



# Life 8,000 Years Ago Uncovered in an Alabama Cave

A NATIONAL GEOGRAPHIC SOCIETY-SMITHSONIAN INSTITUTION EXPEDITION  
ALSO REVEALS THE 4,000-YEAR-OLD SKELETON OF A CAVE MAN

By Carl F. Miller, Expedition Leader

**M**ORE than 3,000 years before the building of the Great Pyramid of Egypt, the fires of Stone Age men flickered in a cave in Alabama.

This we now know as a result of excavations under the joint auspices of the Smithsonian Institution and the National Geographic Society which thus far have reached the 14-foot level in a limestone cave on a farm in the northeast corner of the State.

### An Archeologist's Dream Come True

Man-made charcoal found there has been tested by the radioactive carbon 14 method and has proved to be approximately 8,000 years old—the oldest material of human origin yet tested from the southeastern United States.

Specifically the test indicates an age of 8,160 years, plus or minus 300. A human skeleton found at the 6-foot level—and also the bones of a dog—are about half as old.

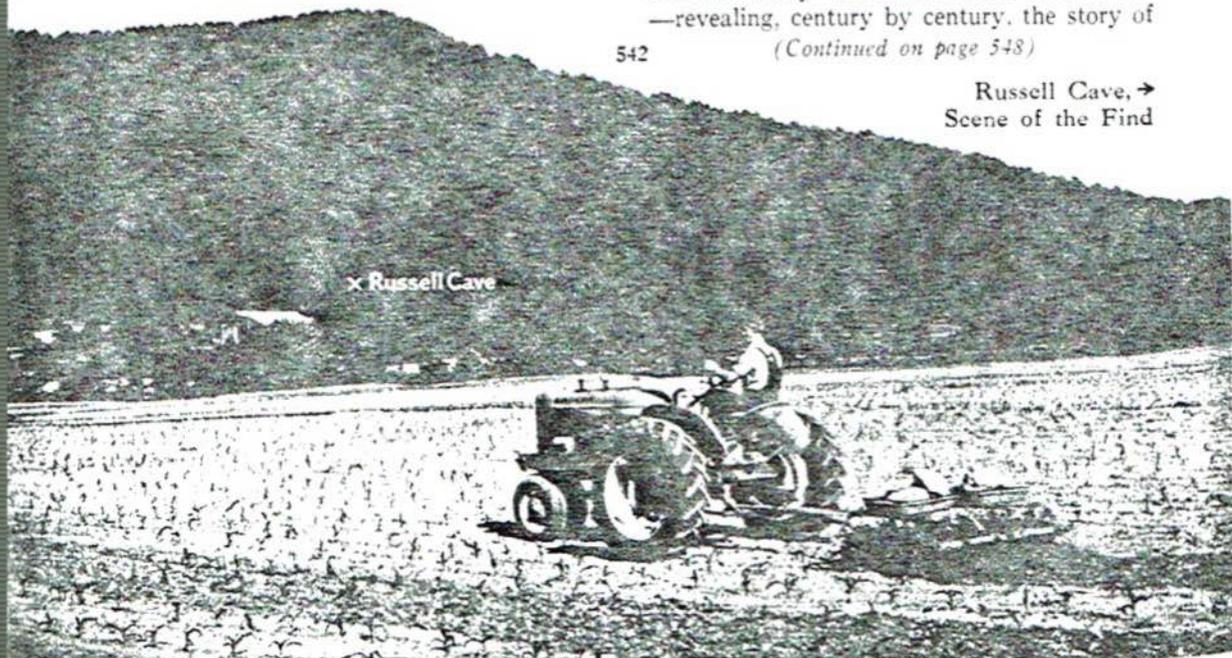
As an archeological site the cave is in many respects unique on this continent. No other site has revealed so detailed a record of occupancy for so long a period—from 6200 B. C. or earlier until about A. D. 1650. Its contents—bones, tools, weapons, and implements—have lain buried for thousands of years, protected from rain, wind, erosion, silting, and flood. They lie where the occupants left them, layer upon layer, a record as easy to read as the tree rings in a giant sequoia.

These layers, clearly visible in the cross section of our excavation, provide us with a slice of history—an archeological book of life—revealing, century by century, the story of

(Continued on page 548)

542

Russell Cave, →  
Scene of the Find



35 feet to Earth's surface

Roof

### NORTH WALL in CROSS SECTION



Landing of the Pilgrims

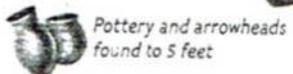
Time Scale  
A.D. 1620 — A.D. 1650 Last date of Indian occupation



Present cave floor

Scale in feet

A.D.  
↑  
Birth of Christ  
↓  
B.C.



Pottery and arrowheads found to 5 feet



Human skeleton

Great Pyramid of Egypt  
2600 B.C.  
Sumerian cuneiform writing  
3000 B.C.



stone slabs  
Fallen arrowhead



Remains of stone weight used on atlatl, a spear-throwing device (shown at left)

6000 B.C.

Deepest level uncovered (Date established by carbon 14 test of charcoal from ancient campfires)



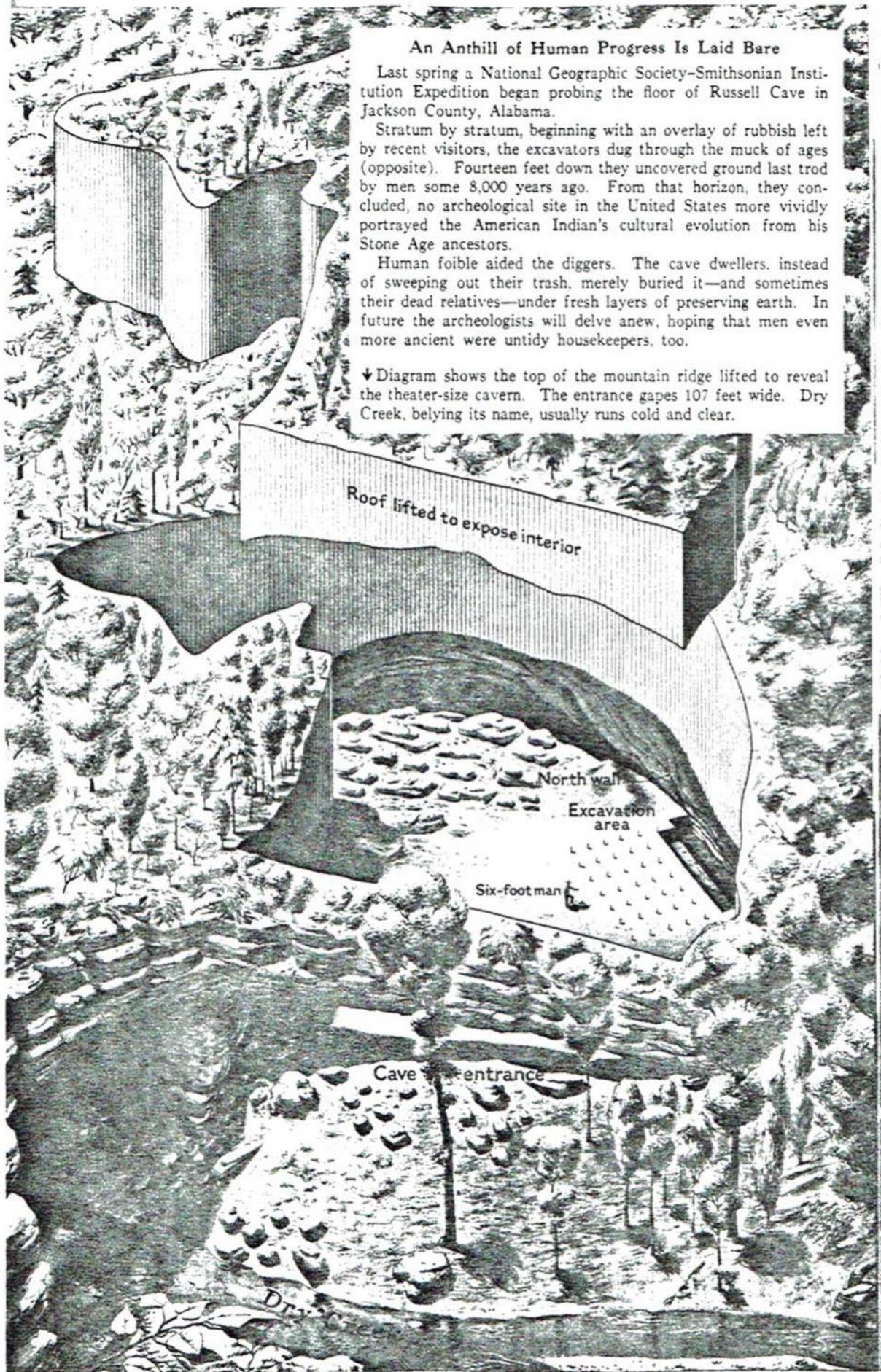
### An Anthill of Human Progress Is Laid Bare

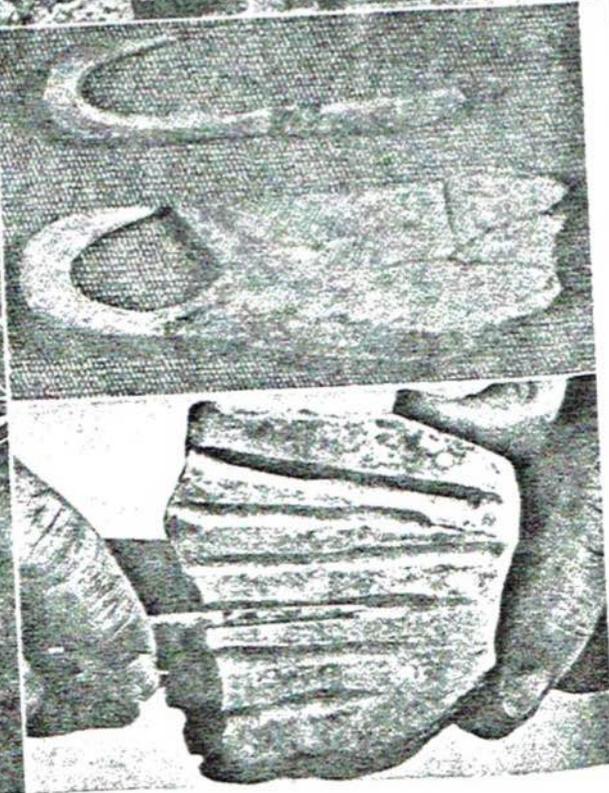
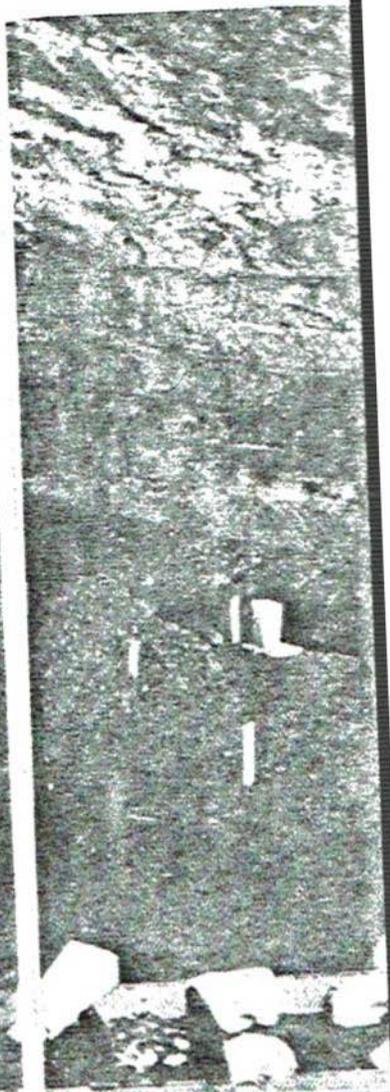
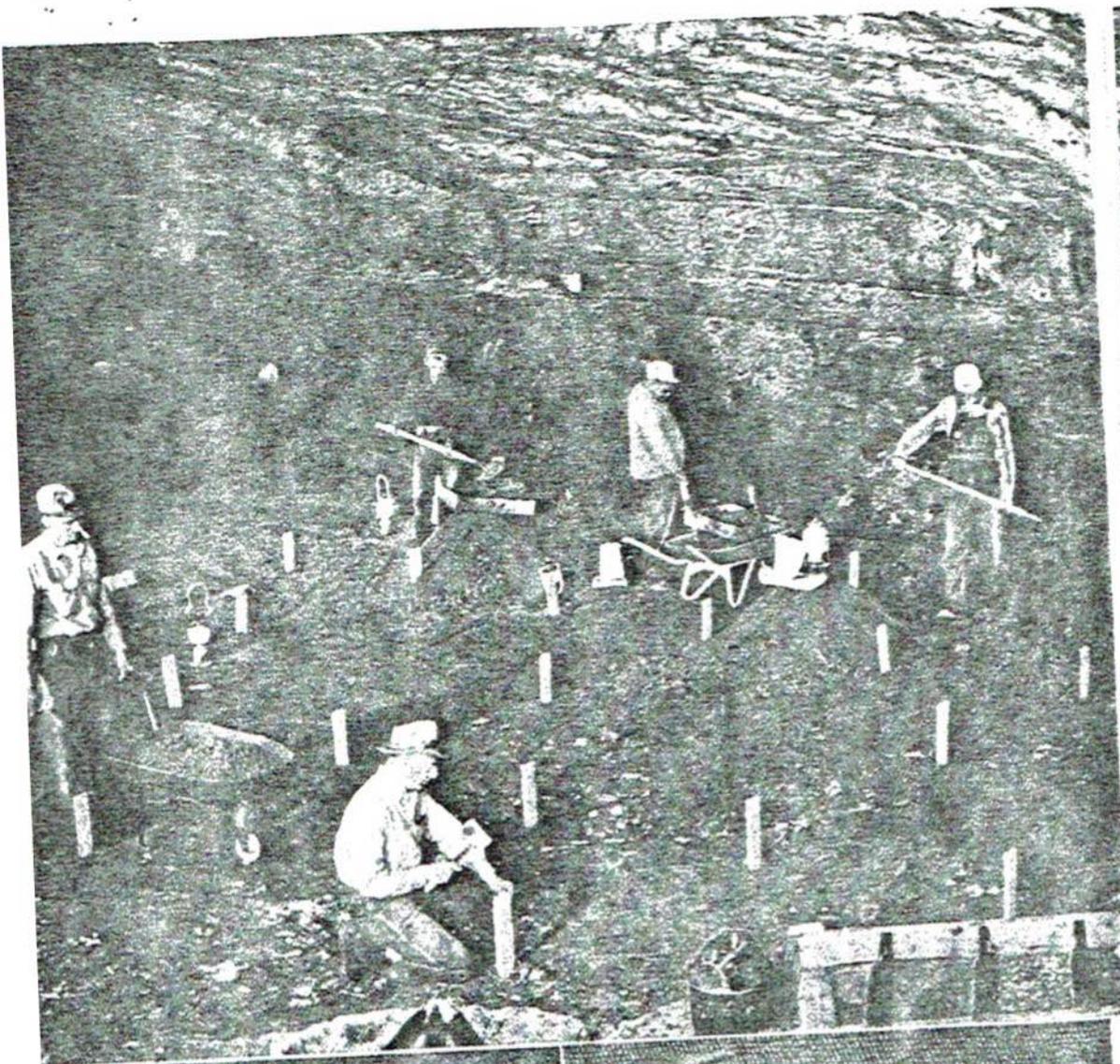
Last spring a National Geographic Society-Smithsonian Institution Expedition began probing the floor of Russell Cave in Jackson County, Alabama.

Stratum by stratum, beginning with an overlay of rubbish left by recent visitors, the excavators dug through the muck of ages (opposite). Fourteen feet down they uncovered ground last trod by men some 8,000 years ago. From that horizon, they concluded, no archeological site in the United States more vividly portrayed the American Indian's cultural evolution from his Stone Age ancestors.

Human foible aided the diggers. The cave dwellers, instead of sweeping out their trash, merely buried it—and sometimes their dead relatives—under fresh layers of preserving earth. In future the archeologists will delve anew, hoping that men even more ancient were untidy housekeepers, too.

↓ Diagram shows the top of the mountain ridge lifted to reveal the theater-size cavern. The entrance gapes 107 feet wide. Dry Creek, belying its name, usually runs cold and clear.







### Diggers Sift the Sands of Time; Stakes Tell Them Where to Work

A vaulted wall, deeply grooved by subterranean waters, overhangs the archeologists' main trench. The ladderlike contrivance separates artifacts by age groups.

← Page 546, lower left: Claud Holloway unearths the skeleton of a 5-foot-2 Indian who died about 2000 B.C. and was buried doubled up on his side.

