

THE ARCHAEOLOGY OF BONE
CAVE, MILLER COUNTY,
MISSOURI

E. ADAMSON HOEBEL

VOLUME 40 : PART 2
ANTHROPOLOGICAL PAPERS OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK : 1946

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PREFACE

THE AUTHOR UNDERTOOK A LIMITED EXCAVATION of the Bone Cave site, in Miller County, Missouri, under the auspices of the American Museum of Natural History in the summer of 1943. The results of this undertaking are presented in this report. To the Trustees of the Museum and to Dr. Harry L. Shapiro, Chairman of the Department of Anthropology, my appreciation is due for their endorsement and support of the project, which was financed from the Frederick G. Voss Anthropological and Archaeological Fund.

I am deeply in debt to Mr. Nels C. Nelson, Curator Emeritus of Prehistoric Archaeology, for his kindly assistance and interest in the process of classification and interpretation of the materials. The same obligation is owed to Mr. Junius B. Bird, Assistant Curator of Archaeology, especially for his supervision of the photography of the plates. Their excellence is due to his skill. Miss Bella Weitzner, Associate Curator of Ethnology, saw the manuscript through the press.

Without the generous and unreserved permission of the owner of the cave to excavate within it, the entire operation would, of course, have been impossible. This was the indispensable contribution of Mr. James Jeffries.

Mr. Sidney Phillips and Mr. Lee Stanton, through whose farms we had to pass to gain access to the cave, added to the joy of the work with their pleasant companionship and occasional assistance when their time permitted, as did also Prof. Ray Irwin and Mr. Ray Williams.

Mr. W. W. Gore, of Osage Beach, Missouri, solved the difficulties of transportation by putting his truck at our disposal. My wife, Frances Hoebel, lent a helpful hand with a trowel, and my son, Bartley, was a lusty and enthusiastic aid with the shovel and wheelbarrow in the removal of excavated debris.

To all these persons, and others unnamed, professional thanks and deepest personal appreciation.

E. ADAMSON HOEBEL

New York City
June 8, 1945

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INTRODUCTION

LOCATION AND NATURE OF THE CAVE

THE OZARK MOUNTAINS are a deeply eroded area of uplifted limestone, honeycombed by an uncounted number of caves. It has been known for nearly half a century that many of these caves show evidence of long occupation,¹ yet only a very small number have been explored by means of systematic archaeology. Local gold hunters have been more assiduous in turning the soil of the caves than have been the students of man. From Arkansas through Missouri, the belief exists in dozens of local legends that gold is buried in these caves. Sometimes it is Spanish gold; sometimes it is the hoard of a mythical settler, who buried his treasure and shouldered a musket to stride off to the War Between the States, never to return.

No gold has ever been found. But every resident of the hills knows there are Indian relics in the dirt of the caves. However, they do not dig them for Indian relics, except when the humid heat of the southern midwest summer makes the cool of a cave more pleasant dallying than the discomfort of a bottomland cornfield. After all, every farmhouse or cabin has its box or bagful of chert points turned up in the cornfields in the course of farming. So why bother to turn a shovel in the caves only to get more of something one already possesses in sufficiency? This may be reason enough for the hill country farmer, but it hardly excuses the archaeological neglect that the caves have suffered.

A well-watered and beautifully attractive hill country, far enough south to enjoy equable winters in post-glacial times and well beyond the reach of the farthest Pleistocene ice advances, it provided a near ideal home territory for the aboriginal hunter. In late prehistoric times, the woods were well stocked with small game; the magnificent clear-water streams abounded with fish and mussels, even as today. The rich bottomlands made good garden soil for the later maize growers, where these existed.

The northern Ozarks in central Missouri were unquestionably richly populated in protohistoric times. Almost any local farmer can point

to probable camp or village sites along the bottoms near his own home from which he has collected a hoard of points. But to date not even a reconnaissance mapping of the village sites has been made. The ridges are pimpled with hundreds of mounds, few of which (in the northern Ozarks) have been systematically studied.

Thirteen sizable caves lie within an arc of 10 miles radius to the east of the Bagnell Dam,² which formed the present Lake of the Ozarks. One cave, commercialized as a tourist attraction, was not tested. Another sheltered a herd of cattle and was too wet for working; consequently, it was not tested. The remaining 11 were sounded by sinking test pits. Of these, eight revealed sherds, artifacts, and charcoal in ample evidence of prolonged human occupation.

Bone Cave was finally selected for working because of its relative dryness, the depth of its deposits, and its relatively easy accessibility. Its romantic local name is derived from the tradition that when first discovered three generations ago, its floor was covered with exposed skeletons. This site is situated on the farm of Mr. James Jeffries, Glaze Township, Miller County, Missouri, at 92° 31' W., 38° 04' N. It lies approximately 3 miles due west of the present town of Brumley on the east side of Grandglaze Creek, which has an elevation 665 feet above sea level. The Glaze, at the point where it flows by Bone Cave, is a shallow, clear-water stream with a gravel bed about 50 feet wide. The east bank is heavily wooded with white oak (predominantly). One hundred and fifty feet back from the river, it rises sharply (40 degrees) to an elevation of 875 feet. The cave floor is at an elevation of approximately 750 feet.

As do almost all Ozark caves, Bone Cave opens to the southwest. It has the common Ozark form of a wide mouth with a moderately low ceiling. At the mouth the cave is 49 feet wide. Its height from the present floor level to the ceiling is 10 feet. It forms a single large chamber with no laterals. The walls converge to form a funnel 60 feet deep. At the back of the funnel a low tunnel 4 feet in diameter extends

¹ Bushnell, 1904, 294.

² A large electric power site completed in 1931.

an undetermined distance into the hill. A small stream seeps from this tunnel and keeps the back half of the cave covered with water most of the time. This is drained by seepage to the northwest wall of the cave and out through an underground fissure, which breaks through the face of the bluff about 10 feet below the present floor level of the cave some 45 feet from the cave itself. Thus Bone Cave is wet, as were all but two of the caves visited.

It was unfortunate for our work that the spring of 1943 was the wettest in the history of the white occupation of the Ozarks. This hampered our excavations in two ways. Not only were the deposits in the cave thoroughly soaked and kept so by ceiling seepage throughout half the summer, but the recurring floods washed out the farmers' corn plantings three times, so that the neighboring farmers were kept busy with their work and were not available for assistance in the digging. The younger men were in the Services or absent in war plants. As a result, the amount of debris that could be removed was, for the most part, limited to the quantity the archaeologist could handle alone.

THE NATURE OF THE CULTURE-BEARING DEPOSITS

The front two thirds of the cave floor is a heavy black ash and intruded humus compound 4 feet deep in the front center. Along the side walls, at the front, it is 2 feet deep. This is the occupation debris. It becomes progressively shallower toward the rear, and thins down to nothing two thirds of the way to the rear wall. Underlying this is a heavy sterile bottom of red-brown "gumbo" clay, formed by disintegration of limestone. With limited time and help, under the prevailing conditions of extreme wetness, it was not possible to penetrate this clay bottom. The excavations did not, therefore, reach the rock floor of the cave, or anywhere near it. By estimate, the floor apparently lies at least 8 feet below our deepest operations.

Fallen roof talus consisting of large limestone blocks is heavily interspersed throughout the debris. A barricade of four huge blocks 3 feet thick, 12 to 15 feet long, and 6 feet wide lies directly across the mouth of the cave. These rocks detached themselves so long ago that weathering has left no fresh scars, and the ceil-

ing from which they fell is of the same hue as the surrounding rock. However, the blocks rest on top of the culture-bearing levels, as was proved by excavating beneath them.

In remote antiquity, the cave extended about twice its present depth out toward the river. The vertical walls of the funnel are conspicuous. But the erstwhile roof has weathered away or collapsed, forming a sloping, rock-strewn terrace extending downward about 100 feet from the cave itself.

