4/5	0/5
Interstitial Caries	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/4	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5
Abcesses	0/4	0/4	2/4	1/4	0/4	0/4	0/4	0/4	1/5	1/5	1/5	0/5	0/5	0/5	1/5	1/5
Attrition 1	1/4	1/4	0/4	1/4	1/4	0/4	0/4	0/4	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5
2	0/4	0/4	1/4	0/4	0/4	0/4	0/4	0/4	0/5	0/5	0/5	1/5	1/5	0/5	1/5	0/5
3	1/4	2/4	0/4	0/4	0/4	1/4	0/4	0/4	0/5	0/5	3/5	2/5	1/5	3/5	2/5	2/5
4	0/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	2/5	2/5	1/5	0/5	1/5	1/5	1/5	0/5
Peg-shaped Teeth	0/4	0/4	0/4	0/4	1/4	0/4	0/4	0/4	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5

Table 19 cont.

	Left								Right							
	M3	M2	M1	P2	P1	C	I2	I1	I1	I2	C	P1	P2	M1	M2	M3
Protostylid	0/4	0/4	0/4											0/5	0/5	0/5
Enamel Extension	0/4	0/4	0/4											1/5	0/5	0/5
Enamel Pearl	0/4	0/4	0/4											0/5	0/5	0/5

Table 20. Burial 9G49B1 Measurements (in mm)*

Cranial Length	210.0
Cranial Breadth	138.0
Cranial Index	65.7
Right Humerus Length	329.0
Left Radius Length	252.0
Right Ulna Length	273.0
Right Femur Length	445.0
sagittal diameter	24.0
coronal diameter	32.5
Platymeric Index	73.8
Left Femur Length	444.0
sagittal diameter	24.0
coronal diameter	33.0
Platymeric Index	72.7
Right Tibia Length	376.0
sagittal diameter	30.7
transverse diameter	20.0
Platyenemic Index	65.1

* Male, 41 years old; height, 170.4 cm.