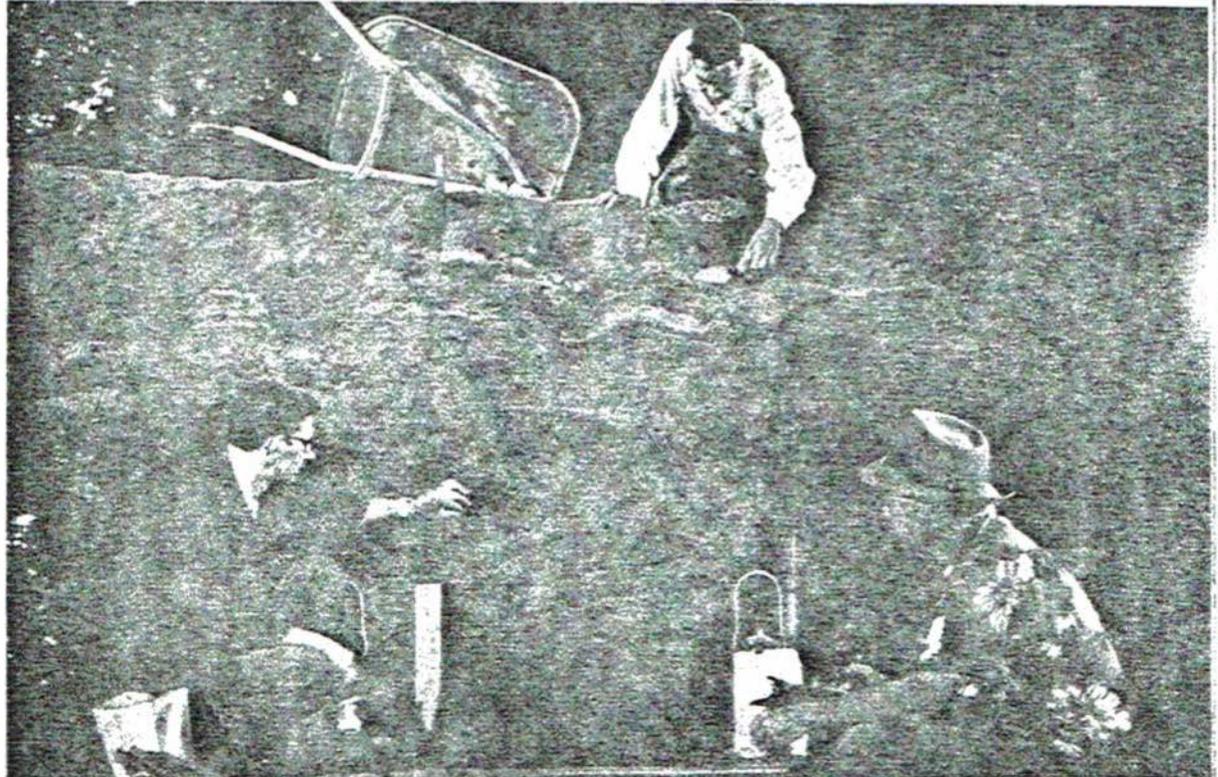
Right, above: Prehistoric men, making 1½-inch fishhooks from the toe bones of deer, failed to complete the lower one. Below: Cave dwellers sharpened bone awls on this sandstone hone. Grooves shaped the points to various sizes.

### ↓ Wavy Lines Mark Former Floor Levels

Author Carl Miller (right) inspects a 6-foot cross section spanning some 4,000 years. Dipping strata lines indicate fire pits dug long ago and covered. Bits of charcoal, vital for age tests of radioactive carbon 14, form black specks in the wall. Carbon analysis reveals the age of the earliest explored level as 8,160 years, plus or minus a 300-year margin of error.

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547



Middle Woodland  
A.D. 500



Late Woodland  
A.D. 1100

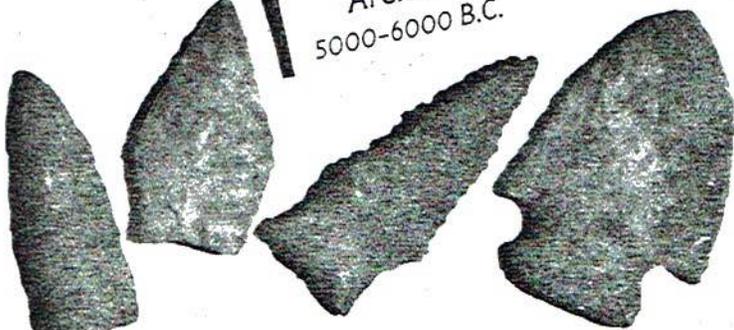
Mississippian  
A.D. 1600



Early Woodland  
1000 B.C.



Archaic  
5000-6000 B.C.



Early Archaic  
6000 B.C.



548 Willard R. Culver, National Geographic Staff

### Weapon Tips Found in the Cave Span 7,600 Years

Before 1000 B. C. the bow was unknown to Indians. Only the two small points near the top belonged to arrows. Other heads in this collection were made for spears and knives. All were chipped from chalcedony.

man in this part of America.

Here many generations of cave men squatted and chipped out stone weapons and bone tools and wove baskets of grass. They hunted animals in the woods near by and cooked them on fires under this rock roof. And here they slept at night around their fires, protected by the stone walls from cold and enemies.

Since digging began last May Day, we have uncovered literally thousands of primitive stone, bone, shell, and pottery objects. Interspersed with tools, ornaments, and weapons are the ashes and charcoal from the fires the cave men built.

### How It All Began

As so often happens with archeological sites, Russell Cave was first brought to the attention of the Smithsonian Institution by amateurs.

In 1951 Mr. Paul H. Brown, a civil engineer with the Tennessee Valley Authority and an amateur archeologist, heard from a friend in charge of a power-line survey crew about projectile points that had been found along their route. He asked his friend to point out the sites on a map.

Studying the map, Brown noticed that it showed the existence of a cave not far from the Indian sites. It occurred to him that the cave, if habitable, might be a good place to dig for relics.

Two years passed before Brown had a chance to visit the cave. When he did, he took along a fellow member of the Chattanooga Chapter of the Tennessee Archaeological Society. Later they got the

permission of Mr. Oscar Ridley, owner of the farm on which the cave lies, and started digging.

They were astonished and delighted. The first few feet of earth dug from the cave floor were an archeological treasure trove filled with a profusion of stone points, bone tools, pottery, and shell ornaments. Suspecting they had made a major discovery, they showed the artifacts to Dr. Matthew W. Stirling, Director of the Smithsonian's Bureau of American Ethnology.

By good luck, I had an archeological assignment in near-by Tennessee about this time. At Dr. Stirling's request, I drove to Bridgeport and met Paul Brown and some of his men to the cave, which

### Cave Cooled by Nature

I remember my first sight of the cave, where Stone Age man lived. This was it.

Russell Cave stands dry in a cliff by the side of a mile-long valley known as the Stone Age valley. 107 feet across the east and the cave curves 270 feet in a tight turn. Most of its floor is inaccessible by walking on the valley floor. Best of all, the cave is naturally air-conditioned.

Actually, Russell is two caves which gape side by side, one above the other, which tunnels down to the valley floor. It is uninhabitable because the cave floor is covered most of its floor. The cave emerges from the mountain side a few miles away.

\* See, in the NATIONAL GEOGRAPHIC, "Indians of the Southeast," January, 1946; and "America's First Indians," November, 1937, both by Paul H. Brown. See also THE SOCIETY'S new book, INDIANS OF THE ATLANTIC COAST, \$7.50 in the United States, \$8.50 elsewhere. Postpaid.

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By good luck, I had an archeological assignment in near-by Tennessee at about this time. At Dr. Stirling's request, I drove to Bridgeport and met Mr. Ridley and Mr. Brown and some of his colleagues. They led me to the cave, which lies beside a cornfield.

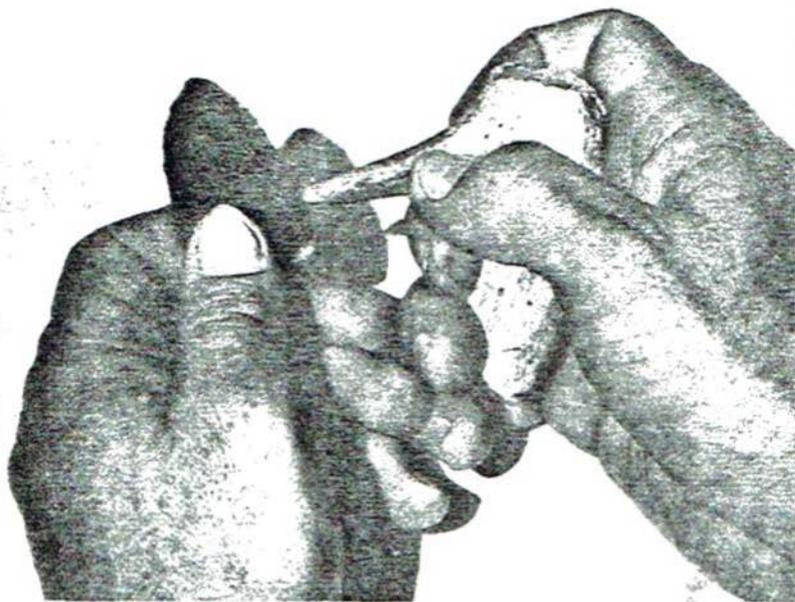
#### Cave Cooled by Natural Air Conditioning

I remember my growing excitement at the first sight of the cave. If there was a place where Stone Age cave men *ought* to have lived, this was it.

Russell Cave stands high and relatively dry in a cliff by the side of a pleasant five-mile-long valley known as Doran Cove. Its mouth, 107 feet across and 26 feet high, faces the east and the morning sun. The cave curves 270 feet into a limestone mountain. Most of its floor is level and smooth, accessible by walking up an easy slope from the valley floor. Best of all, the cave is naturally air-conditioned.

Actually, Russell is the smaller of two caves which gape side by side in the cliff face. The other, which tunnels deep into the mountain, is uninhabitable because a stream, Dry Creek, covers most of its floor. This same stream emerges from the mountainside about two miles away.

\* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Indians of the Southeastern United States," January, 1946; and "America's First Settlers, the Indians," November, 1937, both by Matthew W. Stirling. Also see The Society's new book, *National Geographic on INDIANS OF THE AMERICAS, A Color-illustrated Record*, 1955 (second printing now available, \$7.50 in the United States and U. S. possessions; elsewhere \$7.75. Postpaid).



549

Brooks Honeycutt

#### Deer Antler Chips Flint to a Deadly Point

Primitive men split flakes from large pieces of flint with hammerstones and then shaped the edges with bone tools. Scientists at the Smithsonian Institution have learned how to duplicate the process.

A fissure at the rear of Russell Cave connects it with this enormous water-cooled cavern, and through the hole, by natural convection, runs a constant stream of chill air.

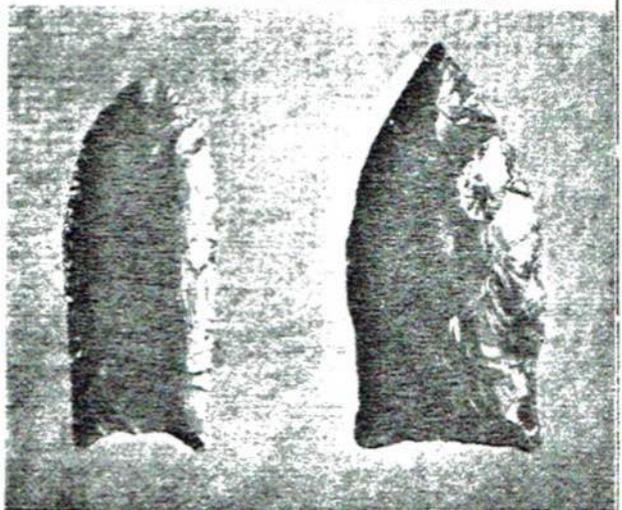
When I entered the cave, I saw that Paul Brown and his friends had dug a series of small pits, one of which was six feet deep, but that the fill—that is, the material deposited since human occupancy began—apparently ran a great deal deeper. Just how deep it was impossible to tell.

From an inspection of the cavern and some

#### Two Spearheads Show How Skill Ebbed

Folsom man, nomad of the Ice Age, fashioned the fluted point at least 10,000 years ago. Alabama Indians made the other 2,000 years later. Most workmanlike of all the points found in Russell Cave, it cannot compare with the Folsom artifact. Folsom levels have not been reached in the cave.

Volkmar Wentzel, National Geographic Staff





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550

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### Gasoline Lanterns Cut the Stygian Gloom; Man's Ancient Works Come to Light

Coal miners became enthusiastic archeological workers. The author marveled at their skill in dynamiting boulders without bringing down the roof. Paper bags on the cave floor hold spearheads, awls, and stone knives.

Life 8,000

of the artifacts it had yielded was a promising site in fact as any I had ever seen. I enthusiastically to Dr. S. I described the discovery to the committee of the National

#### Society Grant Permitted

With a National Geographic Society grant, we returned to Russell Cave. The Society also sent a photographer, Brooks Honeycutt, to record the work.

Our first jobs were to clear the digging and to choose the area to excavate.

We were fortunate in having some experienced coal miners from Pittsburg, Tennessee, who knew mining coal are far more experienced than we were through.

As for choosing an area to dig, we selected a site on the north wall, 60 feet back from the entrance. We picked this spot for several reasons. Primarily we chose it because it was far enough back to be relatively free of large stones.

#### Treasure Appears

With a crew of seven men, we began actual digging at 7:30 a.m. From the first turn of the shovel, the cave began to yield its treasures.

The first day of digging yielded the first thin layers of fill, which were back more than 300 years old. At the very top of the cave floor, we found rubbish left by recent white men, traces of any white man's work. We assumed that the top layer must date from about 1600, the time white traders were selling trinkets: copper beads, bells, and glass beads.

For the first several days, we found mainly pieces of broken pottery and cracked and broken bones of raccoon, turkey, and turtle. We also found utensils from hundreds of years ago. The cave man wasted no time in splitting marrow from the bones.

of the artifacts it had yielded, I concluded it was a promising site indeed—as nearly perfect as any I had ever seen. I reported enthusiastically to Dr. Stirling, who in turn described the discovery to the Research Committee of the National Geographic Society.

#### Society Grant Permits Digging to Start

With a National Geographic grant, I returned to Russell Cave in April, 1936. The Society also sent a photographer, Mr. Brooks Honeycutt, to record the progress of the dig.

Our first jobs were to hire men to help with the digging and to choose and stake off an area to excavate.

We were fortunate in being able to recruit some experienced coal miners in near-by South Pittsburg, Tennessee. Archeological digging and mining coal are far apart in method, yet their mining experience proved invaluable before we were through.

As for choosing an area, after studying the cave we selected a site 30 feet square near the north wall, 60 feet back from the entrance. We picked this spot for a number of reasons. Primarily we chose it because it was a likely place for the cave men to have lived—near enough to the entrance to be light in daytime, far enough back to be out of the wind and rain; secondly, because the surface here was relatively free of large stones.

#### Treasure Appears on First Day

With a crew of seven men we began the actual digging at 7:30 a.m. on May 1. Almost from the first turn of the first trowel the cave began to yield its treasure.

The first day of digging, in fact, and the first thin layers of fill we removed, took us back more than 300 years. For except on the very top of the cave floor, where we found rubbish left by recent visitors, we saw no traces of any white man's objects. From this we assumed that the topmost Indian deposits must date from about 1650, for not long after that time white traders appeared in the area, selling trinkets: copper bracelets, brass sleigh bells, and glass beads. We found none of these.

For the first several feet our dig produced mainly pieces of broken pottery, or potsherds, and cracked and broken bones of deer, bear, raccoon, turkey, and turtle—the scrapings and utensils from hundreds of primitive meals. The cave man wasted no food. Bones were split to remove marrow, and even skulls were

cracked so brain tissue could be dug out and eaten.

There were also small stone arrowheads, finely shaped products of what archeologists call the Mississippian and Woodland periods (roughly A. D. 1600 to 1000 B. C.). As we dug deeper, these disappeared, and we knew we had reached a time before the introduction of the bow and arrow.

Larger stone points, used primarily as spearheads but sometimes doubling as knives, retold a story already familiar to me: that as time progressed, primitive Americans grew less skillful (or less painstaking) at shaping stone (pages 548-9). The finest points are the oldest—the Folsom points of 10,000 or more years ago.

