ARCHAEOLOGICAL DISCOVERY WITH

THE AUCILLA RIVER PREHISTORY PROJECT

Aucilla River TIMES

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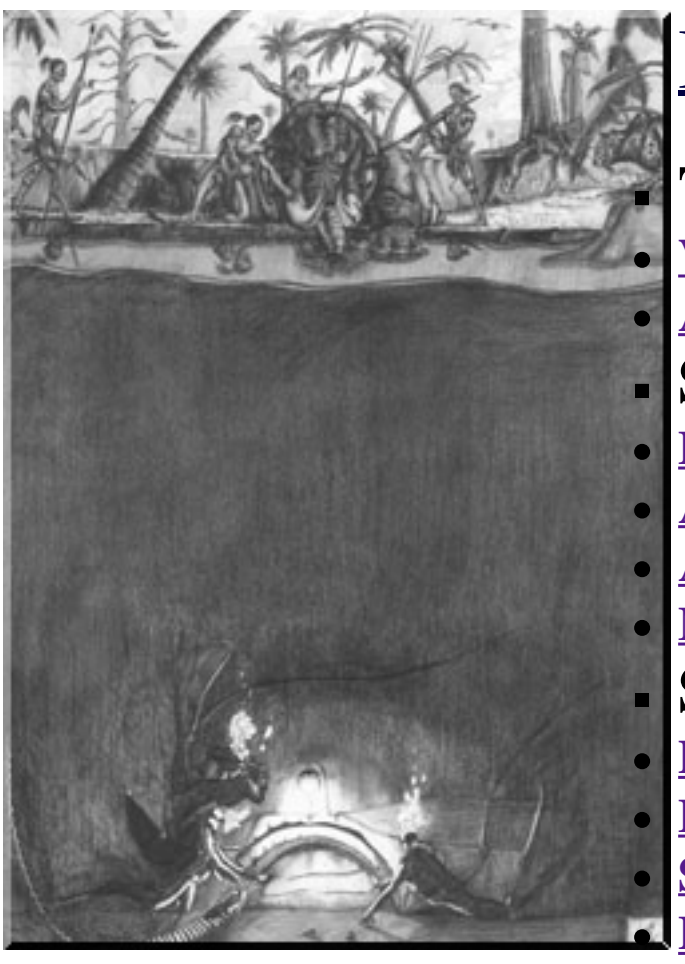
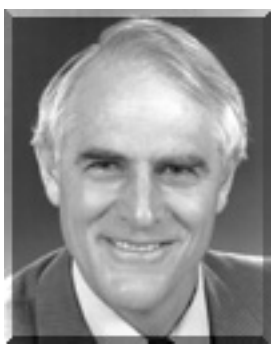