In laying out the grid for excavation, the base line was run tangent to the inside face of the large block in the center of the mouth. This gave the base line a northwest-southeast orientation. Parallel lines were staked out at six-foot intervals toward the back of the cave. The base line was lettered "A," and the successive lines B, C, D, and E. The northwest wall of the cave was taken as the "O" line, and the stake for Line 2 was set on Line A, 6 feet out from the cave wall. Stakes 2-8 were set out at six-foot intervals from Stake 1. Lines were run at right angles to the base line from each of the stakes. Each square was numbered from the lettered line closest to the base line and the numbered line on the side of the square farthest removed from the northwest wall. The excavated areas are cross-hatched in the accompanying diagram of the floor detail (Fig. 1). Excavations were extended 2 feet under the large fallen blocks in the mouth of the cave adjacent to sections A-4, A-5. These partially excavated sections, which fell outside our grid area, were labeled X5 and Y4, respectively. They are not indicated in Fig. 1.

The excavated culture-bearing debris consisted of a loose-packed mixture of black humus, ash, and charcoal in a layer 4 to 12 inches deep. Beneath this deposit, the material consisted of a brown, clayish-ash mixture extending down to a sterile, red clay layer. Within this two- to three-foot thick deposit were areas of close-packed wood ash 2 to 12 inches thick. These hearth areas ranged from diameters of 2 to 5 feet and occurred at varying depths. No outlines of hearthstones occurred. Rather, the hearths were laid between or against the blocks of roof talus. The hearth areas formed differentiated strata in the vertical cross-section, but they did not produce continuous levels of stratification. The excavated materials were, therefore, classified according to depth only, and

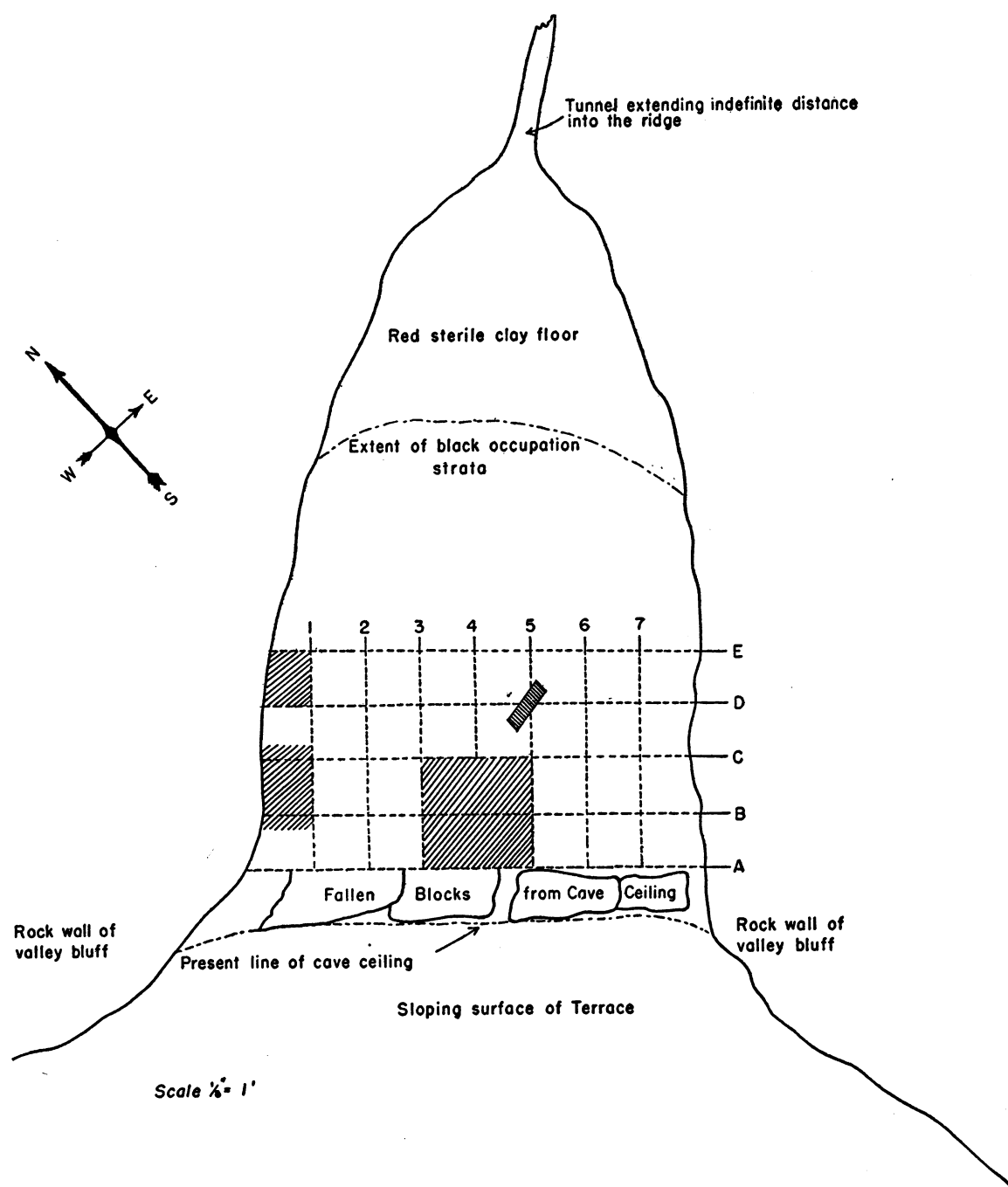


FIG. 1. Floor plan of Bone Cave. Excavated areas are cross-hatched.

were grouped in arbitrary levels 1 foot deep, measuring downward from the surface.

FAUNA

Numerous broken animal bones, usually in very small pieces, occurred in all levels of the site, and the broken shells of many fresh-water clams were found on the surface and throughout the deposits.

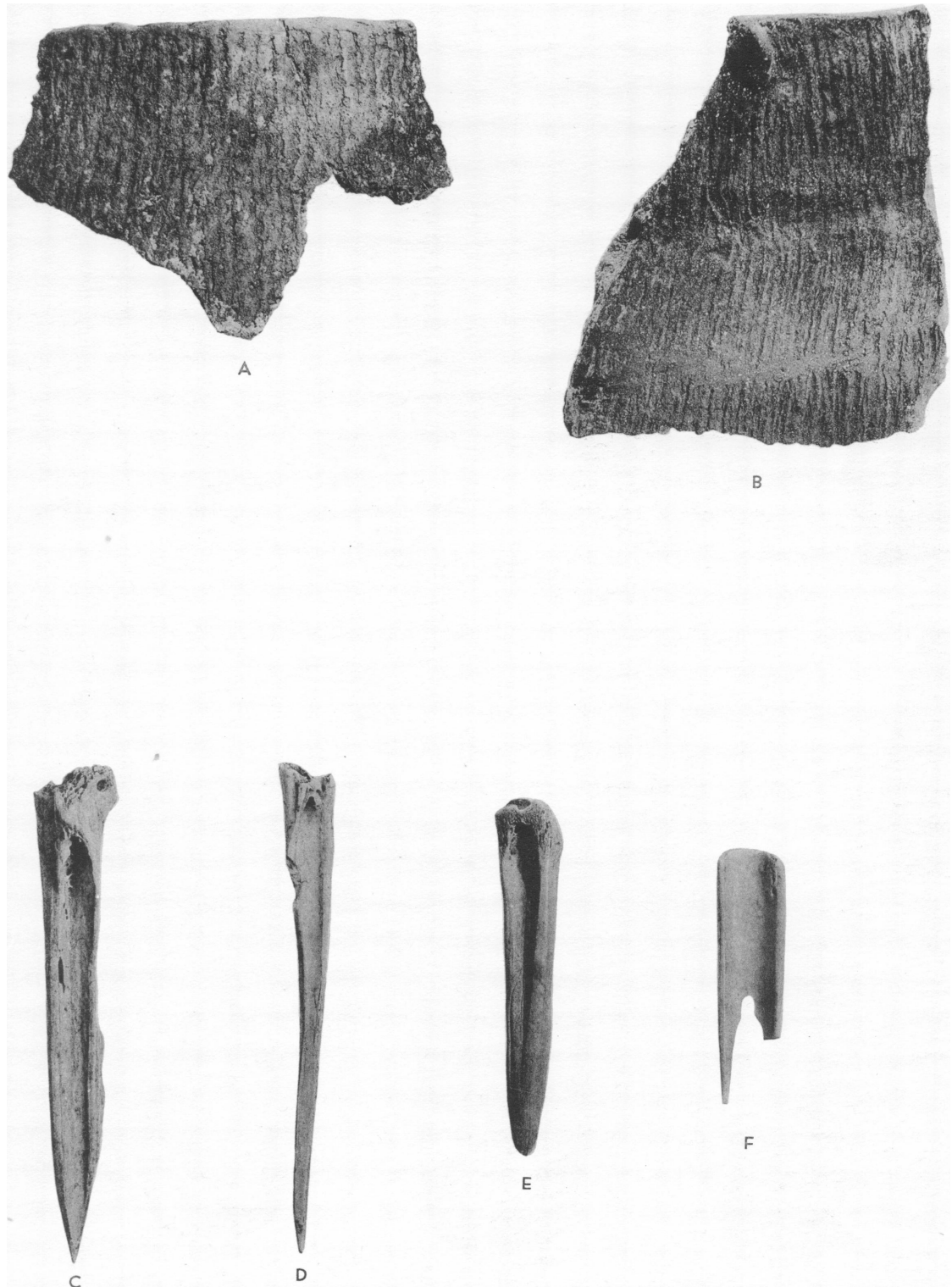
The range of animals, as identified from these broken bones, is very narrow; all forms are recent types which were numerous in this part of the Ozarks until the present century, and are still present to some extent. The most common beast killed and eaten by the human denizens of Bone Cave was the common deer (*Odocoileus*