#### Paper Bags Keep Records Straight

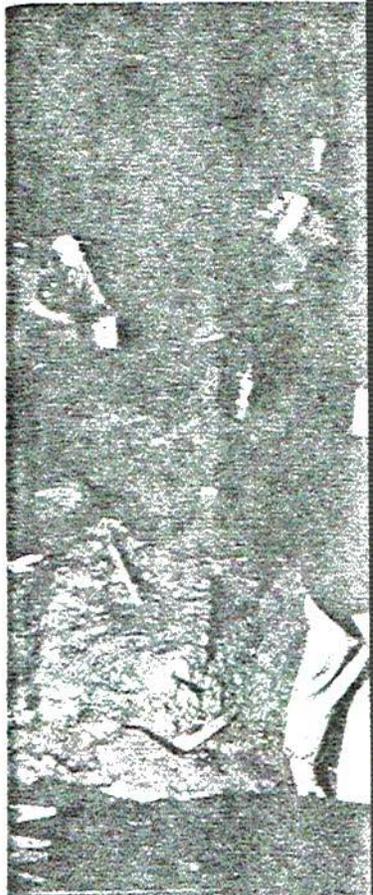
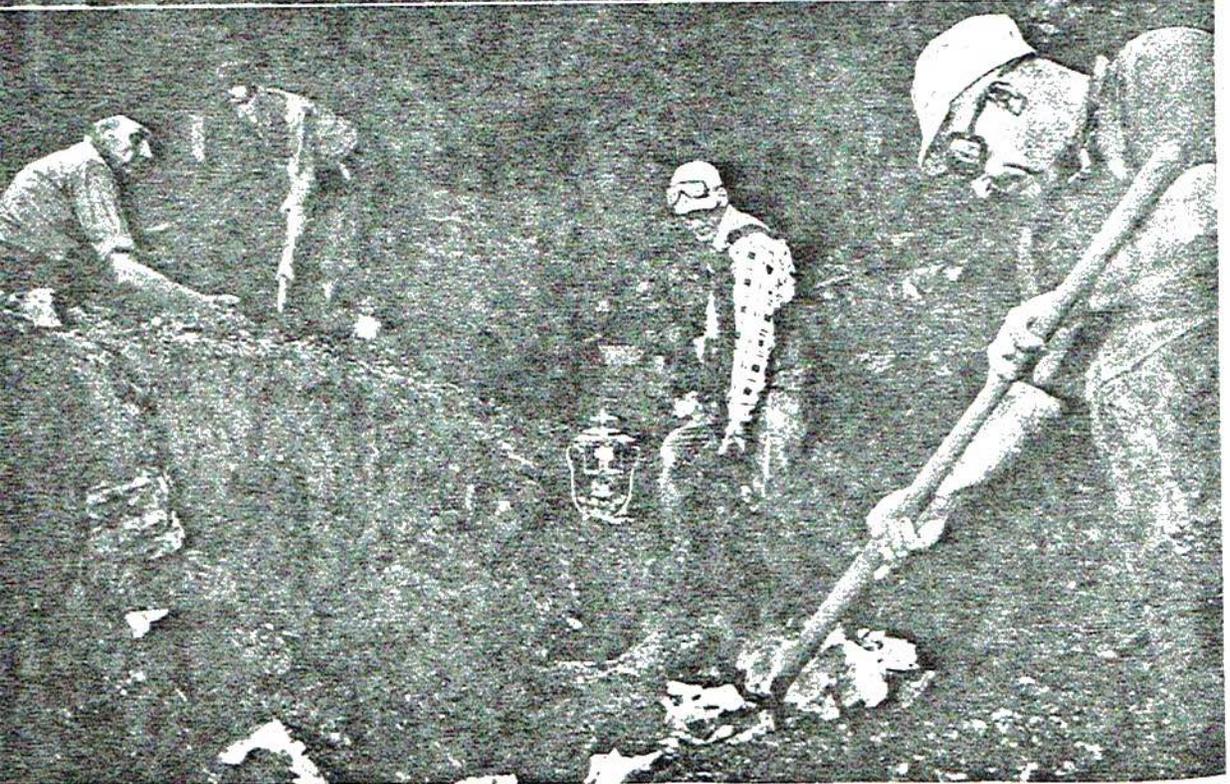
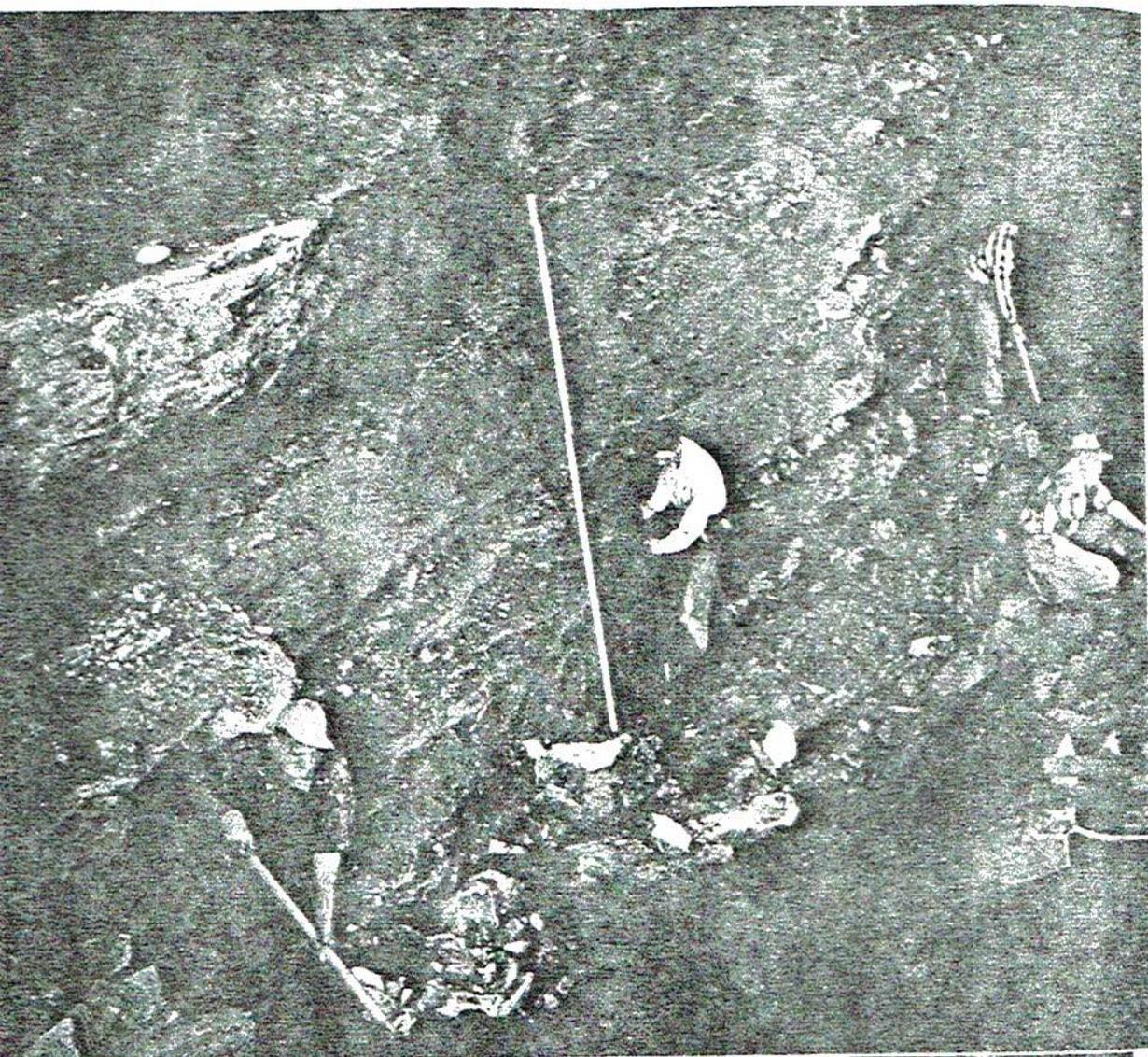
We kept careful records of where each bone and artifact came from. To the layman our methods might seem complex. They certainly did to the miners, who were more accustomed to digging, as the song says, 16 tons a day rather than a few ounces at a time.

We divided our 30-foot plot into smaller squares, each five feet on a side. These were excavated—using a mason's pointing trowel, not a shovel—six inches at a time. Beside each workman stood a paper bag carefully labeled to show which square he was digging and how deep. Each square got a new bag for every six inches of depth.

When a digger found a bone, a stone point, or any other solid object, he placed it in the bag. Each trowelful of dirt was examined, then shoveled into a wheelbarrow and carefully sifted through wire screens to make sure nothing had been missed.

At first the miners, who were being paid better wages than they received for mining coal, regarded this slow progress as a frightful waste of time and money. Left to their own methods, they could have emptied the entire cave in a few days. But gradually they changed their views. As each man found some valuable relic—a polished bone awl, a fishhook carved from a deer's toe bone (page 546), a fragile shell ornament—I would explain its significance to him and sometimes estimate its age. Impressed, the miners competed among themselves to see who could find the best artifacts.

There was also, especially at first, another element of excitement. Many of the men half





### The Pit Grows Deeper; Workers Peel Back Layers of Prehistory

Fourteen feet down, the worker beside the measuring rod (left) digs ground where cave men squatted about 6200 B.C. Charcoal left by their fires is the oldest yet tested from the southeastern United States.

Workers struck gluey clay near the lower level. Mud stuck to shoes until men were barely able to walk. Like cooks kneading dough, they squeezed the stuff through their fingers to find artifacts.

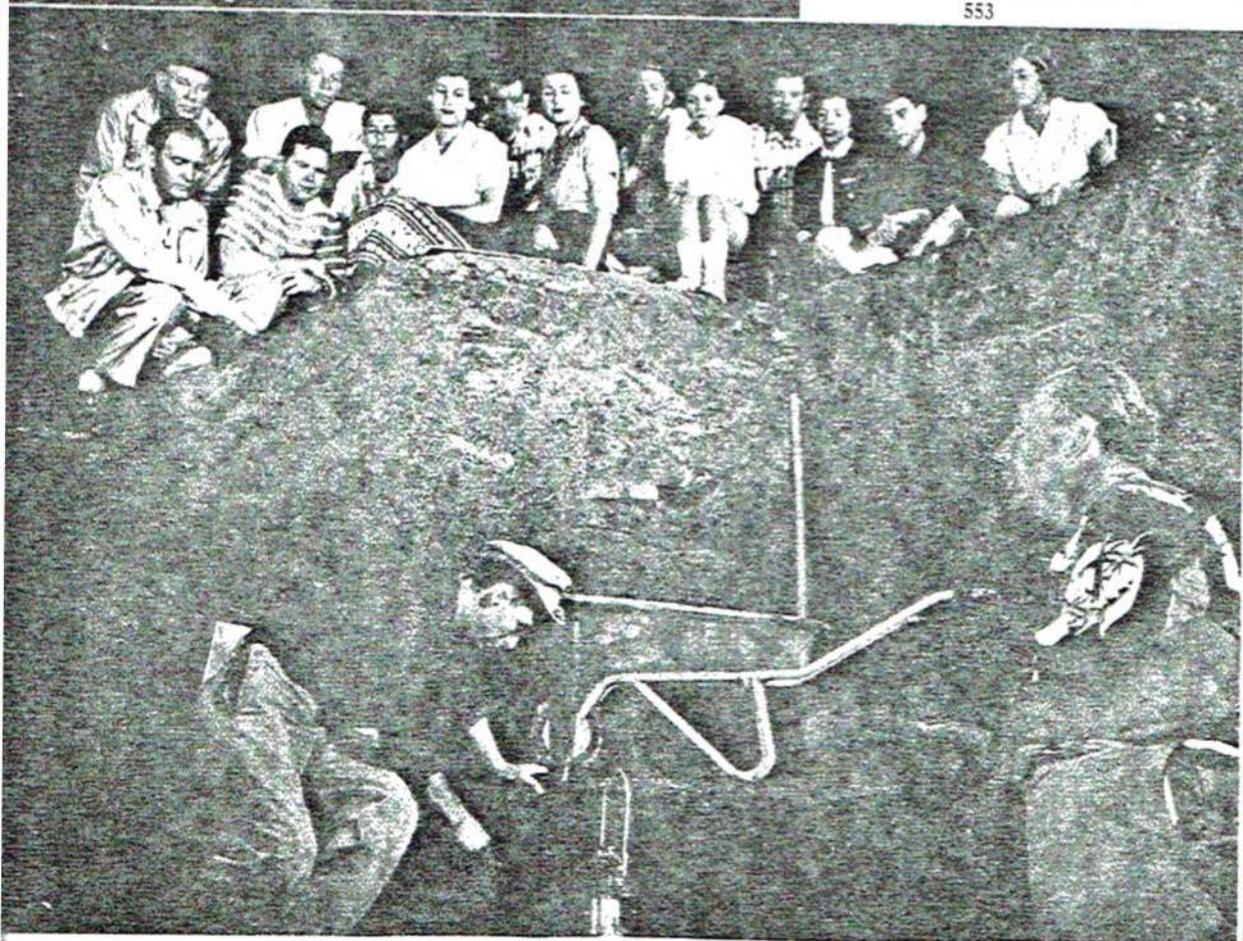
Page 552, lower: John Vinson (right) found the skeleton pictured on page 546.

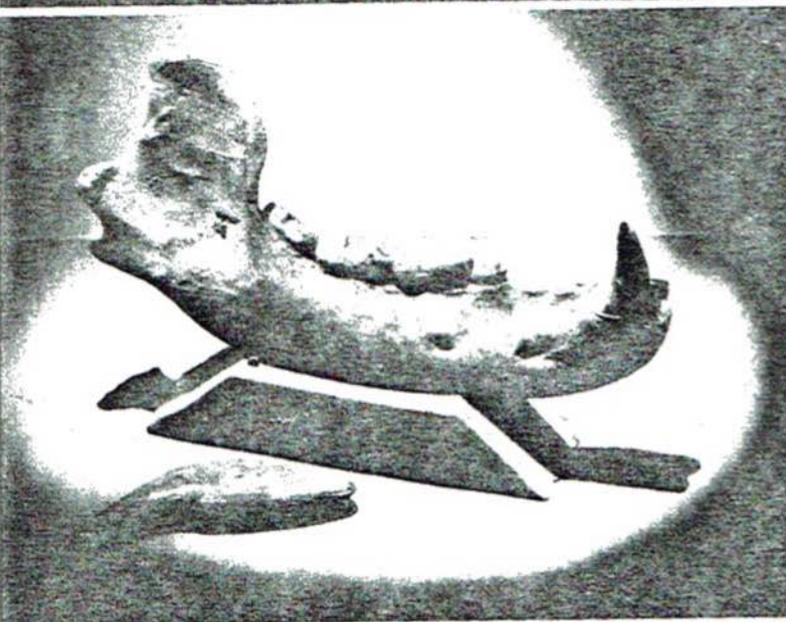
### College Students Visit the Archeological Site

Men and women from the University of Chattanooga hear a lecture by archeologist Miller, excavating the site for the Smithsonian Institution and the National Geographic Society. Using a trowel, Mr. Holloway demonstrates the way to keep the pit sides smooth.

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553





554 Willard B. Culver, National Geographic Staff

### Animal Bones Tell the Story of Ancient Man as a Hunter

Upper: Russell Cave's tenants of 2000 B. C. appear to have esteemed dogs, for they interred them carefully. The large skull came from such a burial. Smaller raccoon skull was crushed for its tasty brain tissue.

Lower: Most layers in the cavern revealed bear bones, including this lower jaw—evidence that Alabama men hunted the animals thousands of years ago.

believed that any turn of the trowel might uncover a hoard of buried gold. Legends passed on from the days of early settlers (among them Thomas Russell, for whom the cave was named) hinted at gold hidden by the Creek and Cherokee Indians who had lived in the area.

Another story, from the early days of Bridgeport, Alabama, told of a train robbery in which two armed men made off with a fortune in gold. A posse tracked them to Russell Cave. Both bandits were killed, but the gold was never found. Was it buried in the cave? If so, we dug in the wrong place,

for we found not a nugget.

As we worked our way downward, the pottery showed a change in hardness and decoration. At about five feet it disappeared altogether.

This was significant; it meant we had reached a recognized level of human prehistory, the beginning of Woodland culture and the end of what we term Archaic. The date for this change has been established at about 1,000 years before the birth of Christ.

### Time Moves Backward

Gasoline lanterns were our only lights, and as we dug in the dim and shadowy cave the effect was almost as if we were personally traveling backward in time, cut off from the modern world by thick limestone walls. Now, at 1000 B. C., it was fascinating to think of what would be happening in the rest of the world.

About this time King Solomon would be ruling in Israel. The ancient Egyptian civilization along the Nile had already passed its peak. Rome and Carthage would not even be built for another two centuries.

What was it like to live in a cave in 1000 B. C.? From things we found in the Alabama deposits (and from things we did not find), we can deduce a reasonably clear picture of a cave man's daily life.

Since we found no agricultural implements at this depth we surmised he did not grow any of his food. His sole sources of supply must have been hunting, fishing, and gathering of wild grain, nuts, and fruits.

He fished with bone hooks, probably using worms and insects for bait. He cracked mussels and other shellfish. With stone-tipped weapons he killed rabbits, turkeys, raccoons, opossums, deer, and other animals.

His chief pride, however, was his killing bear—a formidable man armed only with a bow. This are not only the bones but levels but bears' teeth as necklaces, doubtless.

Russell Cave's inhabitants had not only necklaces but rings, shell, and bone, and perhaps hematite; chunks of this were found in the cave.

### Postholes Hint at Fire

The cave dwellers must have been as we were at times, by the roof. Though this was not laden heavily enough to produce the large stalactites, it could have made a comfortable shelter. From postholes outlined, we could guess the dwellers protected themselves from water by erecting some sort of roof of hides sewed together.

