

The Development of Advanced Woven-Fiber Technology in the Paleolithic Era

Insights from Paleo-Indian artifacts and Ethnoarchaeology
By Rick Doble



"Basket, Apache people, Arizona, ca. 1900,
coiled willow and devil's claw - Chazen Museum of Art."

<[https://commons.wikimedia.org/wiki/File:Basket, Apache people, Arizona, c. 1900, coiled willow and devil%27s claw - Chazen Museum of Art - DSC01849.JPG](https://commons.wikimedia.org/wiki/File:Basket,_Apache_people,_Arizona,_c._1900,_coiled_willow_and_devil%27s_claw_-_Chazen_Museum_of_Art_-_DSC01849.JPG)>

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ABSTRACT:

It is my contention that by the Upper Paleolithic, many technologies were quite advanced. In particular, basket weaving or woven-fiber technology had reached a high point of development. A variety of basket weaving techniques had been mastered along with the manufacture of cordage and the beginnings of textiles. This knowledge and these skills were then passed on to Neolithic cultures who were able to make full use of these technologies in their sedentary and agricultural societies. Basket weaving or woven-fiber technology was a central technology all during the Pre-Pottery A & B Neolithic time period, a time period that lasted much longer than the later Pottery Neolithic. Furthermore, even after the invention of pottery, basket weaving skills continued to be crucial to both the Neolithic cultures and to the first civilizations.

INTRODUCTION

In the past, the Upper Paleolithic era has been thought of as primitive and unsophisticated, a time of crude cavemen and savages. Today that perception is changing with the discovery of the ceramic Venus of Dolní Vestonice made at least 27,000 years ago and the discovery of rope and rope handling tools dated to about 40,000 BP. But what has still to be uncovered is basket weaving or woven-fiber technology because fibers decay quickly and leave little trace. Impressions on clay have been discovered and confirmed, dating to about 25,000 years ago. The impressions show a technology that was quite advanced including weaving with a loom.



For more than 100 years it was assumed that shaping and then firing clay, known as ceramics and pottery, began in the middle of the Neolithic era (Pottery Neolithic) about 8,500 years ago. The discovery of this Venus figure changed that understanding because it was made in the Upper Paleolithic 27,000 years ago, almost 20,000 years earlier. (Soffer, Adovasio, et al, "Perishable Industries from Dolní Vestonice I")

[<https://commons.wikimedia.org/wiki/File:Vestonicka_venuse_edit.jpg>](https://commons.wikimedia.org/wiki/File:Vestonicka_venuse_edit.jpg)

Since many authorities agree that European Upper Paleolithic and Native American Indian cultures were similar, based on stone tool artifacts, in this article I look at the Indian cultures for evidence since some of their ancient basketry has survived. Then to go further I use the modern method of ethnoarchaeology and well-researched information from 100 years ago about Indian tribal life at that time, which had changed little over time, to show the complexity of their woven-fiber technology and the wide range of products that could be produced.

A MAJOR DISCOVERY THAT HAS CHANGED PEOPLE'S UNDERSTANDING

Before I present evidence I want to 'set the stage' so to speak with information about new discoveries that have changed the way this time period has been viewed.

In the last 30 years, there has been a major shift in attitudes and preconceptions about the Paleolithic era. Starting around 1990 and continuing to today, important discoveries have altered previous ideas regarding the Old Stone Age, the New Stone Age, and the Bronze Age.

For example, technologies and processes that were exclusively associated with the Neolithic era were found in some Upper Paleolithic sites such as ceramics. These discoveries signaled that the 'Age' categories were a bit too rigid and that prehistoric technologies and cultures may have developed in ways and at times that had not been understood.

In particular, in the 1990s a dramatic major discovery got everyone's attention.

GOBEKLI TEPE CHANGES THE CULTURAL EVOLUTION NARRATIVE



A main area that is being excavated.

https://commons.wikimedia.org/wiki/File:Göbekli_Tepe,_Urfa.jpg

In 1995 archaeologist Dr. Klaus Schmidt began excavations in an obscure part of Turkey based on a hunch. What he found was Gobekli Tepe, a 22-acre complex that has so far revealed about 200 of the world's oldest megaliths, carefully carved stones as tall as 16 feet and

weighing seven to ten tons each. Built about 11,000 years ago by hunter-gatherers during the Paleolithic era and before the beginning of agriculture and the Neolithic era, no one had thought that people at this time were capable of creating such a monumental structure. And just as remarkable, all the work was accomplished with stone-age tools.



LEFT: A stone pillar.

RIGHT: An animal carving in stone.

<<https://commons.wikimedia.org/wiki/File:Göbekli2012-7.jpg>>

<<https://commons.wikimedia.org/wiki/File:GobeklitepeHeykel.jpg>>

And while the technology of Gobekli Tepe is awe-inspiring, the implications are just as earth-shaking. Dr. Schmidt called the site the "world's first temple." He saw it as a religious center, "This is the first human-built holy place." It was a "cathedral on a hill."



Aerial views: (left) long shot of main area (see ground photo above) and (right) closeup of this area from above.

<[https://commons.wikimedia.org/wiki/File:The archaeological site of G%C3%B6bekli Tepe - main excavation area.png](https://commons.wikimedia.org/wiki/File:The_archaeological_site_of_G%C3%B6bekli_Tepe_-_main_excavation_area.png)>

The Smithsonian website put it this way, "Gobekli Tepe: The World's First Temple? Predating Stonehenge by 6,000 years, Turkey's stunning Gobekli Tepe upends the conventional view of the rise of civilization."

<<https://www.smithsonianmag.com/history/gobekli-tepe-the-worlds-first-temple-83613665/>>

While controversial, the Smithsonian wrote, "To Schmidt and others, these new findings suggest a novel theory of civilization. Scholars have long believed that only after people learned to farm and live in settled communities did they have the time, organization, and resources to construct temples and support complicated social structures. But Schmidt argues it was the other way around: the extensive, coordinated effort to build the monoliths literally laid the groundwork for the development of complex societies." (Curry, smithsonianmag.com)

MY COMMENT

In other words this seems to imply that societies which became considerably larger than the smaller tribal size of hunter-gatherers, needed a belief system first that they all shared and that formed the foundation of their expanding culture, before they could construct the larger complex villages and towns of the Neolithic era. Tribes were rarely bigger than 100 people while early Neolithic villages could contain 400 people and later ones 4000 people. (Birch-Chapman et al., "Estimating population size, density and dynamics of Pre-Pottery Neolithic villages...")