virginianus). Other game, the remains of which were found in the cave, are the bobcat (*Lynx rufus*) and the raccoon (*Procyon lotor*). An isolated inferior maxillary of a turtle was recovered, as were several turtle shells without skulls.

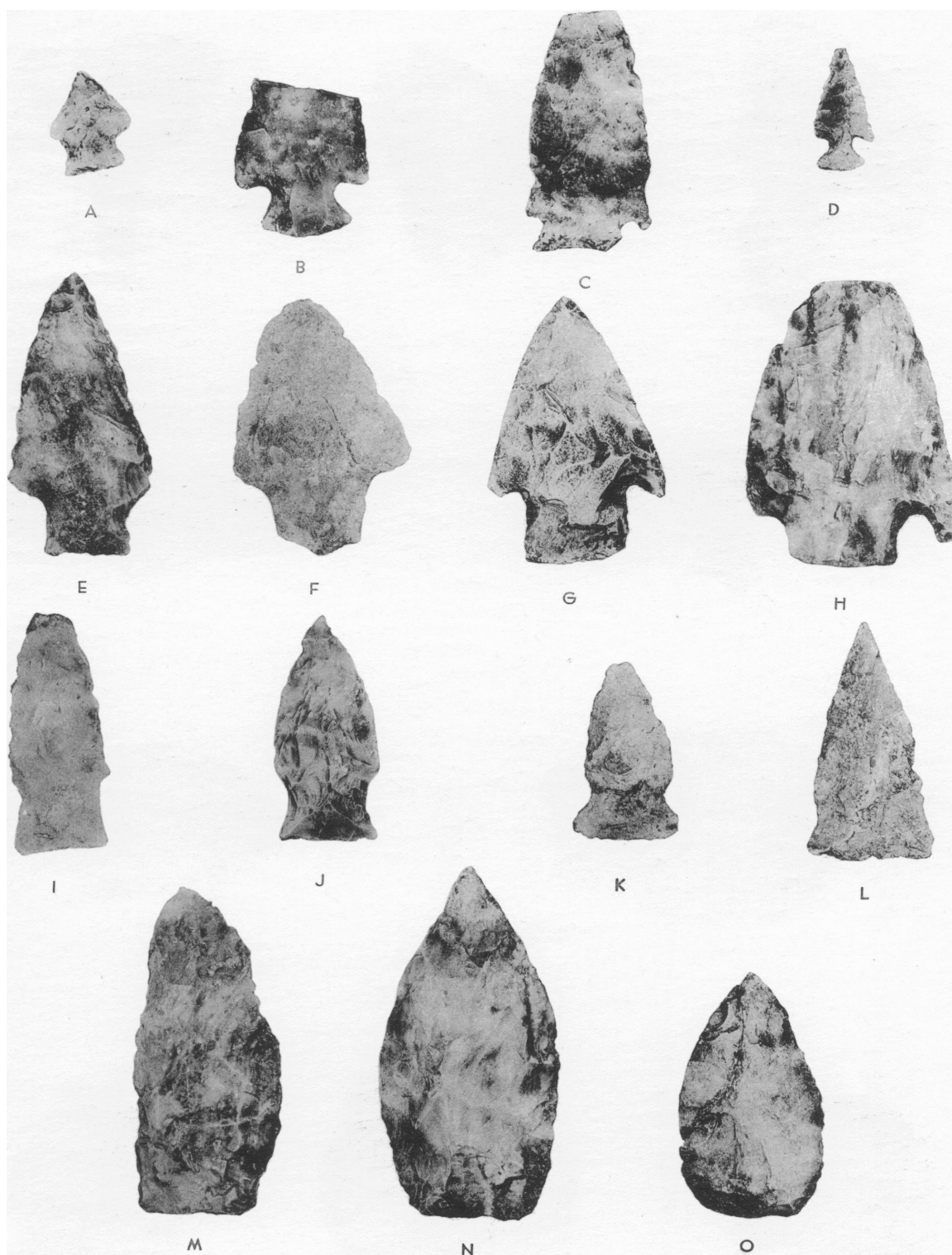
Bones of small, unidentified birds were common.

Fresh-water mussels were identified as two types: *Unio radiatus* Gmelin and *Unio ligimentius*. Dr. George H. Childs informs me that both species have a wide reported distribution in the northeastern part of the United States, but he has been unable to find any mention in the literature of their previously recorded occurrence in Missouri. Occasional shells of the snail, *Viviparis spiralis*, were also found in the deposits.