Fires were built in the cave. The depressions are filled with ashes and charcoal. Smoke quickly wafted away by the wind that cools the cave. The dwellers ate around the fire, finished gnawing the bones, and cleaned up untidily on the floor.

Eventually the dirt and last month's meals grew so thick that primitive housewives, to clean up, dug quantities of earth and laid down a clean new floor.

We have assumed, but it is not certain, that the fill in the cave must have been for this purpose. It is possible that it could have been dug out for other reasons. It seems too high to have been dug out and windborne dust for so much material.

Before pottery was invented, people depended on woven baskets, though of course to some extent even a primitive basket was significant that at a time when upon a basket.

The basket was made of grass fiber sewed together with small seeds, probably from the cave men gathered. The basket were charred

His chief pride, however, must have been killing bear—a formidable adversary for a man armed only with a spear. Evidences of this are not only the bones we found at most levels but bears' teeth grooved to be worn as necklaces, doubtless as marks of prestige.

Russell Cave's inhabitants fashioned not only necklaces but rings and ear plugs of stone, shell, and bone, and painted themselves with hematite; chunks of this red ore were found in the cave.

#### Postholes Hint at Rainproof Shelters

The cave dwellers must have been annoyed, as we were at times, by water dripping from the roof. Though this water apparently is not laden heavily enough with minerals to produce the large stalactites found in some caves, it could have made sleeping uncomfortable. From postholes we found still clearly outlined, we could guess that the cave families protected themselves from the dripping water by erecting some kind of a canopy—probably of hides sewed together.

Fires were built in holes in the cave floor. The depressions are still there, filled with ashes and charcoal. Smoke, incidentally, was quickly wafted away by the same air current that cools the cave in summer. The cave dwellers ate around the fire, and when they finished gnawing the bones, they threw them untidily on the floor.

Eventually the debris from old fires and last month's meals grew too strong for even primitive housewives, and they carried in quantities of earth and covered it all up, laying a clean new floor.

We have assumed, in fact, that much of the fill in the cave must have been carried in for this purpose. It is difficult to see how else it could have been deposited, since the floor seems too high to have been flooded often, and windborne dust could scarcely account for so much material.

Before pottery was devised, the Archaic people depended on hide vessels and baskets, though of course these continued in use to some extent even after pottery. So it was significant that at about seven feet we came upon a basket.

The basket was saucer shaped, about 10 inches in diameter, and made of coiled strands of grass fiber sewed together. It was filled with small seeds, probably some wild grain the cave men gathered and ate. Both seeds and basket were charred.

Removing an object like this from the packed earth of the cave was a delicate operation. After thousands of years it had become extremely fragile—so much so that a brush rather than a trowel would have to be used to remove the dirt around it.

Since it was late in the evening when we found the basket, I decided to wait until morning before trying to dig it out. I did pick up a small loose section of it and some of the seeds.

The miners, by now all confirmed amateur archeologists, were nearly as excited as I was about the discovery. As we drove home that night (most of us commuted to the dig from South Pittsburg, 15 miles away), all we talked about was the basket: how old it might be, what we could learn from its construction and shape, what the seeds in it were.

But when we entered the cave the next morning, we were dismayed to find it gone—basket, seeds, and all. During the night some one had vandalized the cave, not only destroying the basket but also gouging several large holes in the side and floor of our pit. What else he (or they) found and removed we have no way of knowing.

From that time on we were forced to have a night watchman on duty—something I had not thought necessary before, since the relics, though of great scientific importance, have little monetary value.

#### Cave Man Suffered from Bad Teeth

It was while cleaning up after our night visitors that we found a human burial. If the vandals had dug four inches farther, they would have found him, too—a middle-aged gentleman interred in a semiflexed position. He had been placed some 4,000 years ago in a shallow hole and covered with debris. Limestone slabs had been laid on top of the grave, and these in time had settled and partially crushed the skeleton (page 546).

Of our whole crew, the one who developed the keenest interest in the archeological work was Claud Holloway, a young veteran who had lost a leg in World War II. He now undertook to dig the skeleton out. He spent three days at it, wielding his brush and trowel with almost incredible patience and care.

From a preliminary examination on the site we learned that this cave dweller had been 5 feet 2 inches tall, about 45 years old when he died, and suffering from an advanced case of pyorrhea. A detailed study of the skeleton

at the Smithsonian Institution in Washington, D. C., will eventually teach us much more about this Stone Age American.

Buried with the body were two large projectile points and, oddly, a heavy, cylindrical stone pestle about 12 inches long, used for grinding food—probably wild grain—against a rock mortar.

Interestingly enough, the skeleton of a small dog we found at a slightly lower level had been given a much more careful burial than the man. Its tomb was better built, with a stone base and slab sides to protect the body. It is well established, in fact, that dogs were scarce in this Archaic time, and highly valued for hunting. A broken stone blade had been buried with this one, perhaps as a token of affection.

The deeper we dug, the further back we progressed in time—and the more impatient we grew to progress still further. Archaic culture dates back, roughly, to 8000 B. C. Prior to that we find a culture that includes the very earliest known inhabitants of North

America. The term used to designate these people is Paleo-Indian. We were eager to find their traces in Russell Cave.

One of the best known and surest signs of the Paleo-Indian is the Folsom point, a delicately flaked and curiously grooved stone weapon tip quite unlike the points we had been finding. The name comes from the village of Folsom, New Mexico, where such points were first discovered in association with the bones of now extinct animals. Their age has been established at 10,000 years and older (page 549).\*

#### Reward Offered for a Folsom Point

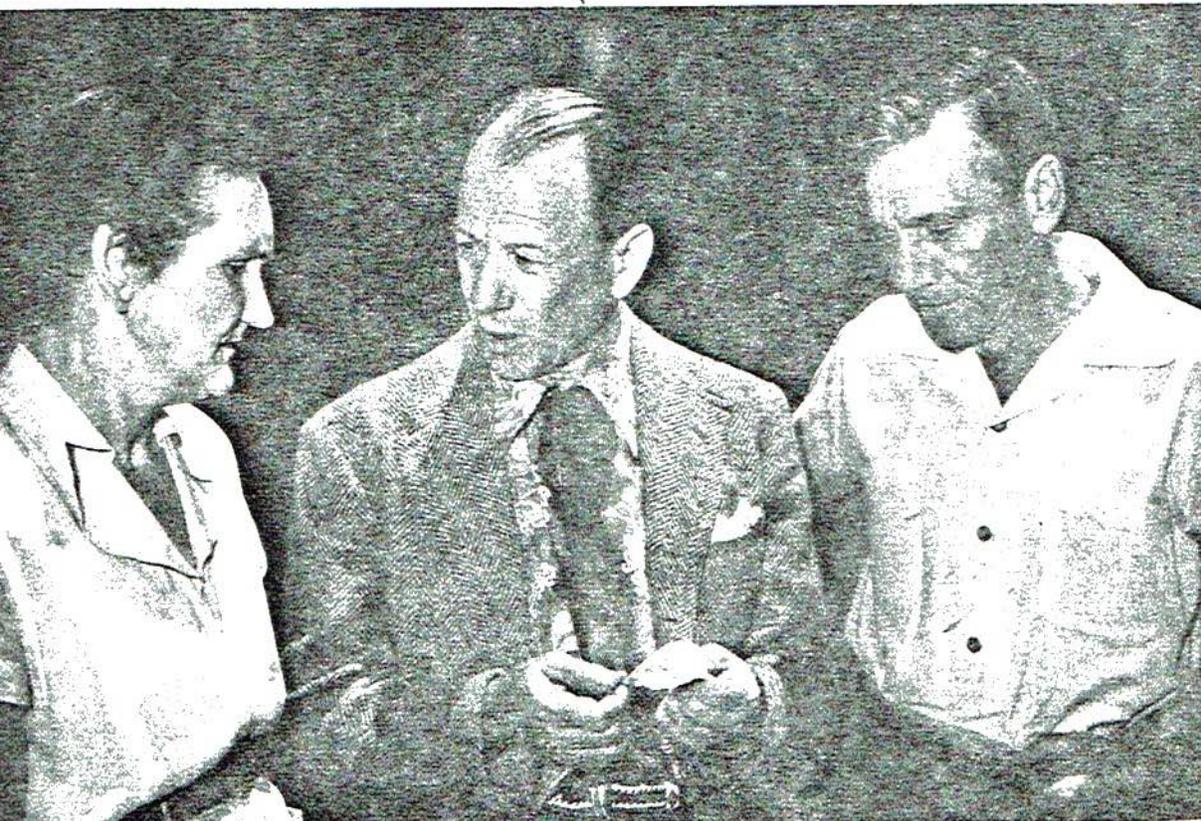
Though Folsom points have been found in the eastern United States—some, in fact, not far from Russell Cave—none has been found undisturbed in company with the charcoal, bones, and other artifacts left by early man. And since a stone object by itself cannot be

\* See "Ice Age Man, the First American," by Thomas R. Henry, NATIONAL GEOGRAPHIC MAGAZINE, December, 1955.

#### Cave Owners and Archeologist Examine a Mussel Shell Worn by an Aboriginal Alabamian

Without the cooperation of Mr. and Mrs. Oscar Ridley, author Miller (center) could not have fathomed the cave men's secrets. This conference took place beside the Ridelys' log smokehouse.

Brooks Honeycutt



dated by the carbon 14 method, the age of a Folsom point can only be determined when it is found with material of organic origin.

Thanks to photographer Brooks Honeycutt, we have some excellent pictures of Folsom points. The NATIONAL GEOGRAPHIC MAGAZINE had published earlier. A \$25 prize was offered to the man who found the first one.

But as our excitement grew, our progress slowed down. Below the eight-foot level in the cave, the sandy fill in which we had been digging gave way to soft, sticky clay, much harder to work. And in the clay, a little lower, we began running into large limestone slabs, obvious portions of the cave roof that had fallen thousands of years earlier. Some of these weighed tons.

This was where the previous mining experience of our men proved invaluable. They knew exactly how to break them up with a

There was a sort of rick sticks of dynamite had placed, a cry would ring "Fire in the hole!"

Everyone would then the man who lighted the series of shouts from w

"Fire number one!"

"Fire number two!"

"Fire number three!"

Then the last man out, and a few seconds later would echo from the ceiling slab would be knocked

I had feared at first might cause new rockfall dig itself. But, thanks to miners, the only damage

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There was a sort of ritual involved. After sticks of dynamite had been strategically placed, a cry would ring out:

"Fire in the hole!"

Everyone would then leave the cave except the man who lighted the fuse. Next came a series of shouts from within:

"Fire number one!"

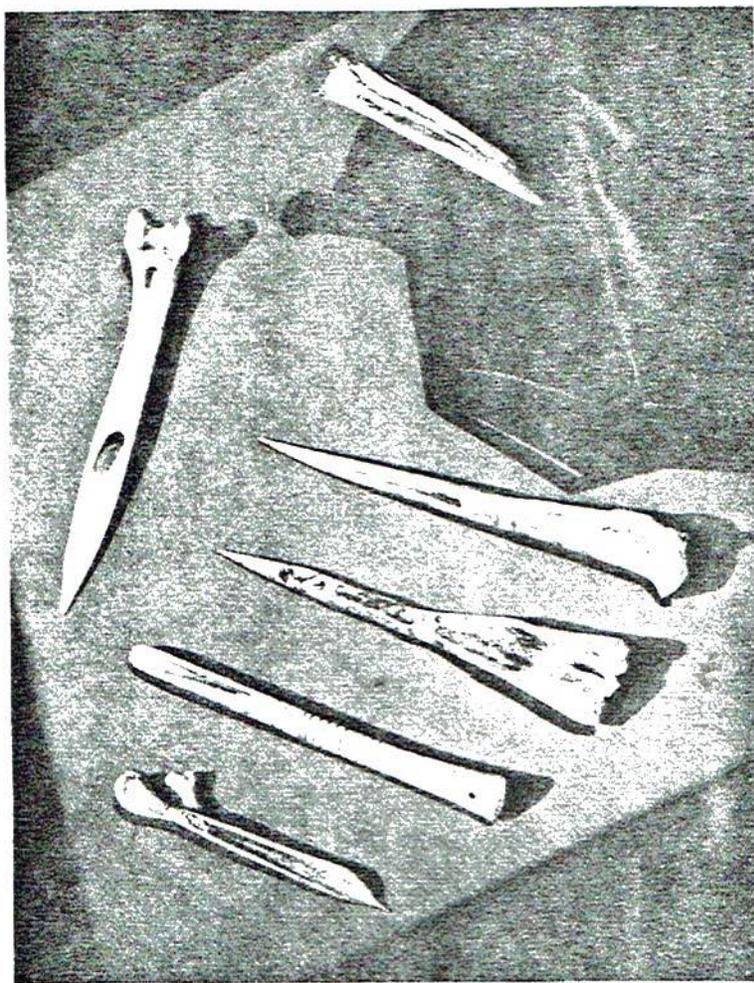
"Fire number two!"

"Fire number three!"

Then the last man would come running out, and a few seconds later a thundering roar would echo from the cave. Invariably the slab would be knocked into pieces.

I had feared at first that the explosions might cause new rockfalls, or even wreck the dig itself. But, thanks to the skill of the miners, the only damage was to the stones.

The blasting itself delayed us, however, for it left the pit filled with sour-smelling, eye-stinging smoke that took an hour or more



557 Willard R. Culver, National Geographic Staff

#### With These Bone Awls, Cave Women Fashioned Suits of Skin

Primitive artisans used deer and turkey bones to make household aids. Sharp implements punched holes in skins to receive lacings. Dull one may have helped in leatherworking; grooves decorate its handle.

to dissipate. We would try to blast, when possible, just before our 30-minute lunch period or before quitting at night.

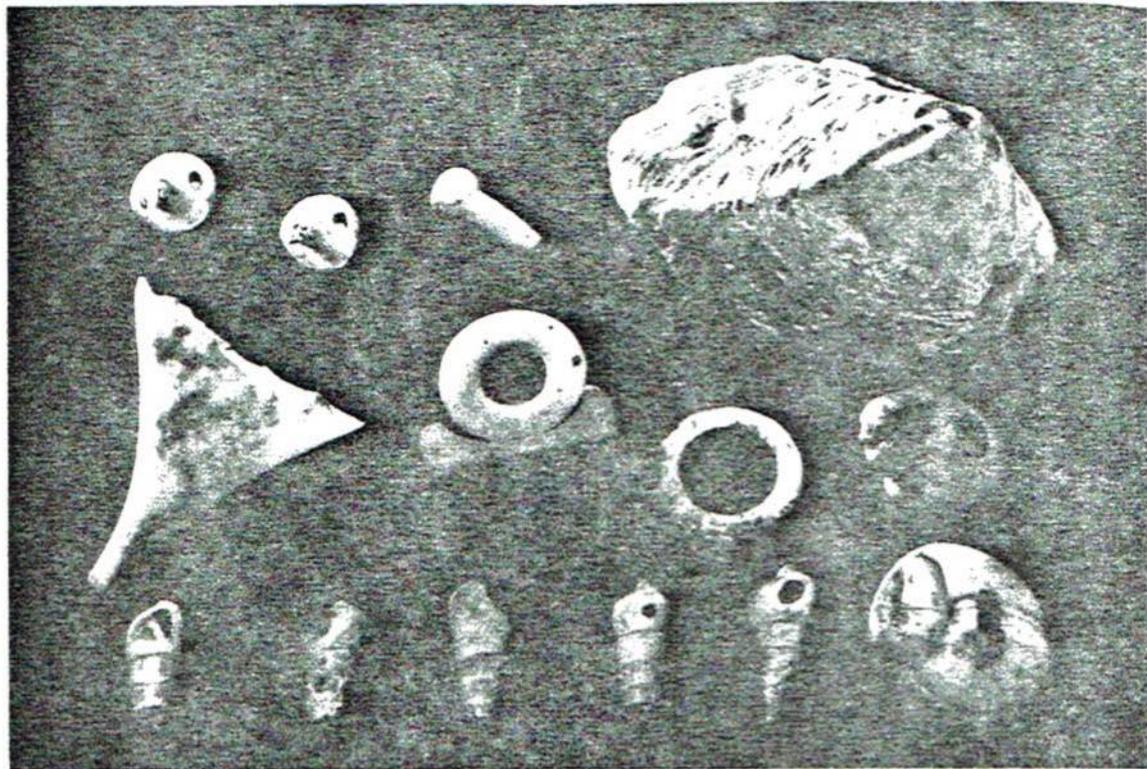
As we went deeper, the clay grew stickier. It clung to the soles of our shoes, forming great clods that made it difficult to walk. It disintegrated the bottoms of our paper bags, so that a board had to be placed under each one. Finally, sifting became impossible. Instead, each ounce of fill had to be kneaded through the fingers like dough to find the stone and bone artifacts.

#### \$25 Prize Remains Unclaimed

Occasionally one of the men would be sure he had found a Folsom point. He would hold up a muddy object and shout excitedly:

"Hey, Doc! I think I've got it!"