ABOUT WOVEN-FIBER TECHNOLOGY

In the last thirty years, surprise after surprise about the intelligence and skills of early hominins has completely changed the narrative about human, cultural, and technological evolution. Some technologies in the Upper Paleolithic (circa 40 ka - 20-10 ka) and the Middle Paleolithic (circa 200 ka - 40 ka) were sophisticated and complex.

Baskets made by nomadic hunter-gatherers were constructed with great skill but at the same time, most nomadic tribes did not make pottery. In the past, the development of pottery was seen as an indication that an advanced level had been reached and that the supposedly 'older' and less sophisticated craft of basketry had been surpassed. However, this was a major mistake. Basketry continued to be used, and used more than pottery by some tribes, long after pottery was invented.

I believe that basket weaving and woven-fiber technology developed to a very high level in the Upper Paleolithic and then was passed on to the Neolithic cultures who used it to their advantage to create a sedentary agricultural way of life. Then in the Neolithic era, woven-fiber technology reached a pinnacle of refinement, diversity, and precision. (More about this in my next blog.)

THE PROBLEM WITH BASKETRY

I have quoted the following in many of my articles about basket weaving technology, but the point is crucial. It explains why there is so little direct evidence of basketry and woven-fiber materials.

"In whichever way archaeological remains are interpreted, one must always be aware that the vast majority of the materials with which prehistoric people were surrounded and with which they worked is lost to us today. ...organic materials start to decay as soon as they are deposited in the ground."

Grömer, Dr. Karina. "An Introduction to Prehistoric Textiles"

Brewminate.com, Natural History Museum, Vienna, March 01,

2016, <https://brewminate.com/an-introduction-to-prehistoric-textiles>.

This lack of evidence has, in the past, stymied research into the possibility of early basket weaving technology. But now that people are looking at the Paleolithic and Neolithic eras with a more open mind, there may be a way to make a case that basketry began much earlier

than had been generally thought and that it could have become quite advanced in the Paleolithic period. One way to back up this assertion would be to use the modern method of ethnoarchaeology -- but more about this later in this article.

RECENT EVIDENCE OF WOVEN-FIBER TECHNOLOGY

To begin I would like to highlight recent evidence that confirms an early advanced Paleolithic fiber/plant technology, a technology that involved natural plant materials and woven-fibers. I did not include basketry in this list as I will go into detail about basket weaving technology later in this article.

The following list is in chronological order. I used the most conservative dates that there was general agreement about.

-- HAFTING: 200,000 years ago (200 ka)

Hafting is the processing of joining a stone or bone artifact (and later metal) to a handle or strap such as a stone arrowhead to a wooden spear, or a wooden handle to a stone ax head. This is considered a major advance in tool making that demonstrates an understanding of materials and their properties. (Rots et al., "When does hafting first appear?")

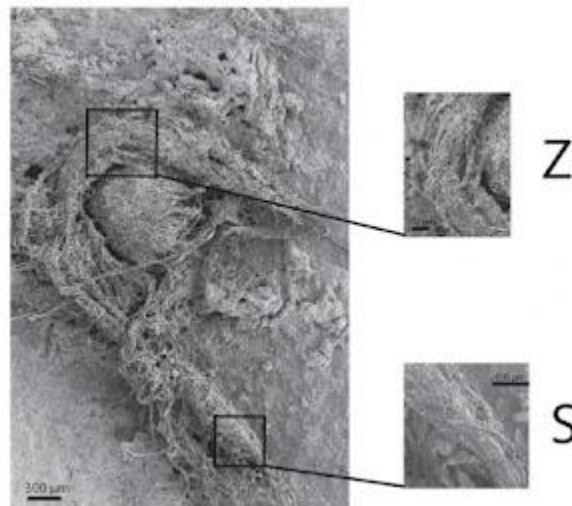
-- BITUMEN: 70 ka

Bitumen when used in combination with plants or fibers was an adhesive often used for hafting and also for sealing and waterproofing baskets to carry water and for sealing the bottoms of reed boats. (Hirst, "Mesopotamian Reed Boats Changed the Stone Age.")

In a study entitled: "New evidence of adhesive as hafting material on Middle and Upper Palaeolithic artifacts from Gura Cheii-Râsnov Cave (Romania)" the researchers concluded that they had discovered bitumen usage by Paleolithic peoples. "All these hydrocarbons [found via chemical analysis] confirm that the black substance is highly weathered bitumen" (Cârciumaru et al., "New evidence of adhesive [bitumen]...on Middle and Upper Palaeolithic artefacts")

-- ROPE: 40 ka

Direct evidence has been found of rope strands from the late Middle Paleolithic. Microscopic photos confirm that sophisticated rope making was taking place before the Upper Paleolithic. (Hardy et al., "Direct evidence of Neanderthal fibre technology...")



<<https://www.nature.com/articles/s41598-020-61839-w>>

-- ROPE MAKING TOOL: 40 ka

For a hundred years, the 'batons' as they were called remained a mystery. Then in 2016 Prof. Nicholas Conard demonstrated that ones with four holes could be used to make rope and in addition that the wear marks on the tools were consistent with rope making. "The discovery underlines the importance of fiber technology and the importance of rope and string for mobile hunters and gatherers trying to cope with challenges of life in the Ice Age." (Universitaet Tübingen. "How rope was made 40,000 years ago.")

-- ROPE HANDLING TOOLS: 40 ka

Similar to the batons with many holes, these smaller 'batons' were studied in-depth and were found to be consistent with wear caused by rope handling. These batons were found throughout Europe and thus showed a widespread knowledge of working with rope. (Lucas et al., "Investigating the use of Paleolithic perforated batons")



<https://commons.wikimedia.org/wiki/File:Baton_Lartet_MHNT_PRE_2010.0.1.2_Global_fond.jpg>

-- LOOMS: 25 ka

It was always assumed that weaving with a loom could not have started before the Neolithic era. Yet the discovery of clay fiber impressions showed clearly that one impression was of a plain weave fabric which could only have been done with a loom. This placed the time period for weaving with a loom in the Upper Paleolithic contrary to widely held century-long assumptions. (Soffer, Adovasio, et al, "Perishable Industries from Dolní Vestonice I")

NOTE: Some researchers consider the loom to be the first man-made machine.

The *Encyclopedia Britannica* defines a loom as a "machine for weaving cloth." <<https://www.britannica.com/technology/loom>>



LEFT: This is a loom of the indigenous Japanese tribe, the Aino (or Ainu). It is a "loom for weaving belts of ohiyo (elm) bark. Single heald; primitive shuttle; sword batten; warp spreader with holes burnt through."

MIDDLE: "Guatemalan woman hand loom 1970s."