INSIDE

View from the bridge

By Dr. S. David Webb

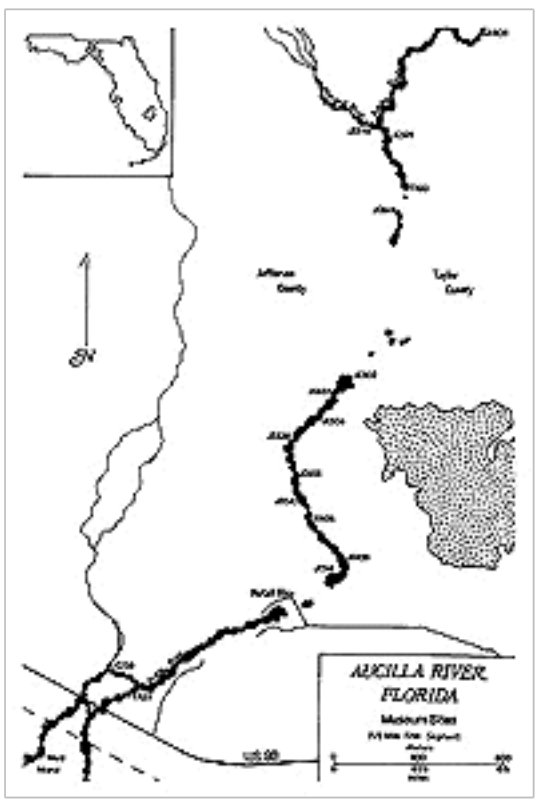


The purpose of the Aucilla River Prehistory Project (hereafter ARPP) is to increase our knowledge of prehistory in the region of the Aucilla river. We conduct sophisticated underwater excavations in sediments of three periods, including those deposited before during and after the arrival of the Paleoindians, the first people to populate the New World. Analyses of samples taken during these field activities involve several disciplines, primarily archaeology, to study evidence of human cultures, a paleontology, to analyze plants, animals, and their environments. (More about ARPP's scientific rationale is presented by Dr. Milanich.). The first of the three periods are the prehuman records, well-represented by the Latvis/Simpson Site in Little River. It provides an excellent record of fossils and sediments representing Aucilla life in the range of 30,000 years ago. The most important sites for the ARPP are those that feature the earliest human cultures. We have now identified at least five substantial Paleoindian sites, one or two in each of the three segments of the Aucilla River. Each Paleoindian site demands more carbon dates, meticulous documentation and thorough excavation. And thirdly, the ARPP has discovered several sites that represent human cultures and their environments after the terminal Pleistocene extinctions of the big mammals. we know these as late Paleoindian sites, best represented by the Bolen culture. The richest record comes from upper levels of the Page/Ladson Site and is now the focus of a doctoral dissertation by Brinnen Carter. (See Brinnen Carter's "Bolen level interpretation," in this issue). Thus the ARPP is pursuing three prehistoric periods in three segments of the Aucilla River.

Our team takes great pride in the ARPP. It has grown steadily in stature to the point where, more than a decade after the project began, the Aucilla River is recognized nationally and internationally as a major prehistoric resource. Each year the ARPP team produces substantial new evidence of human, animal and plant life spanning the past 30,000 years. The Aucilla River is now recognized and honored as a unique treasure trove of stratified prehistoric records yielding lithics, wood, other plant remains, bones, teeth, digesta, hairs and even hormones. This wonderful river has become our time machine, from which we report our adventures.

Even as the ARPP looks proudly at its glowing accomplishments, it must also try to foresee its future. There is much talk lately about the end of the millennium, which comes in December of the year 2000, and it seems useful to put ARPP planning on the same millennial calendar. Our biggest job, and our largest investment of money and manpower goes in to underwater field research. If we count down the field research that requires long lead-times, it turns out that 1997 is our last year to undertake surveying and prospecting in new parts of the river. We reserve that activity for the research of the newest of our current students. That will leave three additional years to carry out substantial field operations at sites selected from the survey data. Newly selected sites must be probed and dated efficiently, to permit rational prioritization for major excavation. Fortunately the ARPP now has a body of experience, equipment, and a well-trained cadre of underwater excavators to carry out these tasks.

Meanwhile, based on previous surveys and probings, the ARPP has earmarked major sites in three segments of the Aucilla River. For our many friends who have visited the river, Nutall Rise makes a convenient reference point. The middle segment is Little River which extends upriver from just above Nutall Rise a distance of nearly a mile to the point where the river surges out of the regional limestone (Suwannee Formation). Many who know the river regard Little River Rise as the most beautiful spot in the region. The next long segment upriver is called Half-Mile Rise; it runs a little more than half a mile and receives a tributary from the Wacissa River before disappearing underground. The third research area (indicated on the accompanying map) is West Run which connects from the Wacissa River to the main channel of the Aucilla nearly two miles below Nutall Rise along the west side of Ward Island. In each of these three segments of the Aucilla River, the ARPP has discovered and probed several sites that produce valuable, stratified evidence of prehistoric life. The one new area in which the ARPP is conducting a major survey, is the area at Nutall Rise.



Aucilla River Sites L. Carlson

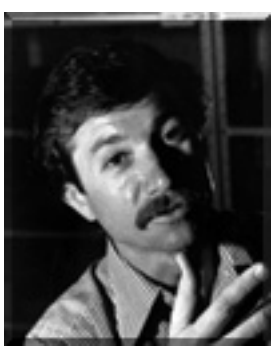
The ARPP program has succeeded only because we continue to attract and extraordinarily talented band of professional and amateur personnel.

We present profiles of some of our wonderful members in the following pages. The range of ages and talents is truly remarkable. We can never adequately thank our team of professionals, students, volunteers and supporters. It is sad to report that on December 6th we lost Wilmer Bassett, our best supporter (more about Wilmer in this issue). We are fortunate indeed that our supporters and participants seem to regard the ARPP's challenges as their own reward. Perhaps we have discovered the paradoxical theorem that drives this project: the quality of the volunteer is directly proportional to the challenge of the job.

We lead a good life at the river. We face challenging work, sometimes with exciting results. We eat well, or, at least, when you have worked up a good appetite, it seems so. Our comrades in arms are wonderful people.

These are the ultimate reasons that most of us are involved in this project. We believe that it will enrich the lives and perspectives of a wide range of human beings, including many as yet unborn. That is why we continue to she new light on these ancient treasures.