But each time, when the clay was washed off, we were disappointed. Near the 14-foot level, it is true, we were finding projectile points from the earliest Archaic period, and



558

Willard B. Culver, National Geographic Staff

#### Imagination Pictures Snail Shells Strung in a Necklace, the Mussel Used as a Spoon

Excavators believe both men and women wore this jewelry. Ring at right neatly fits a man's finger; smaller ring in center served an unknown purpose. Mushroom-shaped plug at top adorned a pierced ear.

some which may also have been used by Paleo-Indians.

We also uncovered, near the lowest level, a pierced stone which I identified as part of an *atlatl*, a primitive spear-throwing device. The name comes from the Aztecs, who used it in hunting and warfare. The smooth, round hole in the stone was probably bored with a hollow reed rolled between the palms, using sand on the tip as an abrasive (page 544).

But we have yet to find a Folsom point, and the \$25 prize is still unclaimed.

#### Mystery Still Lies Underfoot

It is by no means certain that we shall find Paleo-Indians and their relics as we dig deeper. A few inches farther down we may strike bedrock, and that will be that.

If so, Russell Cave will still rank as a major archeological discovery. Other digs have produced older material than we have yet found, and a few have gone deeper, but no other site in North America has provided such detailed stratification covering so long a time span.

In all layers we found not only abundant artifacts and bone relics, but also charcoal.

When carbon 14 tests of this charcoal are finished, we will have a unique timetable dating our tools, shells, bones, and ornaments almost century by century.

This will throw new light on the history of the whole southeastern United States—not only its primitive people but its plant and animal life as well.

Judging by the floor level of the unfilled cavern next to it, however, the rock bottom of Russell Cave may lie as much as 26 feet below the present floor. That would leave us 12 feet more to dig.

If men occupied the cave at this lowest level, the importance of the site will be increased tremendously. This is speculation. Only time and more work will tell us what still lies in the ancient soil beneath our feet.

Whatever we find, much credit is due to the men who brought the cave to our attention: Mr. Paul H. Brown, Mr. LeBaron W. Pahmeyer, Mr. Charles K. Peacock, and Mr. J. B. Graham. These four, all members of the Tennessee Archaeological Society, not only recognized the importance of Russell Cave, but also realized that its contents merited study by a national scientific organization.

## Ship

Scientists Seek W

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**S**HIPS sunk in battle, by aerial bombs, or by collisions—all are equally destructive, and entirely undetectable, and entirely unpreventable. But even the most primitive warship has been an equally destructive force, unseen, silent, and often fatal.

Wherever a wharf or pier meets the water or a wooden ship meets its enemies wait to attack and count for many millions of dollars each year.

The principal villain of the sea is the shipworm, a long, looking, soft-bodied creature. The shipworm, as it is called, has merged timbers while it is feeding rapidly inside the wood of the structure, riddling it with holes. The whole structure has become a sieve.

Thus, without damage to the outside, an entire structure can collapse in as little as a few months the time it was built.

#### Ship Departs with

The fate of a fishing boat at San Francisco wharf dramatically illustrates the suspected nature of the problem. The crew went ashore for a day, but part of the wharf was blown away by heavy wind. Weakened by the wharf's underwater timbers, the boat was off.

In tropic seas especially, the problem is so rapidly that the treated timber may be destroyed in months.

A few years ago a ship was built off Sand Island in the Hawaiian Harbor to carry the equipment for a concrete sewer outfall. It was needed only ten months before it was treated for protection. But the shipworms were so numerous that in less than 70 days large sections of the ship were being heavy machinery.

What kind of creature

# RUSSELL CAVE:

## NEW LIGHT ON STONE AGE LIFE

*Latest Excavations Show  
the Cavern Was Inhabited  
Nine Thousand Years Ago*

BY CARL F. MILLER, *Leader, Smithsonian-National Geographic Russell Cave Expeditions*

HE WAS short, naked, and desperately afraid. He ran, bending over to make himself smaller, sensing not so much by sound as by hunter's instinct that an enemy was close behind. Suddenly a stone-tipped shaft buried itself, with a stabbing pain, in the muscles of his back.

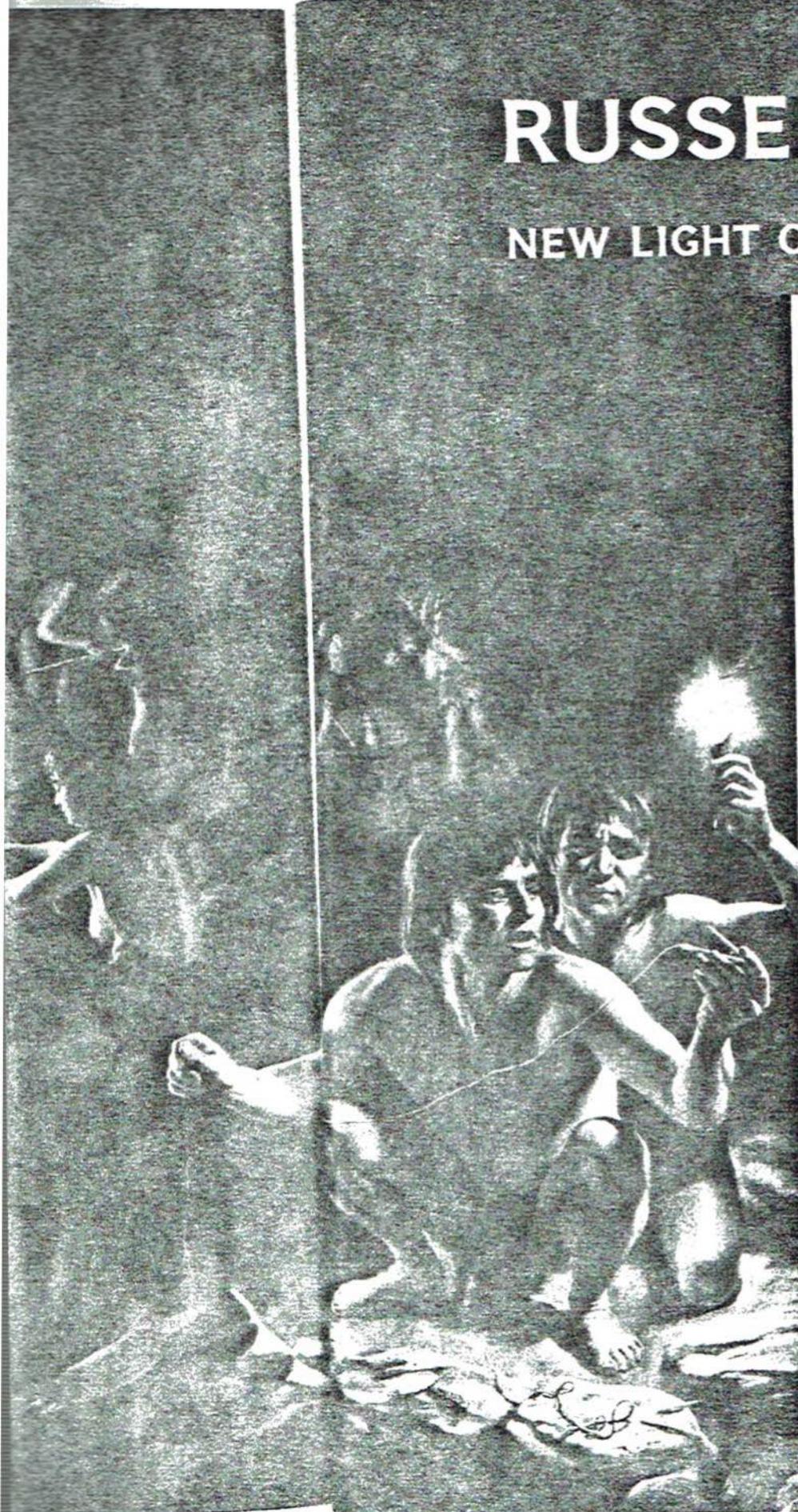
The warrior stumbled on, hid, and somehow escaped. Then he dragged himself, half paralyzed, back to the sanctuary of his dark, vaulted cave home on an Alabama mountain-side, and there he died.

No grave was dug for him. His body, with the stone spear point still in his back, was simply laid on the cave floor and covered with earth and refuse. Life went on around his resting place, as it had for thousands of years and would for thousands more.

This Stone Age American lived and died about 1000 B. C., when David was bringing the Kingdom of Israel to greatness. Yet the slain hunter was a comparative latecomer to the great limestone cavern where his family laid its campfire, ate, and slept. For at least 6,000 years before his lifetime, that opening in a wooded ridge near the present Tennessee border had sheltered primitive men, women, and children.

The remarkable story of Russell Cave in

Alabama of 8,000 years ago work by firelight in Russell Cave, oldest known home of man in the southeastern United States. To reconstruct the scene, artist Peter V. Bianchi used such clues as a bone lamp and fishhook found on the spot (pages 429 and 435). Actually, the people in this imagined scene may be "overdressed." Archeologists found no evidence that they wore even these scanty garments.



Jackson County, Alabama, has continued to unfold during the second season of excavations under auspices of the National Geographic Society and Smithsonian Institution.\*

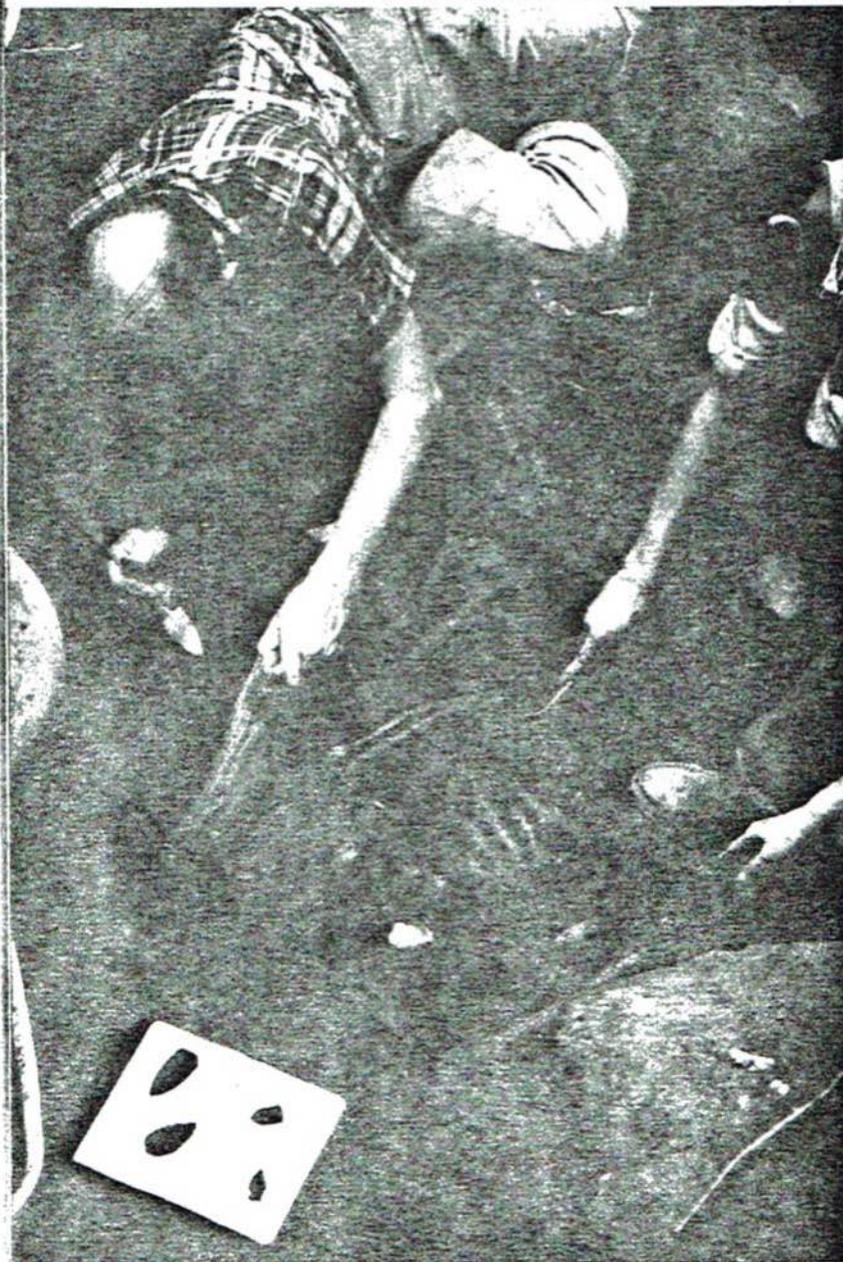
Layer by layer, as we have delved downward into the cave's floor, we have read from bones, tools, weapons, and ashes of ancient fires a unique record of life on this continent.

In our first season's work, the oldest campfire we discovered proved, by radiocarbon testing, to have burned about 8,000 years ago.

#### Hunter Took to His Grave the Missile That Killed Him

Like a detective sifting debris for clues, the author brushes earth from a skeleton buried about 3,000 years ago; he determines that the cause of death was the white-quartz spearhead near the spine. A later caveman dug into the grave and tossed away the skull (page 432). Spear and arrow points on notebook were found near by.

Illustrations by National Geographic Photographer Bates Littlehales



Now another hearth uncovered 23 feet down has been tested for carbon 14 and dated as 9,020 years old, plus or minus 350 years.

We have collected as well nearly two and a half tons of artifacts, the discarded odds and ends of an ancient people's life and livelihood. These have given us a more complete knowledge of the people of Russell Cave, though we still face a mystery about some of its very early inhabitants.

We uncovered tools and implements of a type never before found in the southeastern United States. They resemble closely objects of early human cultures in the Far North. Just how and why they came to northeastern Alabama we do not yet know.

Russell Cave was first investigated as a possible home of prehistoric man by members of the Tennessee Archeological Society in 1953. They unearthed stone points, bone tools, potsherds, and Indian ornaments in profusion. Suspecting they had made a major discovery, they notified the Smithsonian Institution's Bureau of American Ethnology, which, in turn, interested the National Geographic Society in the find.

To preserve the site for scientific study, The Society purchased the cave and surrounding 262-acre farm from the owners, Mr. and Mrs. Oscar Ridley, and has made liberal research grants to further the work there.

Our original dig was a 30-foot-long trench along one wall of the huge cavern. The second year we excavated a new section parallel to the mouth of the cave, meeting the earlier trench in a deep L.

\* See "Life 8,000 Years Ago Uncovered in an Alabama Cave," by Carl F. Miller, NATIONAL GEOGRAPHIC MAGAZINE, October, 1956.

uncovered 23 feet down carbon 14 and dated as plus or minus 350 years. It was as well nearly two and a half feet thick. The discarded odds and ends of prehistoric life and live-ly people given us a more complete picture of the people of Russell Cave, and a mystery about some of its inhabitants.

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In this new area, as in the old, our team of local coal miners and college and high school students worked downward in one-foot steps within squares marked by wooden stakes. Each handful of dirt went through wire-mesh screens or was kneaded by hand; anything found was put in a paper bag marked with the exact square and depth. As each bag was filled, another took its place.

Within the first few inches of the present cave floor we found, as we had the year before, relics of Indian life at a time when European colonists were still struggling for footholds on the eastern seaboard. These people, of the so-called Mississippi culture, date from about A. D. 1500 to 1650.

#### Pottery Marked with Wooden Paddles

Pottery unlike any found the previous summer bore markings left by small, carved wooden paddles pressed against the soft clay. The Chickamauga Cherokees marked their pottery that way. Since the pieces we found all came from one 5-foot square, we could surmise that a small band of Cherokees, or perhaps only a single traveler, camped in Russell Cave just long enough to break a cooking vessel, and then moved on.

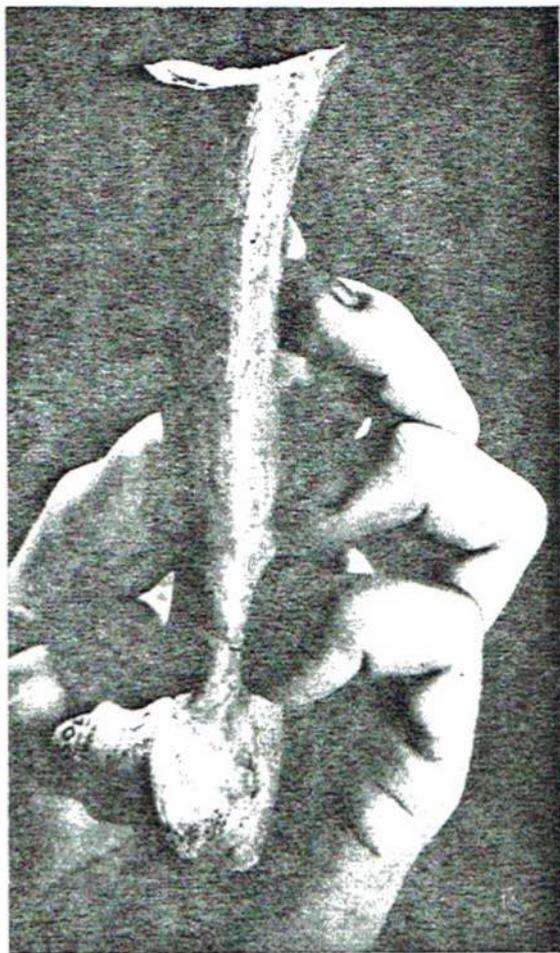
Through the next 4½ to 5 feet we again uncovered the floor-by-floor record of generations of Woodland peoples, who preceded the Mississippian era. Bone needles and awls, stone arrowheads, fishhooks, ornaments of pierced mussel and periwinkle shells—all told their mute story.