RIGHT: "This woman is showing how local textiles are woven. Cusco, Peru."

<https://commons.wikimedia.org/wiki/File:History_of_Inventions_USNM_31_Loom.jpg>

<https://commons.wikimedia.org/wiki/File:Guatemalan_woman_hand_loom_1970s.jpg>

<https://commons.wikimedia.org/wiki/File:Making_Peruvian_Inca_Textiles.jpg>

-- REED & FIBER BOATS: 7 ka

Large seagoing Neolithic boats and boat traffic has been established in the Persian Gulf area. While evidence of 7 ka puts these boats in the Neolithic era, it also suggests that the first small simple reed and fiber boats were made many thousands of years earlier. Boats such as this were certainly possible in the Upper Paleolithic, especially when constructed with bitumen. (Carter, "Boat remains and maritime trade in the Persian Gulf during sixth and fifth millennia BC," pp. 52-63) (Carter, "Neolithic origins of seafaring in the Arabian Gulf," pp.44-47)

"Mesopotamian reed boats constitute the earliest known evidence for deliberately constructed sailing ships, dated to the early Neolithic Ubaid culture of Mesopotamia, about 5500 BCE. Showing an understanding of material properties, a sophisticated mixture was created. "Bitumen caulking of the reed boats was made by applying a

heated mixture of bitumen, vegetal matter, and mineral additives and allowing it to dry and cool to a tough, elastic covering." (Hirst, "Mesopotamian Reed Boats Changed the Stone Age.")



TOP LEFT: "Tankwa or tangwa: Traditional Ethiopian embarcation from Lac Tana, made of papyrus by Nagades people."

TOP RIGHT: "Reed boat at Ekehagen Prehistoric village outside Åsarp, Falköping Municipality, Västergötland, Västra Götaland County, Sweden."

BOTTOM LEFT: "Reed boat; exhibition in the Doria Castle of Castelsardo, Sardinia, Italy"

BOTTOM RIGHT: "Traditional reed boat on Lake Titicaca, Bolivia."

<<https://commons.wikimedia.org/wiki/File:EthiopieLacTanaTankwa.JPG>>

<https://commons.wikimedia.org/wiki/File:Ekehagens_fornstidsby_vassbåt_6790.jpg>

<<https://commons.wikimedia.org/wiki/File:Castelsardo-016.jpg>>

<[https://commons.wikimedia.org/wiki/File:Bolivia-130_-_Reed_Boat_\(2218109064\).jpg](https://commons.wikimedia.org/wiki/File:Bolivia-130_-_Reed_Boat_(2218109064).jpg)>

Archaeologists assume that, when they find a sophisticated item, the skill for making this item must have started many thousands of years earlier. So it appears from the examples discussed here that a large number of technologies may have developed at an early stage in the

Paleolithic period, including the Middle and perhaps even the Lower Paleolithic.

ABOUT BASKET WEAVING TECHNOLOGY IN THE PALEOLITHIC ERA

POSITIVE PROOF OF WOVEN-FIBER/BASKET TECHNOLOGY IN THE PALEOLITHIC

In 1995 at the *Society for American Archeology*, Dr. Olga Soffer of the University of Illinois at Urbana and Dr. James M. Adovasio of Mercyhurst College in Erie, Pa. announced they had found pieces of clay with clear impressions of the earliest fabric artifacts -- the first to be confirmed from the Paleolithic time period. Since the impressions were so small they could not tell whether these were from textiles or from baskets. The leading world paleo-fiber expert, Dr. Adovasio, confirmed the find.

This one discovery pushed back the beginnings of these 'soft' technologies about 10,000 years well into the 'old stone age' and well beyond the Neolithic or 'new stone age' when everyone in the field had assumed that basketry, textiles, and weaving had begun. These new findings have now been dated to at least 25,000 years ago.

When the clay impressions were examined closely they revealed at least two different weaving techniques. Dr. Adovasio commented that the regularity of the weave and the 'narrow-gauge' indicated that the technology was quite advanced so that the origins of weaving had to be much earlier.

OLDEST DIRECT EVIDENCE OF BASKETRY

The oldest direct evidence of baskets was found in Faiyum in Upper Egypt. Basket fragments have been carbon-dated to between 10 ka - 12 ka. (Erdly, History, Basket Weaving.) This is much earlier than pottery. Archaeologists believe that pottery was too heavy and breakable for mobile hunter-gatherers. (Diamond; Guns, Germs, and Steel, p. 261)

Thousands of years later, "In the Fayum Oasis... grain storage pits were excavated in the desert floor, lined with coarse straw basketry." "Both the coarse basketry pit-lining and the very fine, decorated baskets found near or inside some of the pits demonstrate that there was a basketry tradition, with objects made from readily available local materials." (Wendrich, "Basketry in Ancient Egypt")