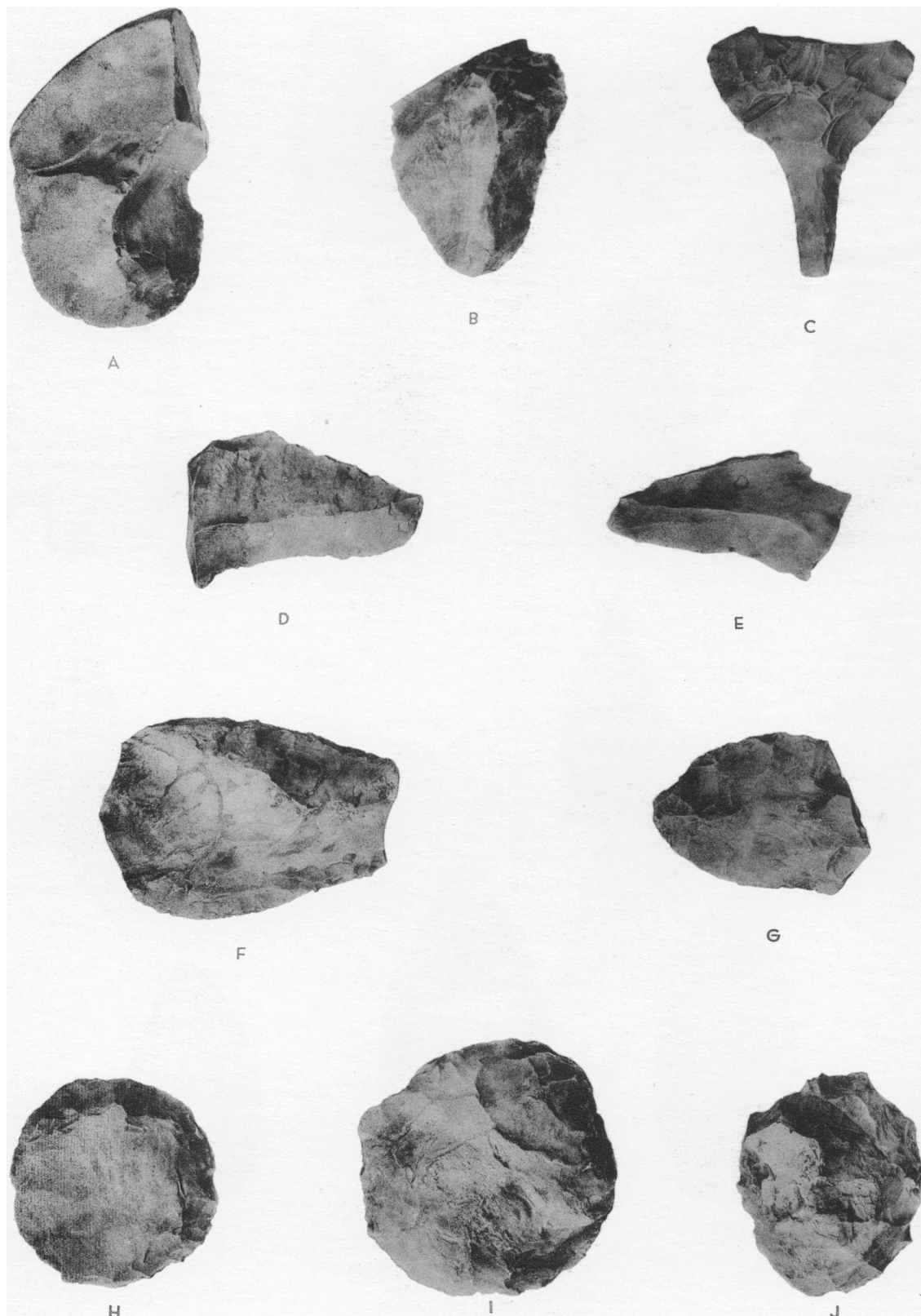
PLATES 13-17



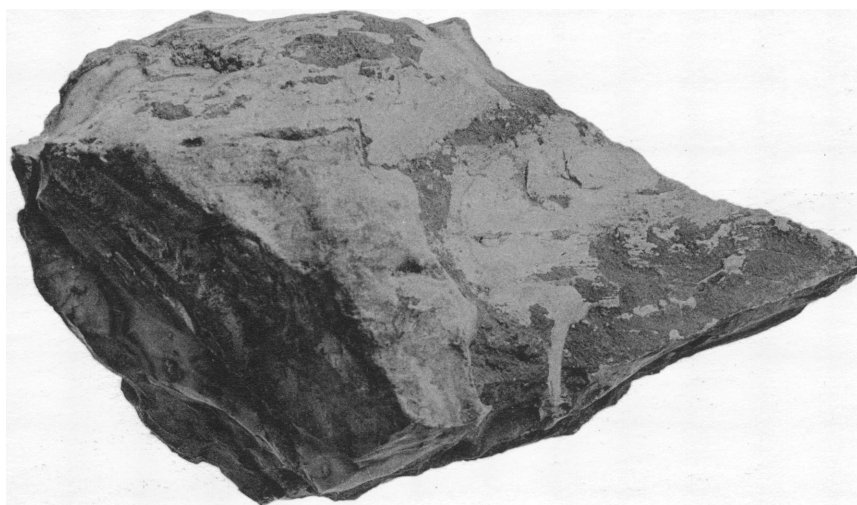
Rim sherds and bone artifacts



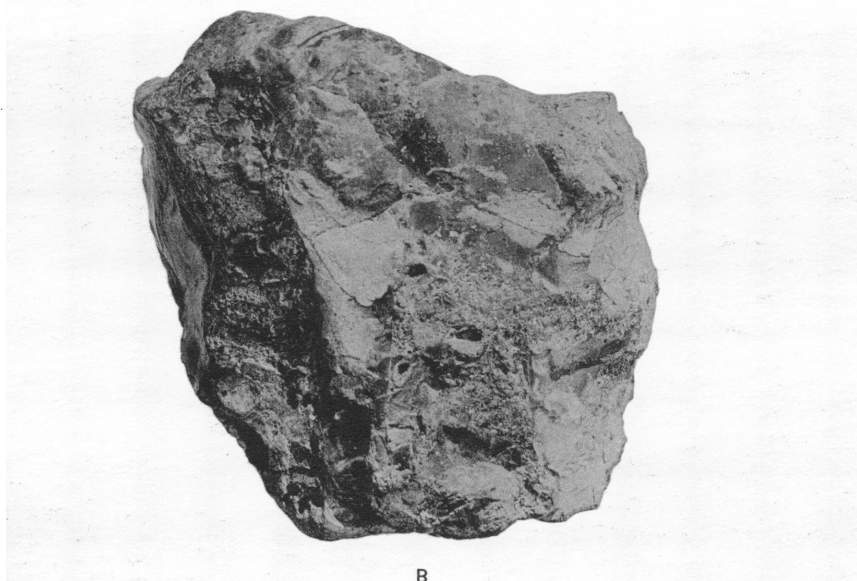
Projectile and knife points



Scrapers, discs, and perforator

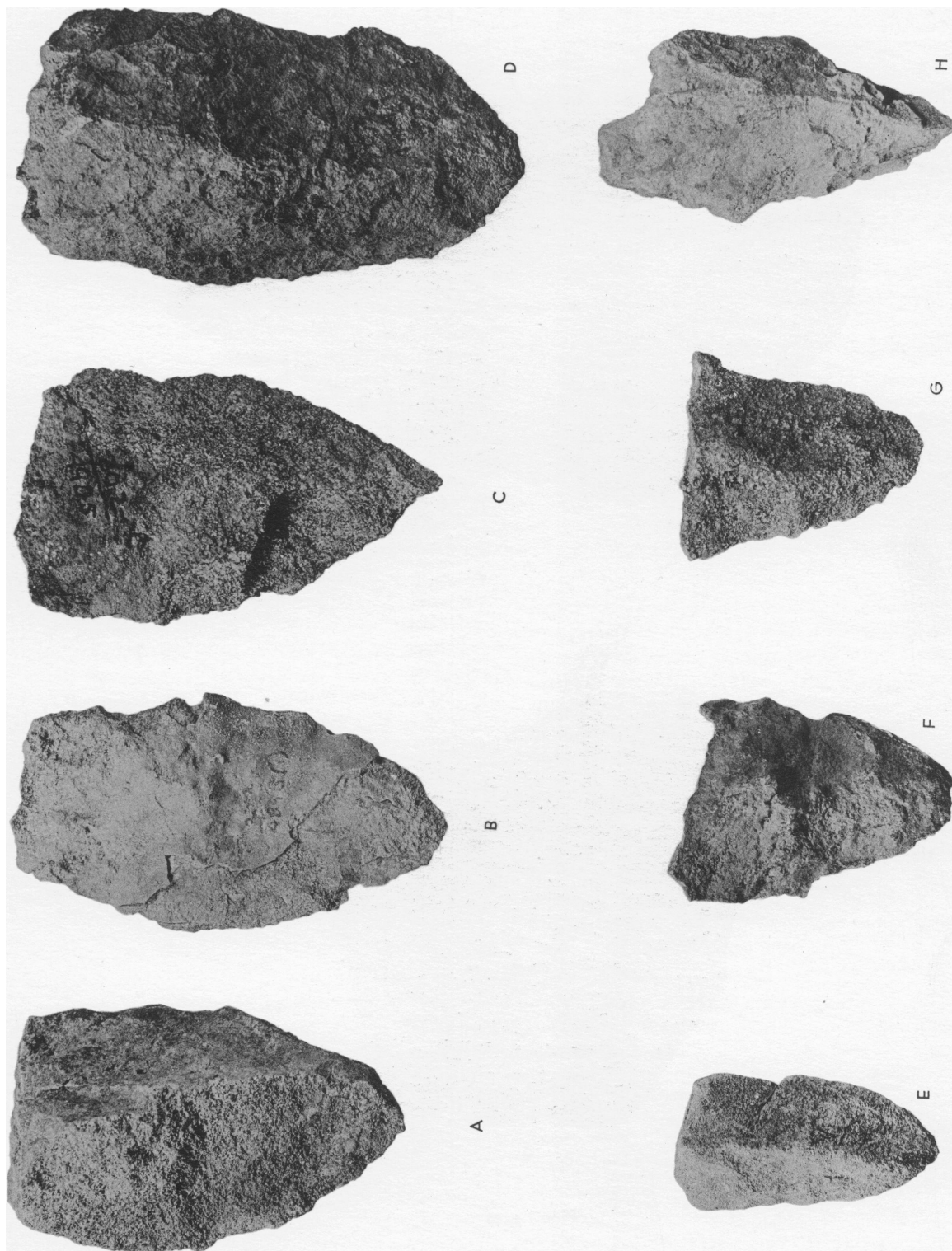


A



B

Hand axes



Limestone, chert, and quartzite blades

DESCRIPTION OF THE MATERIAL

POTTERY

STRATIGRAPHY: The first important feature about Bone Cave ceramics is the fact of sequential development in ceramic stratigraphy. The lowest level is pre-pottery. Sherds are rare in Level 3, relatively frequent in Level 2, and common in Level 1 (Table 1).