Imagine with me for a moment Russell Cave as it was then, the home of these stalwart Woodland people.

Each morning the rising sun pours light into the yawning mouth of the great cavern, 107 feet wide and 26 feet high, facing east across the valley at its doorstep. Just below flows the clear, cold stream of Dry Creek, which turns and disappears into the mountainside through an even larger cave next door.

The men soon depart into the forest that rolls away endlessly in all directions. With bows and arrows, stone-headed spears and axes, they hunt deer, bear, wild turkey, raccoons, rabbits, turtles, and snakes. If hunting is poor, they scour the woods for berries and nuts. Growing plants for food, if known at all, is extremely primitive. Why farm, when the forest holds food for the taking?

While the hunters are away, the women and older girls squat at work. Animal-hide canopies stretched between wooden posts keep off dripping water.



#### Bone Lamp Dispelled the Cave's Gloom

To make torches, Archaic people hollowed the fore-ribs of bears and packed them with bear fat. Painting on page 427 shows such a lamp in use. Constant handling gave the artifact an enduring polish.

The women moisten clay, already cleaned by working it through loosely woven baskets, and roll it into long, supple ropes. These they coil in spirals to shape wide-mouthed jars, some as large as five gallons in capacity. They pinch the coils together to join them and smooth the sides by hand (page 437). Decoration is added to the neck or shoulder of a jar by pressing with carved paddles, basket mesh, or crudely woven cloth. Sometimes they may scratch a design with pointed stones or bones, or paint the pottery with a slurry of red hematite in water. Then they place the jars atop glowing coals to harden.

Other women weave sleeping mats from rushes and cane fibers, scrape bear hides with sharp-edged stone dressing knives, or sew leather bags from supple deerskins. Their smoothly polished bone needles have small, 429

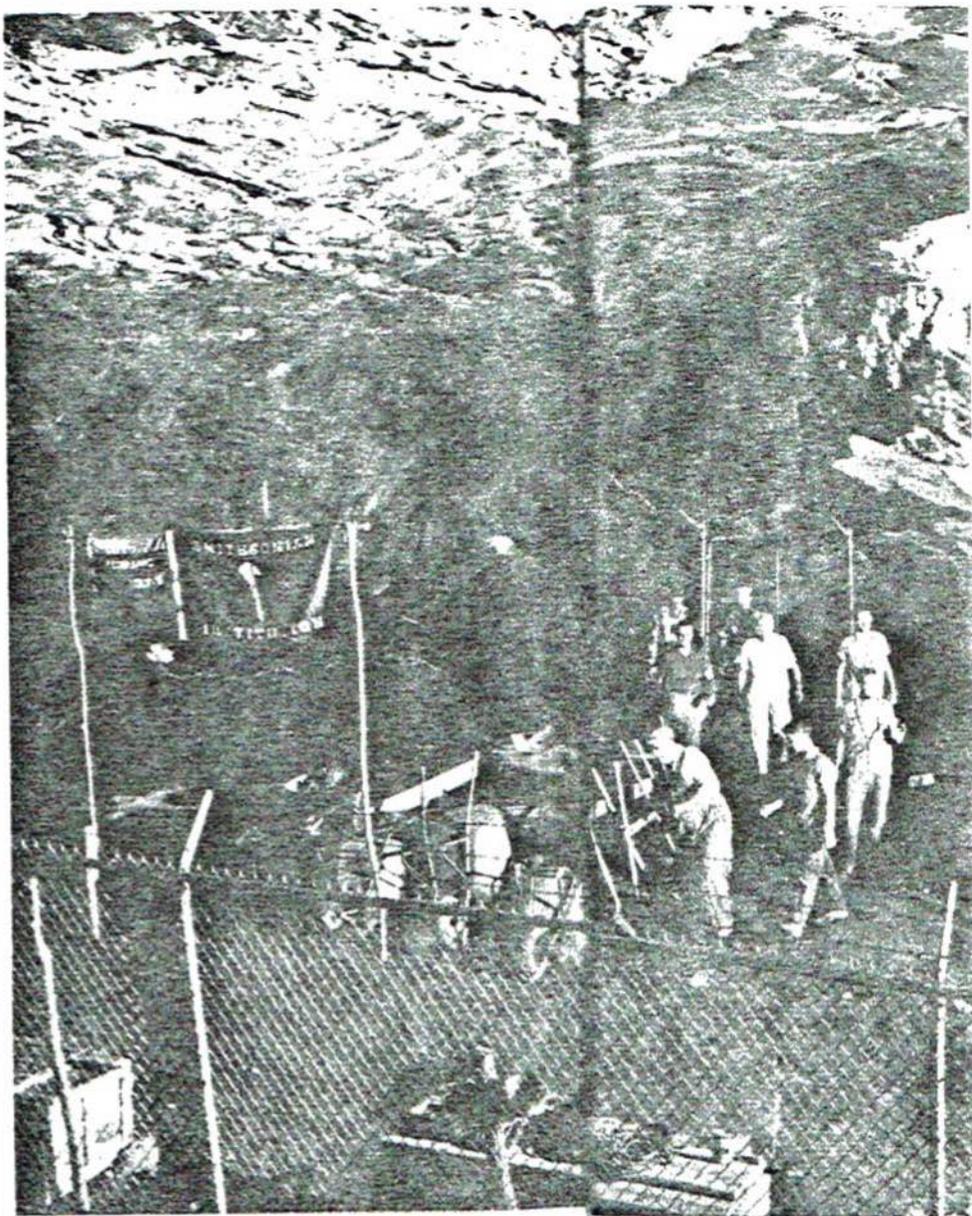
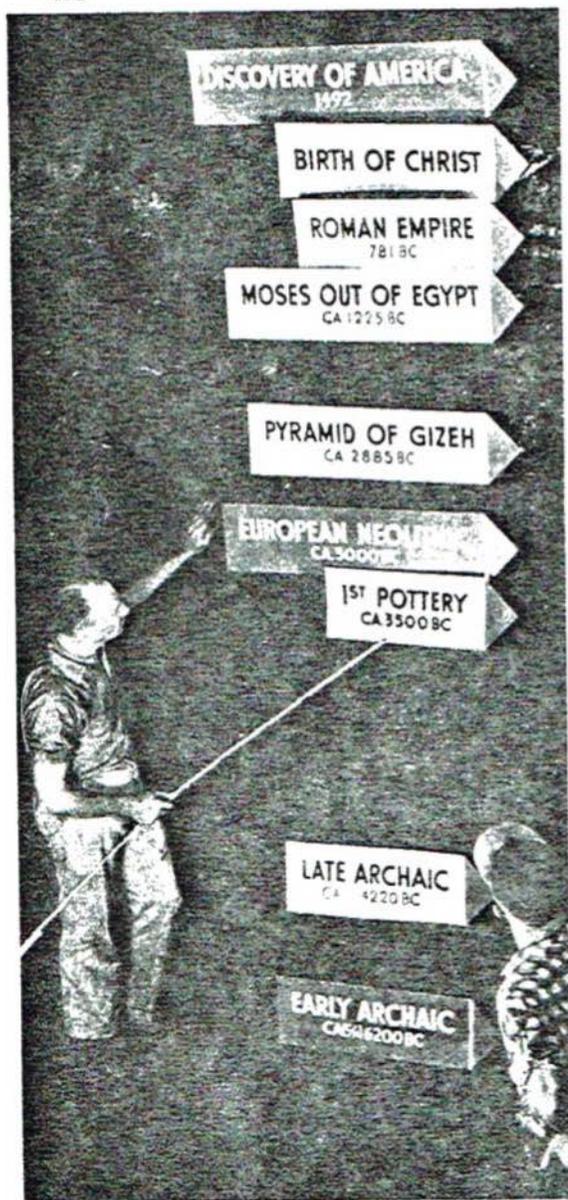
## Russell Cave's Rocky Vault Preserves the Story of Ancient Americans

As big as an auditorium, the limestone cave yawns from a mountainside in northeastern Alabama.

In two seasons of work here National Geographic Society-Smithsonian Institution teams have dug 32 feet into the cave floor and 9,000 years back in time. Stout wire fences protect their discoveries from curiosity seekers.

Ladder of time marks each foot of the dig. Most recent Indian remains, only a few inches deep, date from about A. D. 1650. Oldest discovery, the charcoal of a smothered fire, came to light 23 feet down, or 10 feet beneath the lowest sign. Radiocarbon tests have dated it as 9,020 years old, plus or minus 350.

430



straight-sided eyes, through which they thread animal sinew or gut.

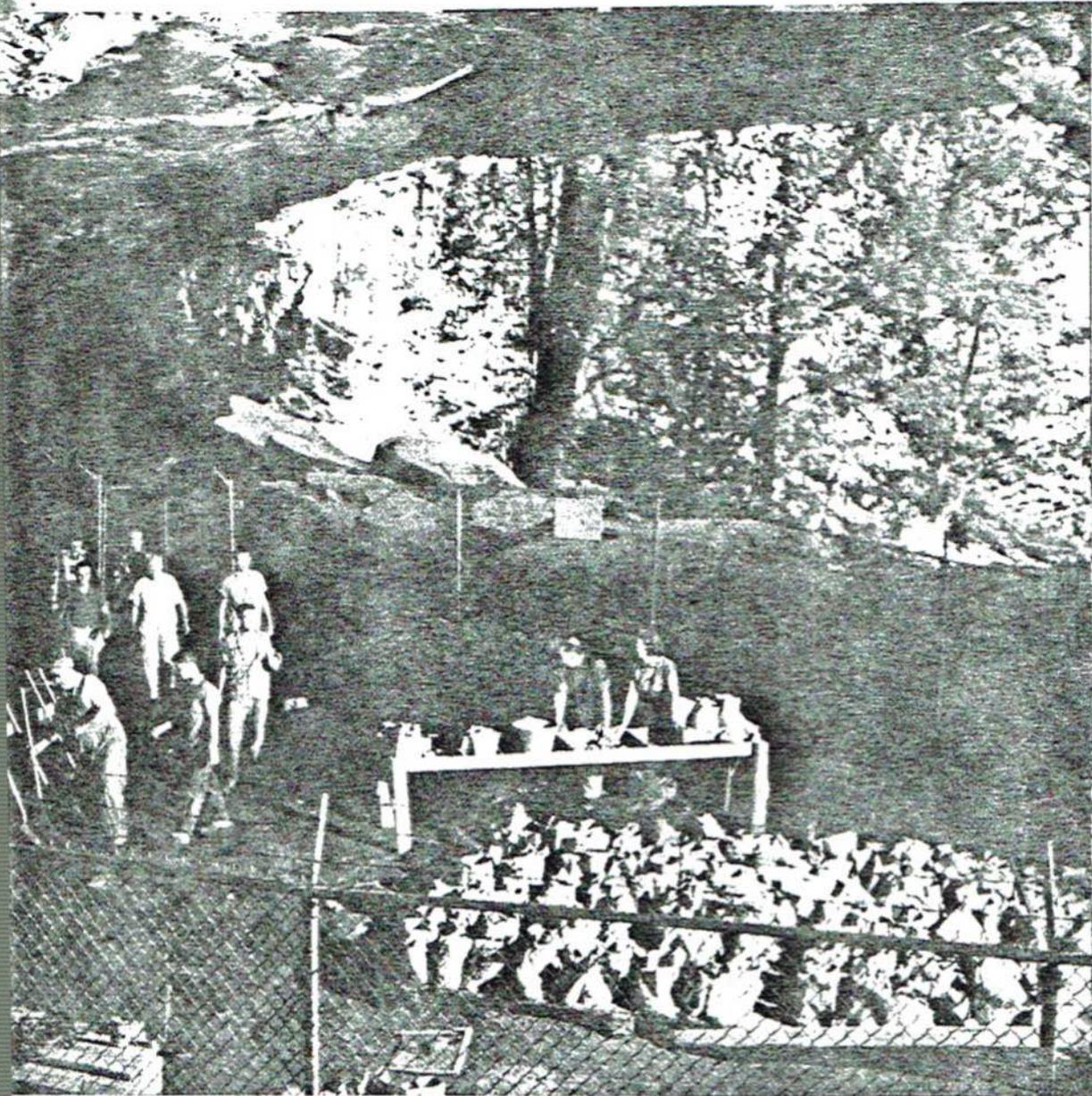
Naked children dash hither and yon about the mouth of the cave, playing the boisterous games of youth. As sunset nears, the men return to divide their kill. If the hunt has been good, no one will go hungry.

Soon each family gathers around its fire to eat, laugh, and boast of the day's experiences. Then the hubbub in the cave gradually dies. Only the glow of dying embers testifies that humans are here, asleep.

Generation after generation this life goes on. Whenever the stench of gnawed bones and piles of rubbish becomes too much for even these untidy people, the women bring in basketfuls of earth and spread a clean new floor. Thus they preserve, for archeologists of the future, a lasting record of their way of life.

In some eras the cave dwellers were housekeepers, digging pits and lining them with boards for their belongings. Some of the pits were lined with rough limestone blocks, others were of hard-packed earth. The cave was rich in ancient artifacts, broken pottery, animal bones, and other rubbish. The people were blood folk.

My wife Ruth, who works on the fascinating unraveling of our history, came upon two stone axes, one shaped and notched only crudely, the other fully grooved to fit a notched handle. Obviously took long hours of work. Its maker had chipped and pecked the hard rock, smoothing and polishing it. He had sharpened his weapon to



In some eras the cave dwellers were better housekeepers, digging pits as storage cupboards for their belongings and as garbage dumps. Some of the pits we found had floors lined with rough limestone blocks, while others were of hard-packed earth. All have proved rich in ancient artifacts, broken pottery, animal bones, and other rubbish of flesh-and-blood folk.

My wife Ruth, who works with me in this fascinating unraveling of ancient American history, came upon two stone axheads unlike any found before in Russell Cave. One was shaped and notched only crudely. The other, fully grooved to fit a notched wooden handle, obviously took long hours of work (page 436). Its maker had chipped and pecked away at the hard rock, smoothing and polishing, and finally had sharpened his weapon to a keen edge.

It must have constituted real wealth to its owner. A primitive man might buy himself a wife by offering such an ax to a girl's father, as the artist depicts on page 437.

We discovered also two hairpins of polished bone, shaped with definite heads like large nails. Thus we can guess that some of these Woodland people were not content with unkempt mops of hair that hung down their backs and around their faces. The pins could have held a sizable coil of hair neatly in place at the nape of the neck.

#### Infant Buried Near Slain Hunter

At the 4-foot level, in the Early Woodland period, we found the skeleton of a baby. It was so little that it must have been newborn or born dead. Someone had dug a small pit, placed the infant curled on its side in the

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hole, and refilled the grave with earth slightly darker than the surrounding soil.

Twenty-five feet away, at the same level, Ruth came upon an adult male, or what remained of him. When we uncovered his skeleton, the skull, neckbones, right collarbone, and upper right arm were missing.

At first I thought he might have been the victim of a gruesome dismemberment while still alive. The taking of heads for skull trophies was not unknown among southeastern Woodland peoples. But the large number of bones that were missing and the grave itself eventually told the story (page 428).

Apparently some later cave dweller, while digging a pit, chanced upon the buried hunter. Not knowing who he was and probably caring less, he simply tossed away the skull and other bones and went on digging.

Very carefully we scraped and brushed the earth away from the part of the skeleton that remained. My wife was the first to notice something else unusual.

"Carl," she said suddenly, "this man was killed!"

Close beside the backbone lay a large projectile point chipped from white quartz. The spear or dart tip had been driven into the body from behind. From its upward angle, it had struck while the man was hunched over, probably running away in the manner we have described. It had either severed or pressed against a major nerve channel along the spine, and must have left his legs completely or partly paralyzed.

#### No Weapons Left with Indian Dead

Neither in these graves nor in a third at the 9-foot level, where a much older cave man lay on his right side with his knees drawn up to his chest, did we find anything buried with the dead. No ornaments, trophies, or weapons were found with the skeletons, or containers that might have held food or water for the journey to the hereafter.

Perhaps the cave dwellers' possessions were too few and valuable to be relinquished by the survivors, or perhaps all possessions were owned in common, not by individuals.

By the time we had dug down to the 5-foot level, we lost all traces of pottery. Hence we knew that we had gone beyond the Woodland period into the time of Archaic Man, who knew neither the making of pottery nor the bow and arrow.