IN 2021 THE WORLD'S OLDEST COMPLETE BASKET WAS DISCOVERED & DATED TO 10,500 YEARS AGO

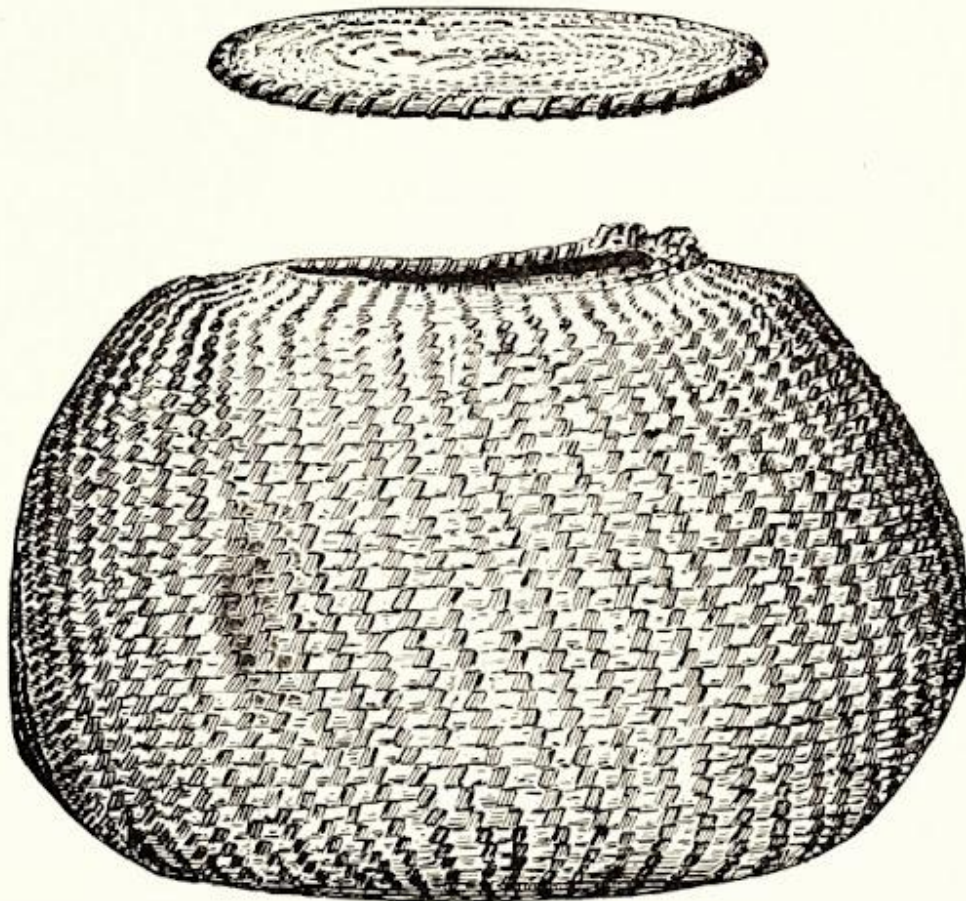


FIG. 203.
COILED GRANARY.
Pima Indians.
Collected by Edward Palmer.

The newly discovered basket in Israel looks remarkably like this large Native American Indian one which was also used for storage and had similar lids.

Coiled Granary, Pima Indians
(Aboriginal American Basketry, 1904, Fig. 203, p. 524)

While many discoveries have been made in the last thirty years, none are more important to woven-fiber technology than the following in early 2021.

Just last year, on March 16, 2021, the Israel Antiquities Authority (IAA) announced that a perfectly preserved large woven basket dating back

some 10,500 years was unearthed in the Judean Desert. And lids for the basket were found as well.

"As far as we know, this is the oldest basket in the world that has been found completely intact and its importance is, therefore, immense," the IAA said.

The basket could hold about 92 liters. But according to Dr. Haim Cohen of this IAA project, the ancient people who manufactured it probably did not live in the cave, but instead used it for storage.

The Judean desert possesses the perfect climate for preserving materials that would otherwise disintegrate.

While there is still plenty to be learned, this much is known: the basket was made from woven reeds and it took two people to weave it.

See this video:
Thrilling finds have been uncovered
by the Israel Antiquities Authority in the Judean Desert
<https://www.youtube.com/watch?v=y1Aty1O-j_A>

ABOUT THIS IMPORTANT DISCOVERY

The Israel Antiquities Authority believes this basket was from the early Pre-Pottery Neolithic but the dating places it on the cusp of the Neolithic and the time period before that. In any case, it is clear that this sophisticated basket technology must have begun thousands of years earlier during the Paleolithic era as I have suggested.

It is important to note that it was probably used for storage and looks very similar to the Native American Indian basket shown above and made for the same purpose. And it was built with a right-angle or opposing strand construction (see the video) which I have also written about in an earlier blog-article.

A NEW PAIR OF EYES

Dr. Adovaso and Dr. Soffer sum up this new way of looking at past eras very nicely in this quote:

"Finally, the identification of textiles and basketry ca. 25,000 B.P., together with extensive evidence of Upper Paleolithic ceramic

technologies (Vandiver et al. 1990), raise serious questions about the technological “signatures” or artifactual associations used to define particular epochs in prehistory. The Moravian sites are by chronological assignation clearly Paleolithic and not Neolithic in age, preceding the “Neolithic Revolution” (Childe 1936) by some 15,000 years. They were occupied by people who subsisted by foraging, not by horticulture, and whose settlement systems, as a result, featured residential mobility rather than year-round sedentism. Yet, these populations produced geometric microliths, made ceramics, manufactured ground stone tools, and wove textiles and basketry, all supposed “hallmarks” of the Neolithic.” (Soffer, Adovasio, et al, "Perishable Industries from Dolní Věstonice I")

ETHNOARCHAEOLOGY, THE EUROPEAN UPPER PALEOLITHIC ERA, AND NATIVE AMERICAN INDIAN CULTURE

THE SIMILARITY BETWEEN PALEOINDIAN AND UPPER PALEOLITHIC

Using the modern idea and methods of "ethnoarchaeology" which is "the branch of archaeology that studies contemporary primitive cultures and technologies as a way of providing analogies and thereby patterns for prehistoric cultures," (dictionary.com) I looked at studies of Native American Indians whose way of life was well documented about 100 years ago. A number of tribes were nomadic hunter-gatherers but made superb baskets, such as the Apache. The Smithsonian Institute in particular did extensive studies about Indian cultures (see next).

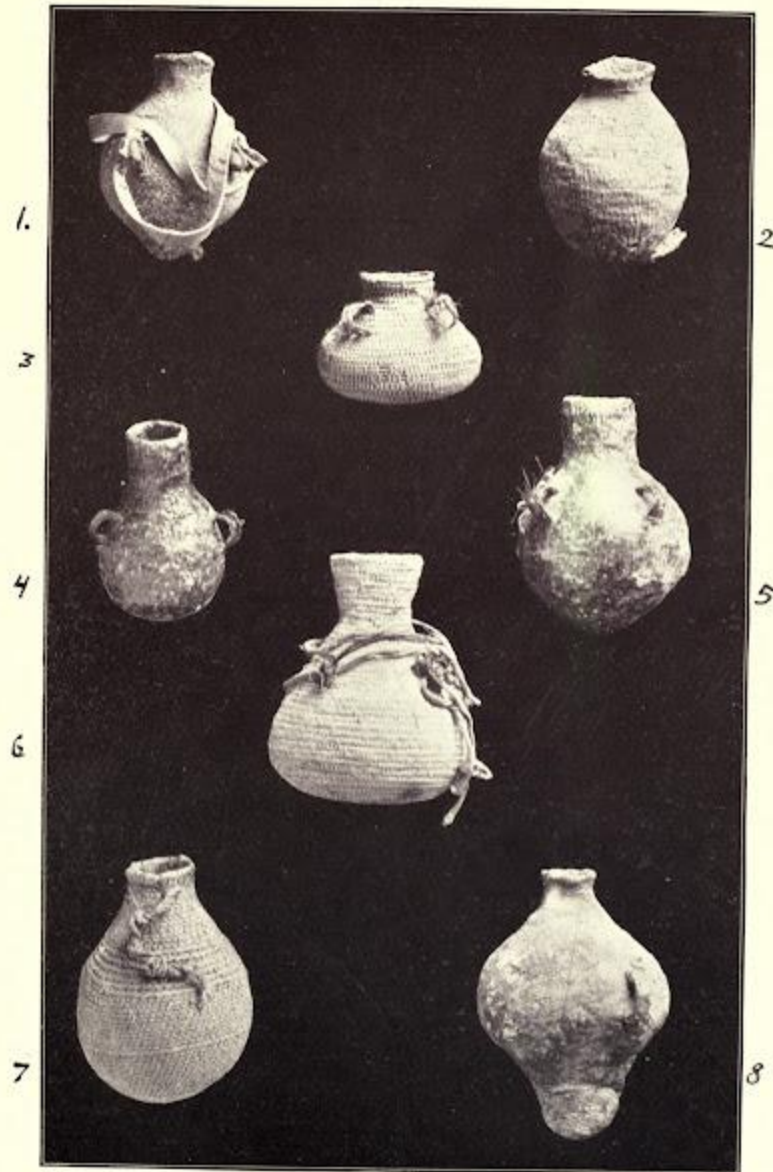
Explaining the similarity of Upper Paleolithic cultures in Europe and North America, Hyland et al. wrote:

"Systematic visual and microscopic examination of impressions on these [excavated] Far Eastern ceramics [Eastern European Upper Paleolithic impressions in clay] reveals the presence of a sophisticated plantfiber-based perishable technology. Interestingly, the technological types represented in this assemblage **PRECISELY MIMIC THOSE RECOVERED FROM THE EARLIEST LEVELS OF A NUMBER OF WESTERN NORTH AMERICAN SITES** [ED: my emphasis] and may represent the prototype for this venerable industry as expressed in the New World." (Hyland et al., 2002, p. 1)

**There are "technological similarities between European Upper Paleolithic artifacts and 13,000-year-old Native American artifacts."
(Pennsylvania Archaeology, Paleoindian Period)**

So there was a clear similarity between European Upper Paleolithic and ancient Native American Indian stone artifacts. But because these Indian cultures continued to exist until a more recent time in North America there were large numbers of fiber artifacts and baskets that also survived (unlike Europe). Since it appeared that the Indian basket-weaving culture and the Upper Paleolithic way of life were similar, baskets could have been a key technology of the European Upper Paleolithic as well.

One specific example is that of ancient water-tight baskets.



ANCIENT BASKET BOTTLES.
SOUTHERN INTERIOR BASIN. SEE PAGE 258.

"Major J. W. Powell, during his topographical and geological survey of the valley of the Colorado River of the West...made a collection of water-tight basket work from the Paiute Indians [ED: nomadic hunter-gatherers]...Both coiled and twined work are found in great varieties. Plate 32 represents the varieties of these water-tight carrying jugs or bottles."

(Aboriginal American Basketry, 1904, Plate 32, explanation p. 258)

Unfortunately, we cannot know the exact dates of these pictured 'ancient' water-tight basket bottles but they were made with both twining and coiling methods. It appears reasonable to conservatively place them in the 8,000 to 1,000 BP time period but they could be older.

----- ABOUT DATING -----

"Coiled basketry dates to more than 8,000 years ago in the Eastern Great Basin and is found in the Western Basin by 4,500 years ago." (Connolly, "Implications Of New Radiocarbon Ages On Coiled Basketry From The Northern Great Basin.")

"Before the appearance of coiled basketry there was an early use of simple twined basketry (11,000 to 7,000 BP) and a more complex use of twining (7,000 to 1,000 BP)." (Connolly et al., "Radiocarbon Evidence Relating to Northern Great Basin Basketry Chronology.")

"The tribal peoples now living in the Great Basin are descendants of the people who have been in the region for several hundred to several thousand years." (National Park Service, "Historic Tribes of the Great Basin.")

"There is no reason for believing that the ancient ware differed from the modern. In the Interior Basin also baskets are used [instead of]...pottery by tribes that are not sedentary." (See Plate 32.) (Aboriginal American Basketry, 1904, p. 258-259.)

BASKET WEAVING'S IMPORTANCE IN NATIVE AMERICAN CULTURE

"Basket Weaving's Importance In Native American Culture:

"One of the oldest crafts in Native American cultures is basket weaving. Each tribe has its own Native American specific methods and materials to create woven baskets...In fact, basket weaving can be traced back to the beginning of mankind.

"In a world where there were no cupboards, plates, or bowls to hold your belongings, baskets served as indispensable items that had multiple purposes. They allowed people to carry water, [wear] clothing, [gather and cook] food, and much more.

"In Native American cultures, baskets took the place of every modern convenience we take for granted and also served as a representation of tribes and stories." (Kachina House)

Basket-weaving skills were central to many if not most Native American Indian cultures. "Tribal women provided almost all household tools and

utensils, storage containers, cups, and cradles by using one art: basket weaving." (Boule, 1992, p. 38)

The Smithsonian publication made this clear:

"Basketry supplied nearly every domestic necessity of the Indians, from an infant's cradle to the richly decorated funerary jars burned with the dead. The wealth of a family was counted in the number and beauty of its baskets and the highest virtue of woman was her ability to produce them." (Aboriginal American Basketry, 1904, p. 335)

The following is quoted from the Smithsonian's Aboriginal American Basketry of 1904, pp. 197-198. You can download the entire book from the address listed below.

Full Citation: Aboriginal American basketry: studies in a textile art without machinery. Contributors: Mason, Otis Tufton; Coville, Frederick Vernon. Annual Report of the Board of Regents of the Smithsonian Institution; Report of the U.S. National Museum. Washington: Government Printing Office, 1904. <https://archive.org/details/aboriginalbasket00masorich>. Accessed 12/10/2020.