TABLE 1
FREQUENCY DISTRIBUTION OF ALL TYPES OF
SHERDS BY LEVELS

Level	Number of Sherds	Per Cent of Total
1	348	74.1
2	114	24.3
3	6	1.6
4	0	0.0
Total	468	100.0

The plastic materials used by the potters was, in all sherds save one, grit-tempered clay, unevenly fired, so that color is exceedingly variable in shades of gray to black and tan to reddish brown. The pottery is, without exception, unpainted and devoid of slip. Sherds range in thickness from a minimum of 0.5 mm. to a maximum of 18 mm.

CORD MARKING: Sherds are both plain and cord marked. Cord marking predominates in a ratio of 2.5 to 1 (331 cord marked : 137 plain). The ceramic materials are clearly associated with those of the Basic Woodland pattern. Stratigraphic breakdown reveals an increase of

cord marking from the middle to the upper level. In Level 2, the ratio of cord marked to plain sherds is 1 to 1 (54 cord marked : 60 plain). In the top level, the ratio is 3.6 to 1 (273 cord marked : 75 plain). Eighty-two and one half per cent of all cord-marked sherds fall in this level (Table 2).

RIM SHERDS: A total of 33 rim sherds were recovered. None occurred below Level 2. The average ratio of rim to body sherds is 1 to 13.1. Inasmuch as the ratios by levels are fairly constant for both cord-marked and plain types, it would seem safe to presume that the rim sections will provide a representative distribution of frequency of rim patterns.

FORMS AND TYPES: The variety of pattern of rim sections indicates a considerable inventory of vessel forms. A total of 19 different rim forms is indicated by the sherds (Figs. 2, 3). Considering that only 33 rim sherds were recovered, the range of form is impressive. However, the differences in a number of cases are limited to the shaping of the lip.

Because of the small size and scattered distribution of the sherds, it is not possible to effect the actual reconstruction of a single vessel, in whole or in part.¹

It may be seen from the rim sections shown in Fig. 4 that vertical or flaring necks, such as are characteristic of the Central Basin phase of the Basic Woodland pattern,² are rare. Only Types c and d (Fig. 4) seem to conform to the characteristic Central Basin designs. On the

¹ The majority are not more than 24 mm. in diameter. The largest is 90 mm. at its widest point.

² Deuel, 1935, Fig. 1.

TABLE 2
FREQUENCY DISTRIBUTION OF CORD-MARKED AND PLAIN SHERDS BY LEVELS

Level	Cord-marked		Plain	
	Number of Sherds	Per Cent	Number of Sherds	Per Cent
1	273	82.5	75	56.1
2	54	16.3	60	43.8
3	4	1.2	2	0.1
4	0	0.0	0	0.0
Total	331	100.0	137	100.0

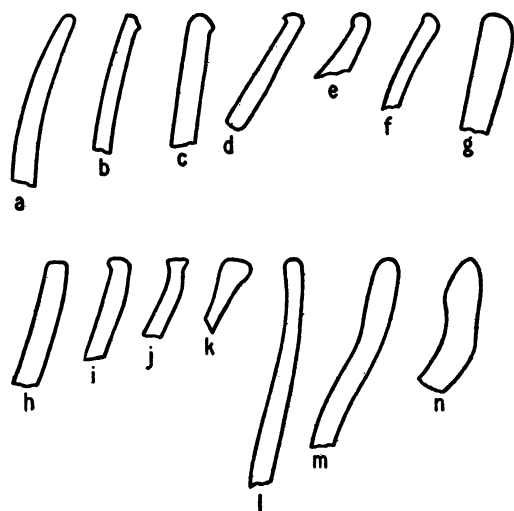


FIG. 2. Cord-marked rim sherds.

other hand, the predominance of constricting, or inward-sloping, necks and well-defined shoulders coincides well with the typical shapes of the Tampico phase, identified by Cole and Deuel.¹ Types a, b, e, f (Fig. 4) bear close, or identical, similarity to the typical Tampico shapes set up by Deuel.²

The frequency of the several Tampico types is predominant. Twenty-eight of the 32 identifiable rim sherds are of Tampico types. Nine separate vessels of Type b are represented by the rim sherds, making this the most common form of vessel. All sherds of the Type b forms were located in Level 1. The remainder of the Tampico type vessels are found in both Levels 1 and 2, but only nine of the 28 are from the lower level.

¹ Cole and Deuel, 1937, 195, note 157.

² Deuel, *op. cit.*, 438.

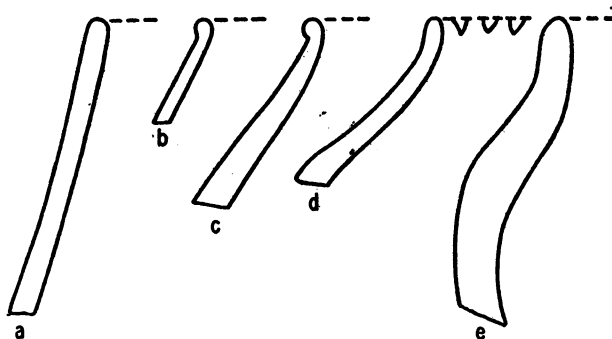


FIG. 3. Plain rim sherds.

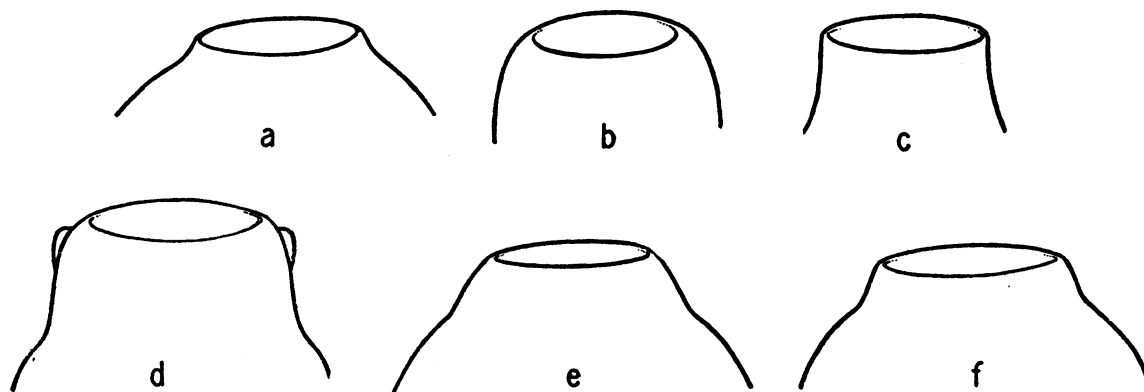


FIG. 4. Reconstructed rim and neck forms.

DECORATIVE FEATURES: Diagonal notches of single cords spaced approximately 5 mm. apart occur on the top surface of the lips of four rim sherds. In each case, the lip is flat and oriented parallel to the plane on which the pot would have stood. One of these sherds also has a fragmentary intaglio of an incised geometric design (Fig. 5); this is the sole example of decorative

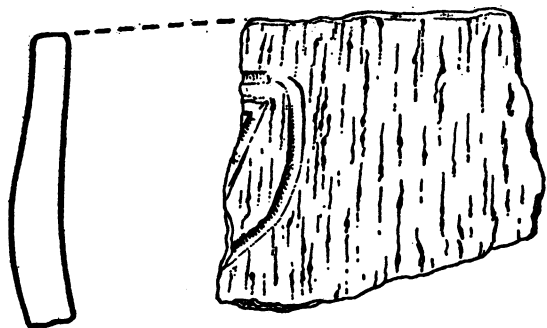


FIG. 5. Cord-marked sherd with intaglio design.

design on the wall of a vessel. One sherd (Fig. 3d) is notched by a series of small indentations around the inner surface of the lip. The ratio of decorated to undecorated lips is 1 to 6.6. Except for these limited features, there is no differentiation in decorative elements.