As his chief weapon, Archaic Man used a

primitive spear-throwing device called an atlatl. We found two broken sections of deer or elk antlers that had been cut and shaped like large crochet hooks. These were designed to be lashed to short sticks and the base of darts or spears fitted into them (page 434).

Such hooked throwing sticks gave the hunter great leverage and power for hurling his shafts of wood or stiff reeds, tipped with sharpened bones, antler tines, or stone points. Still used by the Tarascan Indians of Mexico, the atlatl takes its name from the language of the Aztecs, whose prowess with the spear thrower founded an empire.

At 6 feet the nature of the soil changed abruptly to a wet, sticky orange-colored clay. It clung to our shoes, trowels, and shovels, requiring us thereafter to knead each handful, like heavy dough, to find objects buried in it.

#### New Type of Artifacts Uncovered

It was in this clay that we began finding human artifacts unlike anything ever before discovered in the southeastern United States.

One was a new type of fishhook, unlike those carved by the later Woodland peoples from single bones, such as the toe bone of a deer. The older hooks, from the Late Archaic, consist of two pieces of either bone or wood. They are made to be lashed together by animal sinew or plant fibers into a hinged V (page 435). Once the hook was in a fish's mouth, any pull would force it to open wider and thus plant itself more firmly.

This ingenious device resembles, more than anything else, fishhooks used by much more northern early Indian people and later by the Eskimos. We found other implements that bear this same strange kinship to more northern cultures.

Two polished humeri, or upper foreleg bones, of large bears were unearthed from the same cultural level. Each had been cut cleanly, the edges rubbed smooth, and the inner spongy matter scraped out (page 429).

Bear fat could then be stuffed into the closed tube, as well as some sort of wick. This little torch would flicker with a long-lived smoky flame, giving the cave man light he could carry around like a candle.

What long-forgotten forerunner of Thomas Edison thus gave his people a new means of illumination, no one will ever know. But by the end of the Archaic cultural period—perhaps 5000 B. C.—man had risen to a stage where he could think out such an invention,



Cavern E:  
Coal miners  
and shovels.  
Service arch  
Mrs. Miller.



**Cavern Explorers Cut a Giant's Staircase into the Prehistoric Past**

Coal miners and college students carved this step trench, using trowels and brushes, picks and shovels, and even dynamite. The author (at left on platform) shows the dig to Park Service archeologist John Corbett; Conrad Wirth, Director of the National Park Service; Mrs. Miller; and Lyman J. Briggs and Melvin Payne of The Society's Research Committee. 433

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actually make the device, and reap the results of his thought.

We can imagine the Russell Cave inhabitants crouching on their haunches after dark, talking to one another in guttural monosyllables while their lamps flickered in the gloom (page 427). So often were these particular bear-bone tapers used and handled that even today their surfaces shine as if waxed, and the bone has turned a rich amber.

#### Folsom Man Roamed Alabama

How did such artifacts, heretofore found only much closer to the Arctic, come to be made and used as far south as Russell Cave?

During the last Ice Age, as we reconstruct migration routes of the earliest Americans, there was a slow but steady movement of Paleo-Indians, or Early Man, eastward across the continent.\*

We suspect that these wandering hunters roamed the region around Russell Cave 10,000 years ago and more. Folsom Man, so named for the discovery of his delicate and skillfully fluted weapon points near Folsom, New Mexico, in 1926, left similar relics of his

passing within a few miles of Russell Cave in both Alabama and Tennessee.

Later there were movements of peoples of Archaic culture both north and south along the Appalachian Mountains. Those coming south may have brought customs, tools, and tool-making methods from the Far North. In a curving region around the southern end of the Appalachians, in what is now Alabama and Georgia, these northerners met people from the West and South.

Our discovery of jointed fishhooks, bear-bone lamps, and small knife handles made of grooved bear teeth, as well as such devices as the atlatl, suggests that Russell Cave lay in this ancient meeting ground. It thus gains added significance as a key archeological site, offering greater understanding of ancient human movements in North America.

In our first year's work, less than 14 feet beneath the present cave floor, we found charcoal evidence of human life dating back more than 8,000 years. As we passed this

\* See "Ice Age Man, the First American," by Thomas R. Henry, NATIONAL GEOGRAPHIC MAGAZINE, December, 1935.

#### Giving the Arm More Leverage, Atlatl Hurlled Spears Farther and Faster

Aztecs used and named the atlatl, which in North America long preceded the invention of the bow and arrow. This notched deer antler capped the end of a short throwing stick that crumbled to dust long ago. A warrior fitted the butt of his spear into the notch and whipped his guided missile into the air as if by catapult. The pointed bone in hand tipped the shaft. Atlatl at right shows the bone's hollowed end.

434



level and went deeper than we had worked in constant anticipation of new finds, artifacts such as Folsom would prove the presence of Early Man in the cave.

Disappointingly, our first findings were fewer the farther down we went. At the deepest point we found, a layer of limestone showed enough similarities to the Folsom period to permit it to be called Early Man himself. We knew that this level represented the beginning of a new culture and the end of the Folsom period.

#### Campfire Burned 9,000 Years Ago

Below that we found one layer of limestone suggesting that stone tools were made in the cave during this period. It was sparsely spersed with the chips and bones, either whole or broken. We found lumps of charcoal to hint that a fire had burned in the cave so long ago.

Then, at 23 feet, we found a layer of charcoal next to the remains of trowels and brushes with a layer of limestone. We covered as much of this charcoal as we could, sealed it in a quart fruit jar with aluminum foil to seal it, and an airborne radioactive container.

I sent the sample to the laboratory of the University of Michigan at Ann Arbor, as one of the first of the Russell Cave findings to be tested. H. R. Crane determined that the charcoal had burned some 9,000 years ago.

Thus our record of human occupation at Russell Cave was extended back to the era of Early Man. No other site in the southeast has yielded a layer cross section of continuous human occupancy over so long a period.

As we probed deeper into the earth, thousands of years, again and again, we found limestone slabs and jumbled bones fallen from the roof of the cave. They have been a danger to the cave dwellers a million times more than they are now, as if all the plaster on your walls and ceiling were to drop in on you. Yet each time we found the remains of human occupancy covering the rock.

These slabs prevented us from using long rods for the original findings. We had to break many of them into smaller pieces as we dug downward. John (Red) Blansett, members of the Cave Club, experienced coal miners, knew

level and went deeper the second year, we worked in constant anticipation of still older finds, artifacts such as Folsom points, that would prove the presence of Early Man in the cave.

Disappointingly, our finds grew fewer and fewer the farther down we progressed. The deepest point we found, at the 16-foot level, showed enough similarities to points of the Folsom period to permit it to be attributed to Early Man himself. We knew, therefore, that this level represented the beginning of Archaic culture and the end of the earlier Paleo-Indian period.

#### Campfire Burned 9,000 Years Ago

Below that we found only chips of chert, suggesting that stone tools might have been made in the cave during this older era. Interspersed with the chips were many animal bones, either whole or broken, and specks and lumps of charcoal to hint that man inhabited the cave so long ago.

Then, at 23 feet, we found a small pocket of charcoal next to the north wall. Using trowels and brushes with great care, I gathered as much of this charcoal as possible, sealed it in a quart fruit jar and wrapped the jar with aluminum foil to shield it from any airborne radioactive contamination.

I sent the sample to the radiocarbon laboratory of the University of Michigan at Ann Arbor, as one of the first of the new Russell Cave findings to be tested. There Professor H. R. Crane determined that the charred embers had burned some 9,000 years ago.

Thus our record of human occupancy of Russell Cave was extended back well within the era of Early Man. No other archeological site in the southeast has yielded a layer-by-layer cross section of continuous human life over so long a period.

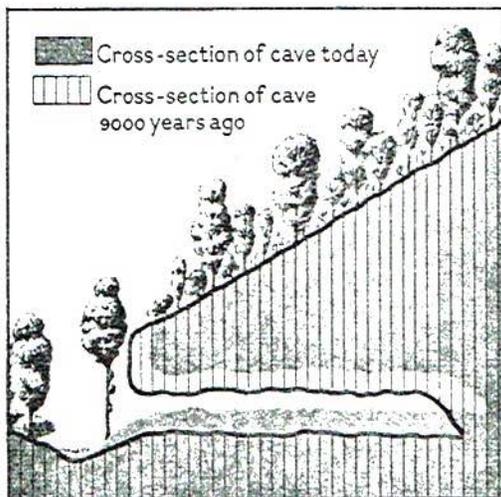
As we probed deeper into the story of those thousands of years, again and again we struck limestone slabs and jumbled blocks that had fallen from the roof of the cave. They must have been a danger to those ancient cave dwellers a million times more fearsome than as if all the plaster on your living room ceiling were to drop in on you some evening. Yet each time we found the signs of later occupancy covering the rock falls.

These slabs prevented us from probing with long rods for the original floor of the cave. We had to break many of them by dynamite as we dug downward. John Vinson and Fred (Red) Blansett, members of our team of experienced coal miners, knew just how to ex-



#### Hinged Fishhook Puzzles Science

Large two-piece hook, once lashed at the base to form a V, resembles those made by Indians and Eskimos of the North. Its discovery as far south as Alabama raises new questions about early migrations across the North American Continent. Later Woodland peoples slotted pieces of deer bone, as at right, then ground them into smaller, one-piece hooks.



As the roof fell, the floor rose. Limestone slabs from the ceiling and debris from human occupation lifted the cave's level 23 feet in 9,000 years.

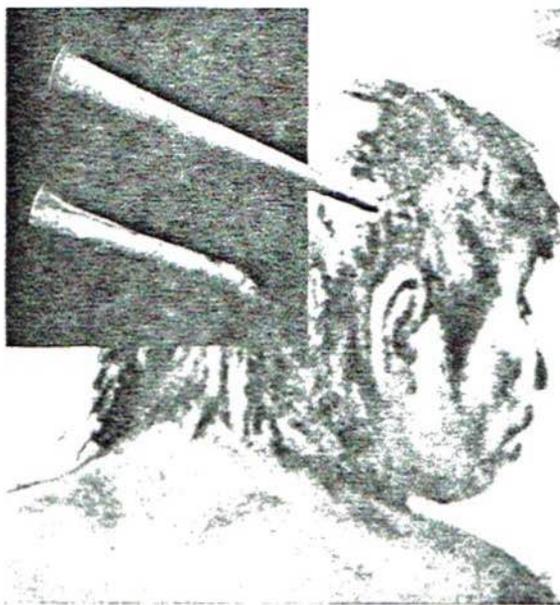
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**Bone pins** held shaggy hair back from the face. These pins, worn by women in the painting, were found in Russell Cave at the Woodland level.

436

**Stone axheads** show a wide gap in craftsmanship. Crudely flaked, notched variety (upper) took far less work than the carefully shaped weapon shown below and opposite. The groove around its neck fitted a notched wooden handle.



plode their charges to reduce the rock to manageable sizes without damaging the dig itself.

Whenever possible, we set off our blasts at the end of a working day, to allow the acrid fumes to dissipate overnight. The morning after our most powerful dynamiting, we were hard at work removing the rubble when a thunderous rumble of falling rock made us duck instinctively.

#### Hidden Chamber Abuts Russell Cave

But the rockfall was not within the cave, nor was it outside and above us on the mountainside, where several visitors to our digging were standing. One woman, in fact, was terrified for fear all of us in the cave had been buried. The slide seemed to have occurred just beneath her feet.

A hidden chamber must abut Russell Cave within the mountain, we realized. Rocks disturbed by our blast of the previous day had given way in an unseen slide.

When we tapped on the cave's north wall, a distinct hollow sound returned to us. Excitedly we cleared away more of the dynamited rock and found the rock face beginning to slope away from us, undercutting at a sharp angle. We thought we had found an opening, when the wall again dropped off vertically.

Farther and farther we dug, and still we found no mouth to the blind cavern. Finally, at 32 feet, we struck water. There was little chance of continuing without pumping equipment. Since our digging season had also run out, we gave up reluctantly for the year.

Though we still do not know how much deeper the deposits of Russell Cave may extend before we reach an original floor, the bones, tools, weapons, and ancient fires we found have already provided ample reward for our labors.

We have proved the cave a unique timetable of human existence in North America. Whether or not we find even older relics of Early Man, we have gained new understanding of forgotten Americans who lived, slept, and died in Russell Cave so long ago.

#### Young Cave Man Offers His Treasured Stone Ax as the Price of a Bride

Re-creating a scene from the Woodland era, the artist depicts a suitor bargaining with his prospective father-in-law. Eavesdropping, the girl brings a basketful of clay for her mother's pottery making. Bow and arrow carried by the hunter succeeded the atlatl as the chief weapon of Woodland times. Hides stretched between poles ward off dripping water.

The artist has painted these cave people in scant attire; the author believes they wore no clothing at all.

Painting by Peter V. Bianchi © National Geographic Society



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# National Geographic Society Presents Russell Cave to the American People

BY MELVILLE BELL GROSVENOR

President and Editor, National Geographic Society

I AM HAPPY to announce to members of the National Geographic Society that Russell Cave—a cross section of 9,000 years of American prehistory—has been presented by your Society to the people of the United States for preservation as a national archeological monument.

Official steps have been taken to make the cave a part of the National Park System, said the Honorable Fred A. Seaton, Secretary of the Interior, in thanking and congratulating The Society "for its generous and farsighted offer."

To the officers and trustees of the National Geographic Society, and I am sure to members everywhere who have followed the reports of these fascinating excavations in their Maga-

zine, this assurance brings profound satisfaction. It guarantees the conservation and wise development of this unique treasury of archeological knowledge for the education and enjoyment of future generations.

For this happy result much credit should go to our friends of the Smithsonian Institution—notably to its Secretary, Dr. Leonard Carmichael, and Dr. Matthew W. Stirling, who brought the cave to the attention of The Society's Research Committee as a worthy subject for investigation, and to the expedition leader, Carl F. Miller.

Almost at once it became apparent that here was a discovery of major importance, and to safeguard the cave the National Geographic Society in 1956 purchased the entire 262-acre farm on which it is situated.

Now the site containing this limestone cavern in Jackson County, Alabama, where Early Man's campfires flickered at least 90 centuries ago, will take its place in the National Park System alongside other priceless possessions to whose preservation your Society has been privileged to contribute.

"For more than 40 years the Park Service and The Society have worked together to preserve America's priceless heritage," National Park Service Director Conrad L. Wirth recalled recently. Among specific examples he mentioned the Valley of Ten Thousand Smokes in Alaska, Carlsbad Caverns and Pueblo Bonito in New Mexico, and the giant sequoias of California.

"Russell Cave," he observes, "has taken a unique place in the treasury of America's past. And now, thanks to the vision of the National Geographic Society, it will rank high among the treasures being safeguarded for America's future."

438



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
OFFICE OF THE SECRETARY  
WASHINGTON 25, D. C.

JAN - 9 1958

Dear Dr. Grosvenor:

It is a great pleasure for me to thank and congratulate the National Geographic Society for its generous and farsighted offer to donate to the people of the United States, Russell Cave, Alabama, and adjacent acreage suitable for its establishment as a national monument.

The continuous and unique record of human occupation of Russell Cave for over 9,000 years makes this site one of the most important scientific archeological areas east of the Mississippi River.

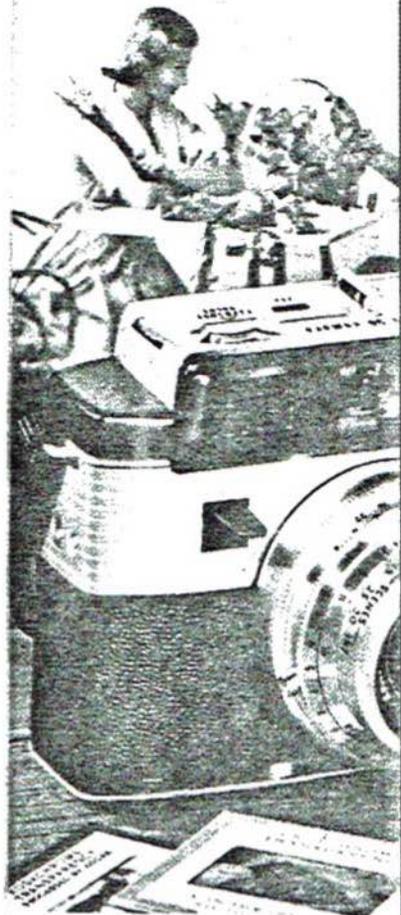
The Advisory Board on National Parks, Historic Sites, Buildings and Monuments, considers Russell Cave to be of national significance. Upon the Board's recommendation and that of Director Conrad L. Wirth of the National Park Service, the Department of the Interior has initiated those official steps required to bring about the establishment of Russell Cave as a unit of the National Park System.

It is a great privilege to cooperate with you and the National Geographic Society in achieving so important an undertaking.