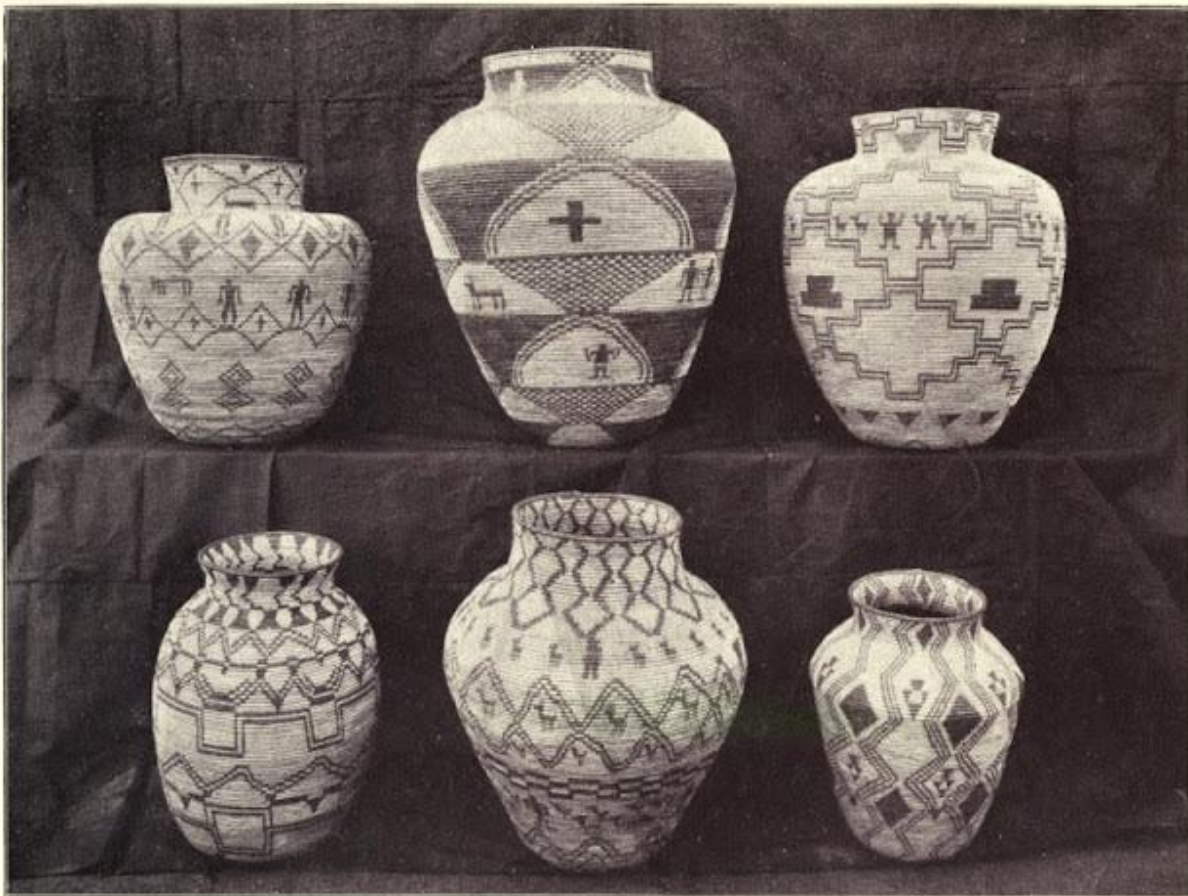
NOTE: The language in the Smithsonian's Aboriginal American Basketry of 1904 is horribly outdated. The word 'savage', for example, is often used. Nevertheless, the document expresses respect and an understanding of the remarkable Indian culture which was quite unusual at the time. It is one of the most complete books on the subject of American Indian basketry and also the way that basketry was a critical part of life in the many hunter-gatherer Indian tribes.

"The chief dependence, however, of the basket maker is upon the vegetal kingdom. Nearly all parts of plants have been used by one tribe or another for this purpose roots, stems, bark, leaves, fruits, seeds, and gums. It would seem as though in each area for purposes intended the vegetal kingdom had been thoroughly explored and exhausted above ground and underground.

"Is it not marvelous to think that unlettered savages should know so much botany? Mr. Chesnut, in his Plants used by Indians of Mendocino County, California, calls attention to the fact that in our advanced state we are yet behind these savages, not having caught up with them in the discovery and uses of some of their best textile materials.

"How did the savages find out that the roots of certain plants hid away under the earth were the best possible material for this function* And for another use the stem of a plant had to be found, perhaps miles away, so that in the makeup of a single example leagues would have to be traveled and much discrimination used. Unless the utmost care is exercised the fact will be overlooked that often three or four kinds of wood will be used in the monotonous work of the weft. One is best for the bottom, another is light and tough for the body, a third is best for the flexible top. This in addition to the employment of half a dozen others for designs, for warp or foundation, or for decorative purposes." (Aboriginal American Basketry, 1904, pp. 197-198)

**THE FOLLOWING PICTURES
ARE OF OBJECTS MADE WITH BASKET WEAVING TECHNOLOGY
BY NATIVE AMERICAN INDIAN NOMADIC HUNTER-GATHERERS**



APACHE COILED OLLAS.

Apache coiled ollas (jars)
(Aboriginal American Basketry, 1904, Plate 42, explanation p. 285)



CHEMEHUEVI COILED BASKETS.

Chemehuevi coiled baskets

(Aboriginal American Basketry, 1904, Plate 232, explanation p. 519)



FIG. 185.

CARRYING BASKET.

Paiute Indians, Utah.

Cat. No. 10067, U.S.N.M. Collected by J. W. Powell.



LEFT: Carrying Basket, Paiute Indians, Utah.

(Aboriginal American Basketry, 1904, Fig. 185, p. 494)

RIGHT: "Apache Indian woman carrying a "Kathak" on her back, Arizona, ca.1880."
(University of Southern California, ca.1880, Apache Indian woman carrying a "Kathak")
<<http://digitallibrary.usc.edu/cdm/singleitem/collection/p15799coll65/id/3668/rec/4>>.



"Apache Indian maiden with an olla on her head, ca.1900."

(University of Southern California, ca. 1900, Apache Indian maiden)

<<http://digitallibrary.usc.edu/cdm/singleitem/collection/p15799coll65/id/16137/rec/78>>.

MATERIAL SOURCES

While I run the risk of going into too much detail in this part of this article, I need to make the point that well-made baskets were a highly-developed technology. If you are not familiar with basketry you might assume that it is simple and mundane. We are all familiar with the jokes

about the absurdly simple college course in "underwater basket making" which could not be more wrong.

From the Burke Museum, (UW College of Arts & Sciences), Teacher's Guide For Basketry, Northwest Coast Basketry:

"Materials used in basketry vary, depending upon the type of basket being made, its intended function, the tastes of the maker, and the materials available. A basket used for heavy loads would use stiff, sturdy material such as cedar withe or cedar root. A container made to fold flat requires flexible material such as spruce root.

"Some of the more common materials used in basketry include cedar bark, cedar root, spruce root, cattail leaves, and tule.

GATHERING AND PROCESSING THE MATERIALS

"Most raw materials used in weaving are harvested or gathered at specific times of the year. This ensures that the materials are collected when they are best suited for weaving. Weavers understand the growing cycles of the natural materials they use and recognize when a tree or plant is ready for harvesting. Often, special prayers are said or songs are sung by the weaver while she gathers and processes her materials.

"Most materials are collected in the spring or early summer. This includes grasses, which must be picked at just the right time. If it is too early in the season, certain grasses are too soft or narrow for weaving. Other kinds, such as reed canary grass, need to be harvested before the plant blooms.