The over-all, surface cord marking is imprinted with the familiar cord-wrapped paddle. In some instances (Pl. 13, Figs. a, b) the imprints are carefully laid in vertical lines; in others, however, they are overlaid on each other in all directions. A few sherds are partially cord marked and partially plain.

LUGS: One rim sherd (Pl. 13, Fig. b) has a small lug at the lip of the rim. The lug is elliptical in cross-section, and its long axis is vertical.

EXCEPTIONAL SHERD: One shell-tempered body sherd, plain surfaced, with "greasy" feel, occurred in Level 1. It must be considered an intrusive element.

CERAMIC DISCS: Fragments of three ceramic discs were found in Level 1. These objects are made of the same grit-tempered clay as the pottery. They have plain surfaces. Two fragments are red-brown and one is black in color. The reconstructed diameter of two of the discs would be approximately 60 mm. The smaller disc is approximately 50 mm. in diameter. Each disc is perforated in the center with a hole 12 to 18 mm. in diameter. The thickness is 5 to 8 mm. Use of these discs is problematical.

PIPES

A single grit-tempered black clay pipe bowl, which appears to be a simple Woodland type elbow pipe, was found in Level 1. It was broken at the elbow, and the stem was not recovered. The bowl was 57 mm. long from base to lip. The neck was 30 mm. in diameter at the lips and tapered inward slightly toward the base. The diameter of the opening was 20 mm. The surface is plain and undecorated.

An interesting fragment of a probable pipe bowl occurred in Level 2. It is fashioned from a fine grade of even-textured white limestone, smooth and carefully polished (not to a high finish, however). The section of the fragment has a rounded and outward flaring lip. The reconstructed, external diameter of the bowl is approximately 45 mm. The internal diameter of the opening is 25 mm. The side walls slope gently outward. The piece is too fragmentary for accurate identification, but it has the appearance of a bowl segment of a Hopewellian-like platform pipe.

STONE ARTIFACTS

PROJECTILE POINTS: Forty-three identifiable projectile points were recovered from Levels 1, 2, and 3. They include Types I, II, and III of the familiar Cole and Deuel classification of Woodland pattern projectiles.¹ Specimens of the various subtypes are illustrated in Pl. 14. No Type IV (Mississippi pattern) points occur in Bone Cave. Type I (Basic Woodland), which consists of rather heavy, shouldered and barbed, stemmed points of medium size with a somewhat mediocre finish, predominates in Bone Cave (Pl. 14, Figs. b, c, e, f, i-l). They numbered 27 specimens, or 62 per cent of the total. Forty-seven per cent of the Type I points are from Level 2. Only one of these points is from Level 3. Three broken tips of Type I were found in Level 1 and five in Level 2. Stratigraphically, the Type I points correlate closely with the Woodland pottery.

The Type II point, which is identified with the Red Ochre phase of the Woodland pattern is "a lanceolate or leaf-shaped blade of medium width, with curved or truncate base. . . . The flake scars are coarse over the blade but moderately fine chipping is often found along the

¹ Cole and Deuel, 1937, 53-56.

edges."¹ The points of this type from Bone Cave have the same symmetry and finish that lead Cole and Deuel to compare Type II points of the Morton component in Illinois with the excellent artifacts from Solutré in France. Type II specimens are illustrated in Pl. 14, Figs. h and n. Type II points are relatively rare in Bone Cave; 5 specimens, plus a broken tip, were recovered. Three are from Level 3, and one each comes from Levels 1 and 2. The tip is from Level 3. Type II is, therefore, predominantly associated with the "pre-pottery" levels

the Marion-Ralls manifestations of the Red Ochre phase, these village sites are also "characterized by an absence of pottery."

The "pre-pottery" Type II projectile point of the Red Ochre phase clearly represents an early element of the Basic Woodland culture.⁴ The Bone Cave findings corroborate the Morton and Marion-Ralls results on this point.

An interesting feature of the Bone Cave artifact collection is the occurrence of a high proportion of medium-sized and small "lanceolate" points of the sort illustrated in Pl. 14, Fig. o.

TABLE 3
FREQUENCY DISTRIBUTION OF PROJECTILE POINTS

Form	Specimen in Pl. 13	Woodland Type	Number	Level			
				1	2	3	4
Contracting stem,* convex base, barbed, straight edges, small	a, d	III	5	2	3	—	—
Contracting stem, convex base, barbed, narrow	b, c	I	6	4	2	—	—
Expanding stem, barbed or rounded shoulders, broad	e, f, g	I	5	—	4	1	—
Contracting stem, convex base, notched shoulders, narrow	i, j, k, l	I	14	3	10	1	—
Expanding stem, large barbs, broad	h	II	1	—	—	1	—
Lanceolate, large	n	II	2	1	—	1	—
Lanceolate, small	o	IIa	8	2	5	1	—
Expanding stem, leaf-shaped head	—	I	2	—	2	—	—
Totals			43	12	26	5	0

* From the base toward the tip.

of the site. This fact also corresponds to the conditions of the Morton component of the Red Ochre phase, where only four sherds were found. It should be noted that the sherds from Level 3 at Bone Cave are the same grit-tempered materials as those of the upper level.² Morton component sherds, however, are tempered with crushed rock.

Eichenberger, in 1944, reported and illustrated a wide range in variety of barbed points of Type II from Marion and Ralls counties in northeast Missouri.³ Eichenberger's materials prove the variety of subtypes in Type II to be even wider than indicated by Cole and Deuel. Although Type II projectiles are numerous in

These appear to be a modification of the larger and thicker Type II points. Stratigraphically, they appear to be chronological successors to the Red Ochre Type II. Of the 8 points of this type found in Bone Cave only one is from the "pre-pottery" Level 3. Five are from the early pottery Level 2, and two from Level 1 (see Table 3). In general form and technique, they tie in with the Red Ochre lanceolates. Stratigraphically, they tie in with the Woodland pottery and Type I and III Woodland points. They definitely appear, at Bone Cave, to provide the stratigraphic cultural link between the Red Ochre and later phases of the Basic Woodland patterns, which Cole and Deuel could only tentatively suggest on the basis of the Fulton County data.

¹ Cole and Deuel, 1937, 55.

² Only six, or 0.1 per cent, of all pottery sherds were from Level 3.

³ Eichenberger, 1944, 10-11.

⁴ *Ibid.*, 64.

For classificatory purposes, these points require a separate category. Because of their typological similarity to Type II, it is proposed to group them under Type II, but because of their distinct position in the stratigraphic sequence, combined with their modified form, it is proposed herein that we call them Type IIa. The numerical importance of the Type IIa projectiles in Bone Cave and their apparent absence in Central Basin Woodland sites heretofore reported appear to indicate that the Level 2 component of Bone Cave should tentatively be classified as a distinct aspect. This possibility will be further discussed in our analysis and conclusion.

The Type III projectile points are conventionally held to be mediocre imitations by the carriers of Woodland culture of the finer Type IV projectiles associated with the Middle Mississippi culture. The inference is, of course, one of contemporaneity and borrowing. Type III points are relatively rare (7 in 43, or 16.2 per cent) in the Bone Cave group. Two of the seven are from Level 1, five from Level 2, none from Level 3. The imputed Mississippi influence may, therefore, be said to be limited and moderately late. It is interesting to note, however, that it is strongest in Level 2. Rather than increasing in significance, it declines in the later stratum (Level 1). Still, the small number of points involved precludes the attachment of any great weight to this observation.

KNIVES: An elongated type of knife occurs commonly in Level 1. It has a convex, curved, cutting edge, slightly convex dorsal edge, truncated or flat base, blunt point, and plano-convex cross-section with a distinct ridge off-center toward the dorsal edge (Pl. 14, Fig. m). The knife is of medium size, 75 by 30 by 13 mm. The flaking technique is similar to that which produced the Type I projectile points. The form is well standardized, with little variation. Of the six examples of this implement, five are from Level 1, one is from Level 2. It is a specialized artifact which made its appearance late in the culture history of the site.