Sincerely yours,

*Fred A. Seaton*  
Secretary of the Interior

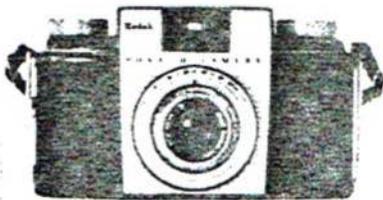
Dr. Melville Bell Grosvenor  
President, National Geographic Society  
16th & M Streets, N.W.  
Washington 6, D.C.



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WHETHER you've taken color hundreds, or have yet to try one—you'll be a better photographer with the new Kodak Signet 50 Camera.

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RUSSELL CAVE NATIONAL MONUMENT  
CAVE SHELTER ECHINID

*Taped Message*

Excavations were dug by archaeologists in an effort to learn about the prehistoric Americans who used this cave as a shelter. To uncover evidence of these ancient peoples they slowly removed the dirt in one-foot levels within five-foot squares. Shovels, trowels and even brushes were used, and excavated dirt was sifted through fine mesh screens. In this manner bones, tools, weapons and ashes of ancient fires were discovered, revealing evidence that early man had used this cave for more than 8,000 years.

EARLY ARCHAIC PERIOD 6,500 B.C. - 4,500 B.C.

Our story begins on the rough, solid rock floor of the cave, just below where you now stand. Picture a small group of Indians crouched around a fire, roasting meat from the day's hunt. By dating charcoal from their fires we know that they burned about 6,500 B.C. Bones scattered nearby indicate the meat was wild turkey, deer, or perhaps a species of wild pig.

These early Archaic people were semi-nomadic hunters and gatherers who had learned to use a variety of plants and animals for food. Instead of a wandering life following game, they had begun to lead a more settled life, close to sources of native food and water. Their tools were few. Bone awls and needles as well as chipped stone tools for scraping hides indicate the use of animal skins for clothing and perhaps for crude shelters.

MIDDLE ARCHAIC PERIOD 4,500 B.C. - 3,500 B.C.

During the 6,000-year span of Archaic Time, changes in their way of life were few, but recent archeological studies revealed that the shapes of the chipped stone dart points used with the "atlatl", or spear thrower, tell a story of change which falls in a definite pattern - site after site. The varied types of weapon points found at Russell Cave enabled archeologists to divide this long Archaic time into several periods.

In the course of excavations a number of human burials were found. At this level were the remains of a young woman. The knees were drawn to the chest in the "flexed" position, a custom which some regard as having religious significance.

LATE ARCHAIC PERIOD 3,500 B.C. - 500 B.C.

Next came a period of experimentation - of borrowing and combining ideas and techniques for gaining a living and for developing tools. One innovation of this time was use of ground or polished stone implements, in addition to their chipped tools.

and most of this level were dug during the 6,000-year period that archeologists call "Archaic". Most of man's time on earth has been lived in the "Archaic" way, wherein he advanced very slowly, and changes in his patterns of living were few.

EARLY WOODLAND PERIOD 500 B.C. - 200 A.D.

By 500 B.C. the way of life began to change at Russell Cave. Little is known of the Early Woodland Period, but the introduction and use of crude pottery vessels at this time was a major step forward.

MIDDLE WOODLAND PERIOD 200 A.D. - 1,000 A.D.

In this period change occurred more rapidly. Introduction and use of the bow and arrow made it easier to obtain meat than with the primitive spear-thrower. The growing of corn, beans and squash provided a more stable food supply. Farming also brought about settlement in one place for longer periods, and resulted in the organization of village communities and wide-spread trading. This easier way of life gave prehistoric families more time for arts, crafts, and development of significant religious observances.

ADVANCED FARMERS 1,000 A.D. - 1,500 A.D.

During the period of the Advanced Farmers, starting about 1,000 A.D., use of Russell Cave was sporadic. This was the age of intensive agriculture, when large farming towns developed along the Tennessee River, and only occasional hunters or trading parties stopped here.

These were the conditions when the Europeans first arrived in America. This part of Alabama was historically Cherokee Indian land until 1816. Within the first few inches of the cave floor were found relics of Indian life from recent historic times.

There remain many unanswered questions about these people. Archeologists are still studying over two tons of material taken from this pit. Future excavations will undoubtedly provide even more study material, but the full story of prehistoric man at Russell Cave may never be completely known.

Thousands of years ago nomadic bands of Indians, hunting in the vicinity, stumbled upon Russell Cave in the hill country of northern Alabama. We know little about them except that they were few in number, probably less than 15 or 20, and that the only durable possessions they carried with them were a handful of chipped flint points with which they tipped their short hunting spears. These few possessions were found 12 feet below the present floor of the cave.

This evidence, supported by charcoal from their campfires, tells us that about 9,000 years ago, long before the rise of the first true civilizations of Egypt and the Near East, these Archaic Period Indians first began to occupy Russell Cave. They lived there only during the autumn and winter seasons, maintaining their primitive existence by hunting game and gathering wild plants. Agriculture was probably known, but little used by the Indians of the Archaic Period.

The cave was a great boon to these Indians because it provided ready protection from the elements. This freed them from the need, to build a shelter in the forest and gave them more time to find food. Successive bands of hunters with their women and children took shelter in this cave until A.D. 1000. The records of their seasonal occupations, including several burials of adults and children, have been uncovered by archeological digs. The charcoal from their fires, the bones of the

animals they ate, the tools they fashioned from animal bones, their spear and arrow points, and their broken pottery had accumulated layer upon layer as the years, the thousands of years, passed.

When the last occupants departed, a thousand years after the birth of Christ, Russell Cave held beneath its surface the record of at least 9,000 years of human life upon this continent.

The first of these relics were not discovered until 1953 when four members of the Tennessee Archeological Society began digging in the cave. As they dug deeper, they realized that the importance of their find demanded more intensive efforts than they could give. They then discussed their discovery with the Smithsonian Institution in Washington, D.C., which conducted three seasons of archeological explorations in close cooperation with the National Geographic Society. Further excavations were carried out in 1962 by the National Park Service. From all this work has come our knowledge of the Indian occupations of Russell Cave.

#### **INDIANS FIND SHELTER IN THE CAVE**

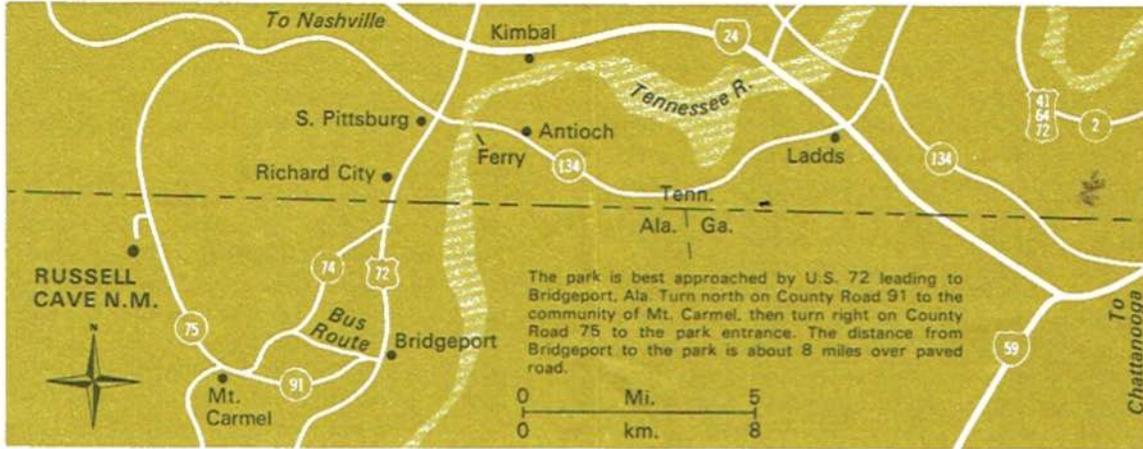
About 9,000 years ago, some 4000 years before the Egyptians built their Great Pyramid, the first Indians made campfires in Russell Cave. They could not have lived there earlier, because a stream of water filled the whole cavern until a great rockfall from the roof shunted the stream to one side and raised the floor of the cave well above its waters.

The first party of cave dwellers camped on the irregular floor of rock slabs. Archeologists have been able to date the arrival of these people at some time between 6550 and 6145 B.C. by measuring the radioactive carbon remaining in the charcoal of their fires. Russell Cave was a seasonal haven for these early forest-dwelling Indians. They survived by hunting and gathering wild plants in the great hardwood forests of the region. After they had depleted the supply of animals and edible plants in one area, they would move on to another section of the forest.

Probably a number of related families used the cave as a place of shelter and safety mostly in the autumn and winter. The relative warmth of the cave probably prevented the stream from freez-

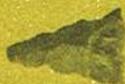
ing and thus they had a constant supply of water. The forest bore a rich crop of nuts that must have been an important source of food during the worst winter months when game in this mountain-valley country was scarce. In spring and summer, small bands—several families—probably camped along the shore of the Tennessee River only a few miles from the cave. Fish, birds, and small mammals could be obtained in the river environment.

Studies in historical geology and paleobotany have shown that the plant and animal life of the Eastern Forest Region remained virtually unchanged for thousands of years, until European settlers felled the trees for lumber and opened up extensive acreages for subsistence and commercial farming.





arrowpoint



## MISSISSIPPIAN PERIOD

After A.D. 500. Large towns with dependent villages, political centralization and warfare between rival groups. Fulltime specialists in crafts, trade, and warfare. Hierarchy of chiefs, priests, and warriors. Widespread trade in raw materials and finished products, contact with civilizations in Mexico. Russell Cave used only intermittently as a shelter.

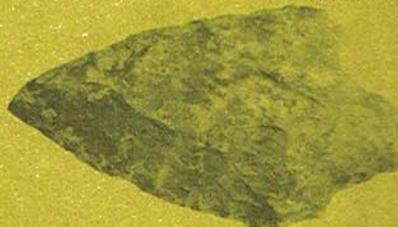
spearpoint



## WOODLAND PERIOD

1000 B.C. to A.D. 500. Beginnings of settled village life and growing importance of individuals with ranks of chief, priest, and chief warrior. Introduction of pottery-making and trade with other groups for materials such as shell and native copper and for finely finished stone tools and other items. Russell Cave used as a hunting campsite during winter months when stored food in the villages was low.

spearpoint



## ARCHAIC PERIOD

7000 B.C. to 1000 B.C. Russell Cave is home to a small band or extended family (a set of parents with their children, the spouses of their children and their grandchildren); hunting and trapping of wild game from deer to squirrels, gathering and use of a wide variety of wild plants as food.

**A.D. 1300** Mexica people build Tenochtitlan on an island in the Valley of Mexico, c1345 A.D. A capital of the Three-City League, later of the Aztec Empire.

**A.D. 1066** Battle of Hastings. Norman conquest and the founding of the English nation.

**A.D. 900** Beginning of first North American city. Cahokia, Illinois. Trade center, many plazas.

**A.D. 300** Classic Maya culture in Mesoamerica, c300 to 900 A.D. Accurate calendar, large cities, glyphic writing system. Regular trade with Teotihuacan.

**400 B.C.** Beginning of city of Teotihuacan in the Valley of Mexico. Extensive trade contacts with all Mesoamerica.

**500 B.C.** Towns, trade and complex religious cults in Peru, c1200 to 500 B.C.

**800 B.C.** Greece and Rome. First Olympiad, beginning date for the ancient Greeks, 776 B.C. Legendary date of founding of Rome, 753 B.C.

**1000 B.C.** Olmec civilization on the Gulf Coast of Mexico. Elite hierarchy, pyramids, trade.

**1200 B.C.** Fall of Troy (Ilium) c1220 B.C., source of material for Homer's *Iliad* and *Odyssey*.

**1700 B.C.** Shang Dynasty in northern China, c1750 B.C. to 1100 B.C. Cities, irrigation agriculture, ancestor-oriented ceremonies, silk, writing, and elaborate government, use of money in wide trade.

**2000 B.C.** Stonehenge, England, construction in three phases c2750 to 1600 B.C.

**3000 B.C.** Settled agricultural communities widespread throughout Europe and Near East. First farming villages in Mexico and South America, c2000 B.C. First Dynasty founded in Egypt by Menes, c3000 B.C. Farming villages in China, Thailand c4000 to 3000 B.C.

**8000 B.C.** First farming villages in Near East c7500 B.C. Domestic animals include sheep and goats. Earliest known pottery in Japan c7500 B.C. Early forms of gardening in Thailand c7000 B.C.

**10,000 B.C.** Hunting and gathering widespread as a way of life throughout the world. Total world population approximately 10,000,000 people.

## ARCHAIC PERIOD (7000 to 1000 B.C.)

The groups of Indians who stayed at Russell Cave from 7000 to 1000 B.C. continued to live by hunting and gathering wild plants. Deer was most commonly hunted, but turkey was also a favorite and easier to kill. Other quarry were squirrel, raccoon, rabbit, gray fox, skunk, and bobcat. Porcupine bones, no longer found this far south, appear in the digs at the earliest occupational levels. Turtles, fish, and shellfish also were eaten.

These early cave dwellers wasted very little of their game. Flesh was roasted, or stewed in containers of bark or skin. Water was heated by dropping hot rocks into it. Hides were made into clothes for protection from rain, snow, and cold. Bones were made into tools of several kinds.

During the autumn and winter, when the cave was occupied, plant foods such as fruits and berries were scarce or unavailable. Nuts and seeds became the staple fare.

A short spear, tipped with a stone point and propelled by an atlatl, or throwing stick, was the chief weapon of these hunters. They chipped the points from chert, which occurs as hard nodules and veins in the limestone near the cave. The many chips dug up indicates that the Indian men fashioned the sharp, hard projectile points in the cave.

The few tools they used reflect the limited needs of these people and the necessity for their household goods to be portable. The men chipped the sharp, flinty stone chert into scrapers and knives. They turned bones into awls and needles, which suggests they worked hides into items of clothing. They also made pieces of bone into fishhooks. No ornaments have been found in these deposits.

The Indians probably made other articles that the soil has not preserved. Basketry and items of wood and hide have long since disappeared. One piece of evidence pointing to the use of perishable material was the discovery of impressions of cane matting on a clay "floor" deep in the Archaic deposits.

Occasionally the Indians buried members of their family inside the cave. Several burials of adults and children have been found in shallow pits scooped out of the cave floor. No artifacts were found with these burials.

Some scraps of evidence hint that during the last 3,000 years of this long Archaic Period, when the cave may have been less frequently occupied, these Indians of the Tennessee Valley relied on the food resources of the river for their chief source of sustenance. But in most other respects, the Russell Cave Indians maintained the same way of life unchanged.

## WOODLAND PERIOD (1000 B.C. to A.D. 500)

Archeological excavations reveal that, beginning about 1000 B.C., the implements of the Indians using Russell Cave underwent a dramatic change. Pottery appears for the first time, and in quantity. Smaller weapon points suggest that the bow and arrow had replaced the earlier throwing stick. Bone tools were more finely finished, and there was a variety of bone and shell ornaments.

These changes widespread at this time among the Indian groups of the eastern United States, mark the beginning of the Woodland Period of Indian culture. It was during this period that burial mounds were first built, population increased, and trade of numerous items became important.

The richer and more complex lifestyles indicate that the Woodland Period Indians had more time for activities not directly concerned with staying alive. Probably a stable and more abundant economy based on agriculture supported their culture. The mounds are also a sign that the Indians in the region of Russell Cave had increased in numbers and that their culture had matured to the point of having political and religious institutions. These must have been well developed and in strong control of the people—sufficient control to keep them at work for long periods building the mounds.

In this period small groups of Indians used Russell Cave only as a winter hunting camp. When they left the cave, in the spring, they probably joined other groups at a summer village that was larger than those of the Archaic Period.

The basis for cultural subdivisions within the Woodland Period are the changes in the shape and style of artifacts at Russell Cave. For example, the early pottery of this period has surfaces decorated with fabric impressions. The later pottery is decorated with impressions made by wooden paddles that were carved into a variety of designs. The shapes of arrowpoints also changed during the period.

## MISSISSIPPIAN PERIOD (after A.D. 500)

From archeological evidence we know that shortly after the close of the Woodland Period (A.D. 500) Indians made less and less use of Russell Cave. Occasionally small parties, probably hunters, left a scattering of objects that differed from those of the Woodland Period occupants. They came from permanent villages built near the rich river bottomlands, and their fields yielded bountiful crops of corn and other plants. They were the Mound Builders of the Mississippi Period.

Centuries later, the Cherokee Indians occupied this part of the Tennessee Valley. They, and the European settlers who followed them, made little use of the cave. The few objects they left were found very close to the surface.

## ABOUT YOUR VISIT

The park is open all year. Exhibits are in the visitor center, and an exhibit of the archeological excavation is in the cave. There are no camping facilities. Help preserve the natural and archeological scene.

Entrance into cave passages, except at the archeological exhibit, is allowed only with written permission of the superintendent.

Demonstrations are presented on the life of the ancient Indians covering: use of the atlatl (throwing stick), grinding of corn, cracking of walnuts, flaking of flint to prepare stone tools, cutting of leather thongs, and cooking by heat transfer.