"Pioneering work by Conklin (1957) and others documented that traditional peoples...often possessed exceptionally detailed knowledge of local plant and animals and their natural history, recognizing in one case some 1,600 plant species." (Inglis, 1993)

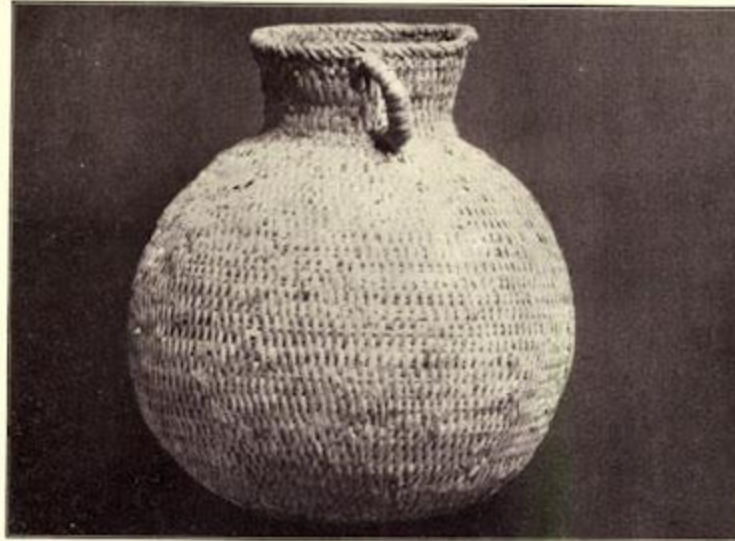
Instead of thinking that basketry was incompatible with a nomadic hunter-gatherer lifestyle, the truth may be the opposite. These societies needed well-designed light, strong, durable, flexible, versatile, and portable basket items and implements that they could carry with them as they traveled. And they needed to be able to make baskets from whatever plants they found as they moved around -- plants that women were experts at harvesting. So baskets fit well with their mobile way of life.

USING BITUMEN WITH BASKETS AND FIBERS

**"The use of asphaltum [another name for bitumen] by aboriginal peoples is well documented in early historic accounts and abundant archeological evidence extends its use well back into the prehistoric era. Asphaltum was the caulk, glue, and paint...: when heated, the viscosity decreases, and the molten asphaltum can be applied, cooling to form a jet-black, waterproof coating, an adhesive or a decorative paint."
(Calhoun, 1964)**

MAKING WATERPROOF BASKETS AND CANTEENS

The woman "making such baskets, [was] distributing the pitch over the inside of the receptacle by placing lumps of asphaltum in the basket with hot stones and shaking the whole with a rotary motion, causing the melting asphaltum to be distributed evenly over the surface." (Barrows, 1900, p. 41)



SOUTH UTAH

PAIUTE BASKET BOTTLES.

Paiute basket bottles

(Aboriginal American Basketry, 1904, Plate 117, explanation p. 361)

COOKING WITH BASKETS:

"Baskets also made fine cooking pots. Very hot rocks were taken from a fire and tossed around inside baskets with a looped tree branch until food in the basket was cooked." (Boule, 1992, p. 8)

"Closely woven, watertight containers were also used to cook foods. Red-hot rocks were placed in a water-filled basket, bringing the water to boil and cooking the contents. As the rocks cooled off, they were

removed from the water with wooden tongs and replaced with newly heated rocks." (Burke Museum, Teacher's Guide)

POTTERY VS. BASKETRY

It is possible that baskets made by nomadic hunter-gatherers were quite advanced and also that most of these tribes did not make pottery. Pottery should not be seen necessarily as an advance over basketry -- it just depended on the needs of the society.

Well-made baskets were strong, light, and could last for generations. Native American Indian nomadic hunter-gatherers whose lifestyle was similar to Upper Paleolithic people in Europe were well respected for the quality and utility of their baskets. Pottery on the other hand was heavy and fragile.

"Nomadic hunter-gatherers are limited to technology that can be carried. If you move often and lack...draft animals, you confine your possessions to babies, weapons, and a bare minimum of other absolute necessities small enough to carry. You can't be burdened with pottery...as you shift camp." wrote author Jared Diamond. (Diamond; Guns, Germs, and Steel, p. 261) This suggests that nomadic hunter-gatherers may have focused on making practical well-made baskets for many of their needs.

There is ample evidence that basketry preceded clay vessel production almost everywhere. Clay vessels just wouldn't work for nomadic Paleolithic hunter-gatherers, but baskets would be sturdy and portable.

Vince Pitelka

Appalachian Center for Crafts

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<<http://www.potters.org/subject58018.htm>>

However, many contemporary anthropologists have assumed that pottery was superior to basketry for cooking and carrying water, but at least for nomadic Native American Indians that was not the case. They often preferred baskets.