SIDSCRAPERS: Sidescrapers are peculiarly rare in this site, for no more than three specimens were recovered. None of the three exhibits distinctive skill in production (Pl. 15, Figs. b, f, g). All are flake implements, unworked on the dorsal surface. Primary flaking on the ventral surface is rough and unretouched along the

sharp center ridge. The convex edges along the sides, however, are finely retouched. The sidescrapers shown in Pl. 15, Figs. b and g, have

TABLE 4
FREQUENCY DISTRIBUTION OF PROJECTILE POINTS
BY TYPE AND LEVEL

Level	Type			
	I	II	IIa	III
1	8	1	2	1
2	5	1	5	5
3	1	3	1	—
4	—	—	—	—

thick, transverse butts, which bear no marks of having served as striking platforms. These small scrapers measure 45 by 35 mm. Both are from Level 2.

The specimen shown in Pl. 15, Fig. f, is somewhat larger (60 by 43 mm.). It has the appearance of a lanceolate point with a truncated tip. Nevertheless, the fact that it is unworked on the dorsal side definitely distinguishes it as a scraper. Further, the back edge (i.e., that opposite the retouched scraping edge) is flat and 5 mm. wide. It is unretouched, retaining the original patina crust of the nodule.

CONCAVE SCRAPERS: Three concave scrapers or "shaft scrapers" (Pl. 15, Figs. d and e) were recovered. These are flake tools, produced by the removal of a few elongated flakes, extending downward from a distinct striking platform at the butt. The dorsal surface is unworked. The convex scraping edge is sharpened with a fine retouch. All three specimens are from Level 1.

CARINATE ENDSCRAPERS: Three "fleshers," or carinate endscrapers, were recovered. Each is distinctly different from the others. The specimen illustrated in Pl. 15, Fig. j, is a "tortoise back" in shape. It is slightly ellipsoid in form, when viewed from above (38 by 27 mm. along the axes). It is formed from a flake 11 mm. thick. The primary flaking is rough and unretouched in the center of the artifact and at the butt. The steeply sloping planing edge is skilfully retouched and well shaped, however. This implement is very similar in appearance to the carinate scrapers of the French Aurignacian. It was found in Level 1.

One specimen (Pl. 15, Fig. a) is worked only

on the planing edge. The butt, or grasping end, is the curved outside edge of the nodule, with the original patina intact. This artifact is from Level 2.

The third example of this type is rough and unfinished, 64 mm. long by 35 wide and 29 mm. thick.

Discs: The inventory includes two chert discs (Pl. 15, Figs. h, j). Specimen h is a beautifully executed artifact in cream-colored chert. It forms an almost perfect circle, 38 mm. in diameter and 7 mm. thick. Its beveled edges are formed by the retouch removal of narrow flakes, many of which extend across the entire thickness of the edge. The ventral surface is unworked. This artifact, from Level 1, is unpatinated. Its unusual color and the texture of the material, which are unlike that of other artifacts, suggest that it is an intrusive trade article.

The second disc (Pl. 15, Fig. i) is larger (64 mm. diameter; 13 mm. thick). It is irregular in shape and the retouching is not well controlled. The specimen, which is from Level 2, is heavily patinated.

PERFORATORS: Two perforators, or awls, were found in Level 1. One (Pl. 15, Fig. c) is a purposefully prepared artifact of the familiar Woodland type. It was approximately 75 mm. long and 45 mm. across the body. The tapering drilling shank is 35 mm. long. The second specimen (not shown) is constructed from an irregularly shaped flake, which has been retouched to a very sharp point.

CHERT HAND AXES: Three probable hand axes were recovered. One (Pl. 16, Fig. a) is a large, pointed implement roughly similar to the crude *coup de poing* of the Early Chellean in France. It measures 140 mm. by 85 mm. by 63 mm. A roughly rounded fist-size hand grip extends half its length. From the mid point, the sides converge to form a sharp point. The dorsal surface is flat, but chipped. The convex edge extends back in a gradual bevel formed by gross retouching. The opposite edge forms a vertical wall. The material is brown and cream chert. The artifact was located in Level 1. A large (83 by 70 by 65 mm.), block-shaped hand ax (Pl. 16, Fig. b) is roughly flaked. The beveled chopping edge is crudely retouched. The material is the same as above. Its location was Level 2. The third hand ax (not illustrated) is an oblong block (120 by 70 by 25 mm.) of white and

gray chert, with a retouched beveled edge extending its entire length. Location: Level 2. The diagnostic significance of these artifacts is uncertain. However, they do not seem to be typical of the Woodland pattern, so far as published reports indicate (negatively).

LIMESTONE AND QUARTZITE PROBLEMATICALS: Eight problematics that may have been used as hoes or picks were recovered in Levels 1 and 2 (five in Level 2, three in Level 1). All are crudely made, but the pattern is definite (Pl. 17). They are fairly large, being 75 to 100 mm. long and 50 to 65 mm. wide. They have a truncated leaf shape and rounded or sharp points. The edges do not show signs of heavy wear; if these were used as digging implements, it must have been in the soft black soil of the bottomlands. No grooving is visible on these artifacts. A slight notching is apparent near the base of the edges of most of the specimens. Whether this is intentional or accidental cannot be determined. It is possible, but not very probable, that these artifacts were transversely hafted. It is interesting that these crude artifacts are stratigraphically from the more recent pottery levels.

There is no report of similar artifacts from other Woodland sites. Dr. Edward Krieger, who has viewed these materials, informs me that similar artifacts have been recovered in Texas. Tentatively, we may consider an intrusive influence from the south as a source of this manifestation.

ABRASION OR POLISHING STONES: Two quartzite pebbles, approximately 75 mm. in diameter, abraded flat and polished by use of the flat surface, occurred in Level 1.

ANVIL STONE: A square quartzite block (100 by 100 by 50 mm.) with a shallow center pit occurred in Level 1.

BONE AND HORN ARTIFACTS

Bone artifacts are relatively uncommon in the Woodland culture. The Bone Cave components are in accord with this generalization. Four bone artifacts were recovered, all of which are shown in Pl. 13, Figs. c-f. Three awls of split and sharpened bone were found. Two from Level 2 and one from Level 1 (Pl. 13, Figs. c, d) are 100 mm. long, with sharp, fine points. The specimen in Pl. 13, Fig. e, is 65 mm. long. It has a blunt point and is highly polished, with deep, longitudinal scratches. A problematical

pin, comb, or scratcher fashioned from the quarter-section of a bone 66 mm. long is shown in Pl. 13, Fig. f. It has two prongs (one broken) 25 mm. long. The top is carefully rounded, and the whole object is highly finished.

A fragment of worked and polished antler (?) tip, which may have been used as a flint working tool for pressure flaking, came from Level 2. Its rounded blunt end shows cutting or pressure scars.

SPECIAL FEATURES

Two rock structures of probable ceremonial significance lay directly in the front of the cave entrance 20 inches below the surface of the floor. Cairn 1 was located at the intersection of grid Lines A and 4. The cairn was formed of two layers of waterworn fist-size river rocks arranged in

lozenge pattern. The long axis was 20 inches long; the short, 13 inches across, intersecting the long axis 6 inches from the nearest end. The most interesting aspect of the structure was that it pointed due north along its long axis. This orientation bears no relation to any discernible feature within the cave. Presumably, therefore, it is a directional orientation. A number of clam shells lay immediately above the cairn, which rested on a solid ash level. Otherwise, there was nothing else to be noted about it.

Cairn 2 was located on exactly the same median line of the floor and on the identical level. It was exactly similar to No. 1 in size and form and its due north orientation. This cairn, however, was made of limestone blocks, not of river stones.

CONCLUSIONS

THE EXCAVATED LEVELS of Bone Cave indicate that it was occupied by carriers of the Basic Woodland culture from its early phases to a middle phase. No other culture pattern was present in the levels excavated. Within the Woodland culture manifestations in Bone Cave

materials are found in the Missouri Valley as far west as Kansas City.¹ Chronologically, therefore, the occupation of Bone Cave stopped short of the Upper Woodland.