Table 21. Age Distribution

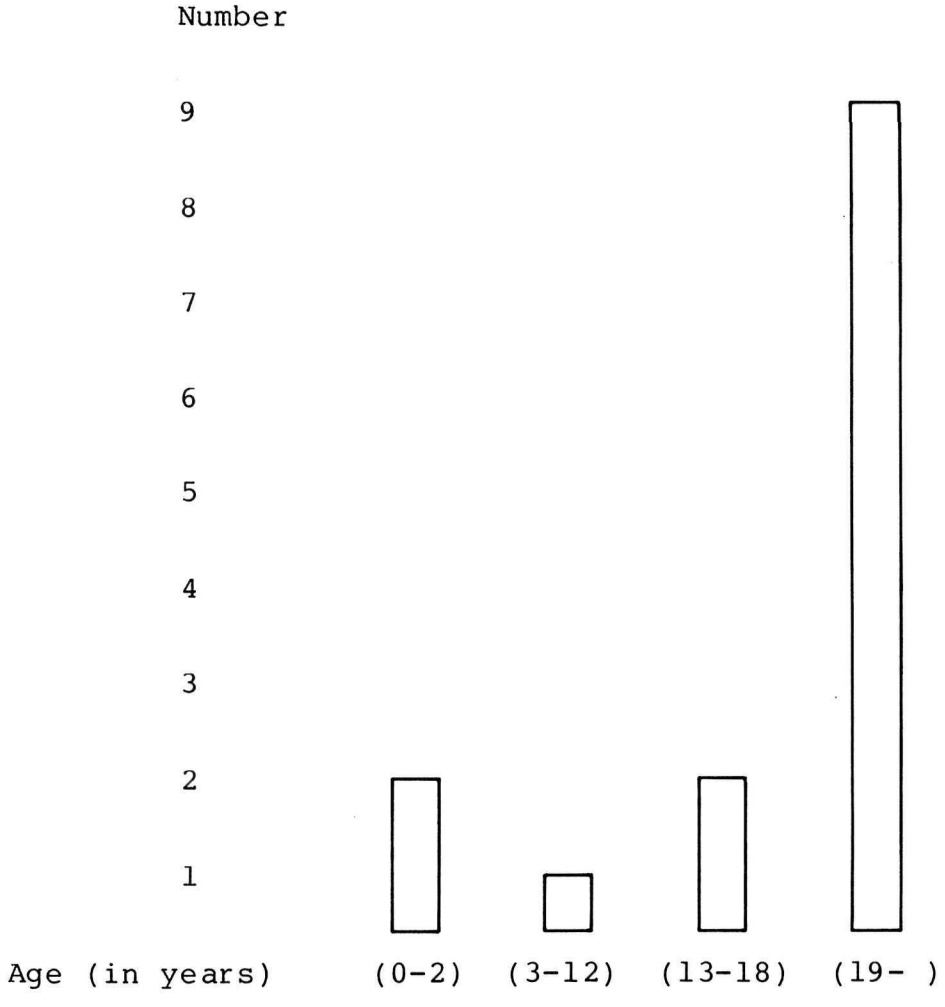

Table 22. Temporal Position of Burials From the Fort at Coteau-du-Lac (per cent)

Observation	Serpent Mounds (Middle Woodland)	Coteau-du-Lac	Serpent Pits (Late Woodland)
Metopic Suture	0	0	0
Right Parietal Foramena	45	0	33
Left Parietal Foramena	45	50	44
Supraorbital Notch	44	27	50
Supraorbital Foramen	47	72	37
Divided Hypoglossal Canal	36	50	21
Left Turn Transverse Sinus	13	33	23
Tympanic Dehiscence	11	20	19
Tympanic Thickening	3	20	5
Mastoid Notch	53	22	48
Malar Tuberosity	55	33	52

Table 22 cont.

Observation	Serpent Mounds (Middle Woodland)	Coteau-du-Lac	Serpent Pits (Late Woodland)
V-Shaped Brow Ridge	72	100	85
Lateral Tubercle	55	66	62
Mandibular Torus	2	33	7
Median Chin	10	72	42
Bilateral Chin	49	27	35
Mylohyoid Arch	45	18	20
Multiple Mental Foramena	1	0	9
Multiple Mandibular Foramena	19	8	46
Bridges on Atlas	31	12	10
Septal Aperature	17	30	39
Third Trochanter	18	50	8
Vastus Notch	47	11	27
Oval Anterior Facet of Calcaneus	24	20	24
Hourglass Facet of Calcaneus	53	40	47

Table 22 cont.

Observation	Serpent Mounds (Middle Woodland)	Coteau-du-Lac	Serpent Pits (Late Woodland)
Double Anterior Facet of Calcaneus	24	40	29

More like Serpent Pits: 17 traits
More like Serpent Mounds: 6 traits
Indeterminate: 3 traits
Total: 26 traits

Table 23. Ethnic Relationships of Burials From the Fort at Coteau-du-Lac (per cent)

	Fairty (Iropquoian)	Coteau-du-Lac	Robinson (Algonkian)
Metopic Suture	2	0	0
Frontal Grooves	63	0	4
Supraorbital Foramen	28	72	30
V-Shaped Brow Ridge	100	100	70
Left Turn Transverse Sinus	18	33	28
Right Turn Transverse Sinus	73	66	68
Tympanic Dehiscence	39	20	34
Mandibular Torus	0	33	0
Mylohyoid Arch	12	18	10
Multiple Mental Foramena	2	0	8
Lateral Bridge of Atlas	7	0	11
Posterior Bridge of Atlas	18	25	9

Table 23 cont.

	Fairty (Iroquoian)	Coteau-du-Lac	Robinson (Algonkian)
Multiple Transverse Foramena (C3-C7)	10	20	14
Septal Aperture	35	30	16
Third Trochanter	6	50	0
Vastus Notch	26	11	18
Oval Anterior Facet of Calcaneus	34	20	25
Hourglass Facet of Calcaneus	31	40	40
Double Anterior Facet of Calcaneus	33	40	35

More Like Robinson:	11 traits
More Like Fairty:	7 traits
Indeterminate:	1 trait
Total:	19 traits

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