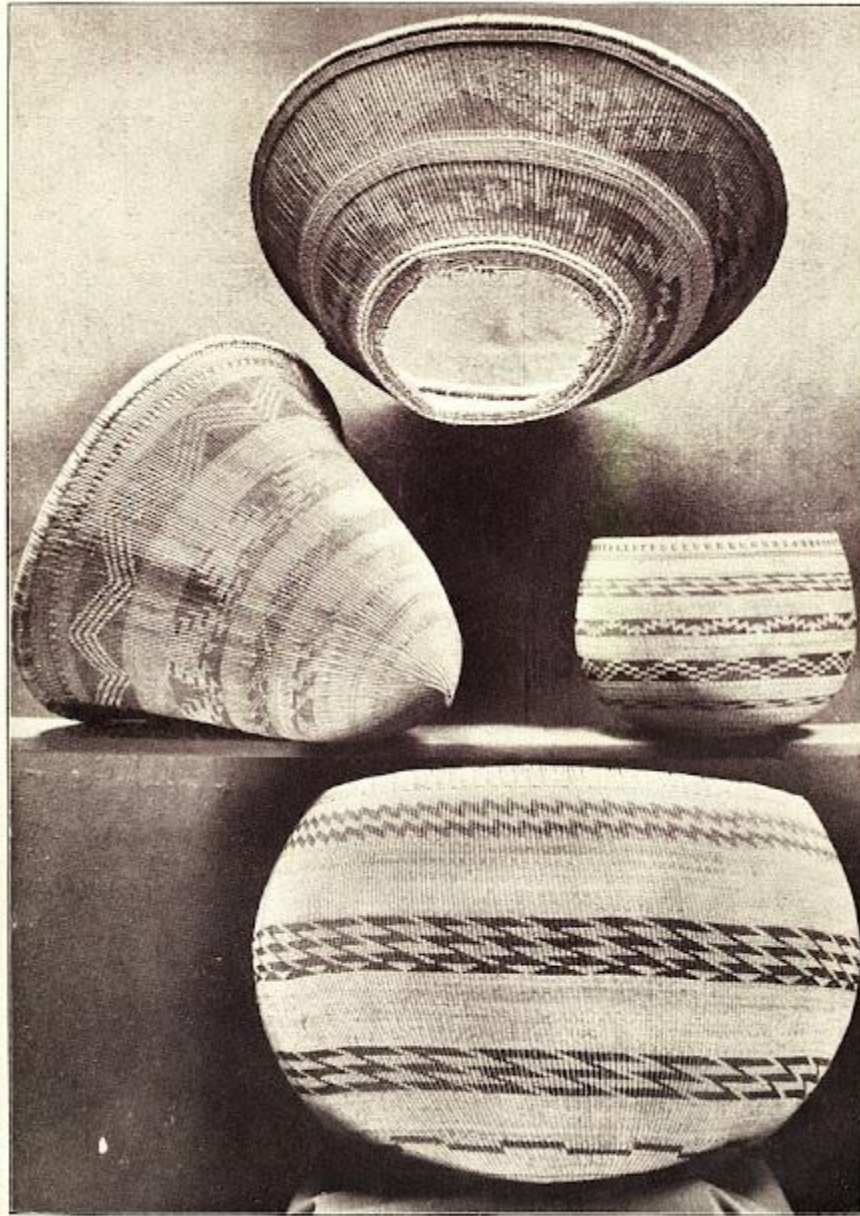
But there are other implications as well. The use of these advanced baskets along with sealing agents such as bitumen could mean that later Neolithic people inherited a well-developed woven-fiber technology and not something primitive. (I will go into detail in my next blog about the Neolithic use of basketry.)

This idea, however, is the opposite of standard thinking for most of the last century when it was assumed that basket weaving only began in the Neolithic and that in any case, Upper Paleolithic technology was rather crude.

I would also add that when pottery was invented and became part of the Neolithic sedentary lifestyle, a good deal of basketry continued to be used along with pottery -- as each had its strengths and weaknesses.

BASKETRY IN THE PRE-POTTERY NEOLITHIC ERAS

While the important invention of pottery occurred during the Neolithic, there was a long time period before that invention known as PPN A and PPN B, or Pre-Pottery Neolithic A & B (10000 - 6500 BCE). This was followed by Pottery Neolithic with the invention of pottery, which went from ca, 6500 to ca. 4000 BCE when the first cities in Mesopotamia began to take shape. In other words for more than half of the Neolithic era, there was no pottery -- yet these agricultural societies clearly needed a wide variety of containers and related items for harvesting, winnowing, milling, and sifting plus household items for storage and cooking.



POMO MILLING BASKETS.

Examples of milling baskets; Pomo milling baskets.
(Aboriginal American Basketry, 1904, Plate 97, explanation p. 350)

Those containers were most likely a wide variety of baskets. The three examples of large baskets mentioned here in this article were used to store grain, for example. Yet, I find it odd that this fact is rarely mentioned when I researched pottery and containers in the Neolithic era; the attention of researchers has been almost entirely on the invention of pottery. Clearly, baskets played a major role in the establishment of Neolithic settlements and were widely used before and after pottery took hold.

This is another example of basket technology being taken for granted or simply not considered, even though it was crucial for Neolithic development and furthermore it had become highly developed and useful in the time period before the Neolithic.

I also believe that woven-fiber technology played a major role in the first civilizations of Mesopotamia and Egypt. Both reed and papyrus boats were crucial to both, for example. Large grass houses in Mesopotamia were revered for their cathedral-like designs. And baskets were essential for dredging the marshes and hauling clay to make bricks. In Egypt there were many paintings of baskets being used in agriculture.

See much more detail about this in my earlier blog-article:

**The Importance of
Basket Weaving Technology
for the World's First Civilizations**

<<https://deconstructingtime.blogspot.com/2021/04/the-importance-of-basket-weaving.html>>

CONCLUSION

While many of the Native American Indian tribes were nomadic hunter-gatherers who made old stone age tools and seemed to live a life similar to Upper Paleolithic cultures in Europe, they also may have developed what we might call a 'hi-tech' basket technology. The sophistication of this technology is clear as the waterproofing of basket canteens shows along with the durability and wide variety of baskets.

"Many times our preconceived notions as to what ought or ought not to be present at a given site of a given age clouds and limits our ability to admit new possibilities. Ideological and theoretical biases can be quite powerful and often subtly alter our ability to see new and wonderful things." (Hyland et al, 2002, p. 8)

What does seem apparent to me is:

#1. Hominins from Homo habilis to Homo sapiens were very smart with the brainpower that each had and smart as to their use of the natural environment -- they were much smarter than previously thought.

#2. Inventing a technology from absolute zero that can utilize local materials and be put to use in the local environment of each tribe, is very difficult and takes a really long time.

#3. Hominins did not invent, develop or improve a technology or a process unless they had a compelling need. So, I believe nomadic hunter-gatherers did not need writing since they were a small group nor did they need pottery as it was too heavy and it broke, but they did need light durable baskets and they could make baskets from local materials anywhere they went. Calling them illiterate was a misunderstanding; it was comparing contemporary culture to their culture and then passing judgment on it.



"Two Havasupai Indian women in front of a native dwelling, Havasu Canyon, ca.1899."

The woman on the left is carrying a basket on her back. In the middle is a finished basket. And on the right, a woman is making a basket.

A good example of two different products: precise basket making and a crude shelter.

[https://commons.wikimedia.org/wiki/File:Two_Havasupai_Indian_women_in_front_of_a_native_dwelling,_Havasu_Canyon,_ca.1899_\(CHS-3791\).jpg](https://commons.wikimedia.org/wiki/File:Two_Havasupai_Indian_women_in_front_of_a_native_dwelling,_Havasu_Canyon,_ca.1899_(CHS-3791).jpg)

#4. Technical processes, innovation, and development do not necessarily progress in an orderly fashion. Contemporary archaeologists, for example, need to rid themselves of modern notions and realize that some past technologies may have developed haphazardly. Some tribal technologies might have been quite advanced along with simple crude technologies used at the same time by a tribe.



"Indian in canoe made of rushes, Calif., 1924."

Notice the basket in the bow of her 'tule'.

<https://commons.wikimedia.org/wiki/File:Upper_lake_Pomo_in_the_tule_swamp.jpg>

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