The Bone Cave sequences, therefore, should probably read as follows:

LEVEL	FOCUS	ASPECT	PHASE	PATTERN
1	Bone Cave	?	Tampico	Woodland
2	?	?	Central Basin (?)	Woodland
3	?	?	Red Ochre	Woodland

three stratigraphic components are delineated.

Level 3 presents a component almost devoid of pottery. Its yield of Type II projectile points identifies it as a component of the Red Ochre phase of the Woodland culture. Chronologically this is exceeded in established antiquity among the Central Basin Woodland phases only by the Black Sand phase of Fulton County, Illinois. This level is, therefore, early Woodland, although not the most ancient Woodland phase known in the Mississippi drainage.

Level 2 yields typical Woodland pottery in which plain and cord-imprint sherds are of equal frequency. Although a few vessel forms typical of the Central Basin phase of the Woodland culture are indicated, the rim sections suggest a trend toward types associated with the Tampico phase of the Woodland culture. This Tampico affinity is definitely dominant in Level 1 and is thus clearly characteristic of the Bone Cave pottery manifestations.

Because the Tampico phase is as yet ambiguously defined in the literature of Woodland archaeology, the confirmation of the reality of the Tampico complex in the Bone Cave materials is of contributory significance. Further, it appears that Bone Cave is the westernmost location yet reported for the occurrence of the Tampico phase. The presence of Type IIa projectile points, as we have identified them in this report, leads to the tentative conclusion that the Bone Cave component represents a hitherto unreported focus, or possible aspect, of the Tampico.

None of the higher Hopewellian-type traits of the upper Woodland phases are present in the Bone Cave yields, although Hopewellian

It is highly probable that the Bone Cave dwellers also produced the numerous rock burial cairns on the ridge tops in the vicinity. Griffin² and others have reported that northeastern Missouri village sites of the Woodland pattern are culturally associated with the stone vault graves and crypts in the earth mounds and stone slab mounds of central Missouri.

Most of the burial cairns in Miller County have been destroyed or scattered by relic hunters. A systematic survey would, however, very likely reveal some undisturbed cairns. One small, undisturbed cairn on the farm of Mr. George Stanton was opened by the expedition. It lay 3 miles southeast of Bone Cave on a high bluff overlooking the Glaize. An occupied cave, which we had sounded but not worked, was situated immediately below it in the bluff. The cairn rested on a shelf of limestone outcrop. It was less than 2 feet high in the center, was ovoid in shape, with diameter dimensions of 8 by 10 feet. The rocks used in its construction were unprepared limestone slabs, none of which were more than a foot in diameter. No masonry was involved in the construction; the rocks were simply piled in a heap.

The burials in this cairn were secondary interments of the skulls of five individuals, so badly crushed that reconstruction was not attempted. The skulls were not nested in the cairn, but simply dropped at random throughout its middle area. The main burial consisted of a skull accompanied by the long bones of the body laid out in their approximate normal ex-

¹ Shippee, 1941, 29.

² Griffin, 1941, 3.

tended position. No other parts of the skeleton were included in this re-burial.

No cultural remains of any sort were found in the cairn. It is not yet possible, therefore, to link the rock cairns to the Bone Cave cultures as an established fact.

Ironically, although Bone Cave received its name from the local tradition of a "great" number of skeletons reputed to have been found lying on the surface of the cave floor when it was first discovered, and although the owner of the cave dug up one or more skeletons from within the deposits ("A whole bushel basket full of bones; they were so thick you could hear the shovel go crunch every time I put it in"), no definitely human skeletal materials were found in the excavated area except an isolated human astragalus.

It is interesting to note, in analyzing the cultural affiliations of Bone Cave, that the culture represented in its excavated areas falls into a different province from the cultures of the caves in the southwestern part of the state. The best known of the southwestern Missouri cave sites is Jacob's Cavern, McDonald County, Missouri. This location was excavated in 1902-1903 by Charles Peabody and W. K. Moorehead,¹ in 1921 by Clark Wissler and V. C. Allison,² and in 1923 by Nels C. Nelson.³ The Jacob's Cavern artifacts are in general the product of a cruder flint-working technique than those of Bone Cave, and they do not fit into the Woodland culture complex. Pottery is almost totally absent in the Jacob's Cavern deposits; the few recovered sherds are plain, of shell-tempered clay. This is also a non-Woodland characteristic. All in all, the Jacob's Cavern materials give the impression of greater primitiveness than those of Bone Cave. On the basis of his stalactite analysis, Allison claimed an antiquity of nearly 20,000 years for the lower levels of the culture-yielding deposits in Jacob's Cavern. This may be extreme, but his evidence supports the impression that the Jacob's Cavern culture antedates that of Bone Cave in antiquity. It should tentatively be considered as pre-Woodland.

¹ Peabody and Moorehead, 1904.

² Allison, 1926.

³ The collection of materials gathered by Nelson is deposited in the American Museum of Natural History.

The same may be said of the culture of the Rockhouse Cave site near Monett, in southwest Missouri, as reported by Lee Adams in 1941.⁴ So far as can be determined from Adams' limited report, the Rockhouse Cave artifact complex is similar to that of Jacob's Cavern. Pottery is also extremely rare in this cave, and all of the 16 recovered sherds are shell-tempered, as were those of Jacob's Cavern.

It is not possible on the basis of the limited preliminary report by M. R. Harrington on the Heye Museum excavations of Ozark rock-shelter sites in Arkansas⁵ to tie in the Bone Cave culture with that of the so-called Bluff-dwellers. Since the pottery and stone artifacts of the Bluff-dweller culture are unrelated to the Woodland complex, they are therefore distinct from those of Bone Cave. Harrington has given the opinion that the Arkansas Bluff-dweller complex with its basketry, atlatls, ceramic types, and agriculture has its affiliations with the Southwest.

The proximity of Bone Cave to the two southwest Missouri cave sites (approximately 100 miles) suggests the possibility that a component of the Jacob's Cavern culture may well underlie the Woodland strata in Bone Cave. It must be reemphasized that our operations penetrated only through the topmost 4 feet of deposits to a sterile red-clay level, which was unworkable under the wet conditions of the 1943 season and the labor shortage which limited the scope of our activities. By estimate, at least 6 to 8 feet of deposits underlie the levels which we worked out. The probability that culture-bearing levels underlie the sterile red clay that stopped us is certainly great. Whether the more deeply underlying levels will yield a component of the Jacob's Cavern culture or other cultures of greater antiquity remains to be seen.

In conclusion, the fact that Bone Cave has yielded early and middle phases of the Woodland culture in a stratigraphic continuity, with the promise of older cultures yet to be exposed, indicates that Bone Cave should without fail be explored to its very floor.

⁴ Adams, Lee, 1941.

⁵ Harrington, 1926.

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EXPLANATION OF ILLUSTRATIONS

PLATES

13. Rim sherds and bone artifacts
 - a. Cord-marked sherd, Section B4, Level 1 (20.2-4809d)
 - b. Cord-marked rim sherd, Section B1, Level 1 (20.2-4852a)
 - c. Bone awl, broad, Section B1, Level 2 (20.2-4876)
 - d. Bone awl, slender, Section B1, Level 2 (20.2-4877)
 - e. Bone awl, Section Y4, Level 1 (20.2-4931a)
 - f. Polished bone with two prongs, one broken, Section X5, Level 2 (20.2-4920x)
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 - b. Type I, Section B1, Level 2 (20.2-4869)
 - c. Type I, Section B4, Level 1 (20.2-4802)
 - d. Type III, Section A4, Level 1 (20.2-4753)
 - e. Type I, Section B1, Level 2 (20.2-4860)
 - f. Type I, Section A5, Level 2 (20.2-4790)
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 - h. Type III, Section B5, Level 3 (20.2-4832)
 - i. Type I, Section B1, Level 2 (20.2-4859)
 - j. Type I, Section B1, Level 2 (20.2-4857)
 - k. Type I, Section A4, Level 1 (20.2-4754)
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 - b. Sidescraper (?), Section B1, Level 2 (20.2-4872l)
 - c. Perforator, Section B5, Level 1 (20.2-4817)
 - d. Concave scraper (?), Section B5, Level 1 (20.2-4820a)
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 - b. Section Y4, Level 1 (20.2-4929j)
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