ARPP strategic research design



By Dr. Jerald T. Milanich

The ARPP, a multi-disciplinary research program launched a decade ago by the Florida Museum of Natural History, is focused on recovering and interpreting information on prehistoric human cultures and their environments. Surveys and excavations have revealed numerous late Pleistocene and early Holocene sedimentary bodies that yield archaeological and paleontological sites. Most of these are deeply inundated by the Aucilla River which has risen just during the past 5,000 years. The Aucilla sites may be divided into the following three time intervals:

- 1. Pre-human sites giving evidence of animals and environments from about 25,000 to 40,000 years ago
- 2. Paleoindian sites giving evidence of human cultures, extinct animals and their environments from as early as 12,300 to about 11,000 years ago
- 3. Late Paleoindian/Early Archaic sites giving evidence of later prehistoric human cultures, extant animals and their environments from about 11,000 to 8,000 years ago.

In recent years, funded by grants from the National Geographic Society, the Florida Department of State and the Florida Legislature, ARPP has entered a more detailed phase of recovering the rich prehistoric legacy which lies below the waters of the Aucilla River. This paper outlines a general research design for these investigations. The design conforms to the Florida Preservation Plan for Archaeology, a document prepared by Florida archaeologists in conjunction with the Florida Bureau of Historic Research (Payne and Milanich, 1989). This paper is an adaptable statement that is to be updated and altered as field and laboratory research and analyses provide new information that will lead to additional challenges and opportunities.

This broad strategy will be supplemented by tactical plans prepared each field season for each site. The latter are prepared in conjunction with detailed, written dive plans that are continually reviewed to ensure safety of field personnel and techniques as well as equipment appropriate to ambient conditions.

PALEOINDIANS IN FLORIDA

Paleoindians, the first people to live in Florida, were descended from the human populations who entered North America from eastern Asia during the late Pleistocene about 12,500 years ago.

These first groups were composed of small, highly mobile populations who rapidly increased in number as they spread throughout the Americas, leaving behind stone, bone and ivory tools that are remarkably homogeneous, at least in North America. Because of the climatic changes which occurred at the onset of the Holocene, late Pleistocene sites are usually difficult to find or are not found in contexts that can easily be studied.

Because of this relative lack of contextual information scholarly debates continue to surround the chronology and nature of the first migrations out of Asia, as well as the timing and geography of the subsequent Paleoindian colonization of North America. In addition, the nature of Paleoindian sites, especially the lack of preservation of non-lithic items of material culture, makes it difficult to describe and interpret the lifeways of the Paleoindians over the three millennia they are believed to have lived in Florida.

The sites in the Aucilla River under investigation by ARPP contain information that already has contributed new understanding to these debates. Included within these new sources of data are multiple radiocarbon dates documenting the presence of Paleoindians in Florida at least 12,300 years ago. ARPP also has shown that the Aucilla sites contain artifacts of ivory, bone and wood, as well as plant remains, items seldom found at other Paleoindian sites. The potential for leaming about the environment in which Florida Paleoindians lived and the manner in which they utilized it is enormous.

The water sources that were available must have been important to the Paleoindians as well as to many of the animals they hunted. Catchment areas provided water for drinking; they also provided locations where Paleoindians could hunt game.

If the correlation between karstic topography and water sources is secure, then we would expect that evidence of Paleoindian camps and hunting and butchering activities -- artifacts and, perhaps, the bones of animals hunted and eaten by humans -- will be found at former water holes and other perched water sources, including shallow lakes and prairies, and at deep sinks in the karstic, Tertiary limestone regions of Florida where such features existed in the past.

This correlation certainly appears to hold true. As early as the 1940s, collectors found Paleoindian artifacts and the bones of extinct animals in the Ichetucknee River within the karstic region of northern Florida. Since that time sport divers as well as archaeologists and paleontologists have collected literally hundreds of Paleoindian stone artifacts from the bottom of Florida rivers from what are thought to be inundated catchment areas. Such locales include the Santa Fe-Ichetucknee River basin, the Aucilla River-Wacissa River basin, the Steinhatchee River, the Oklawaha River- Silver River system, the Withlacoochee River (in west central Florida), the Hillsborough River, the Chipola River, and, to a lesser extent, the St. Johns River. In these rivers the artifacts are in close association with the bones of animals, presumably animals hunted, butchered, and eaten by the Paleoindians.

More support for what has been called the Oasis Theory of Paleoindian settlement came in the early 1990's when James Dunbar and Ben Waller mapped the distribution of Paleoindian Clovis and Suwannee stone points found in Florida. They found that 92% of the known sample is from the region of Tertiary limestone topography from Tampa Bay northward (Dunbar 1991).

What once were late Pleistocene water holes today are the bottoms of the rivers such as the Aucilla. Consequently, Paleoindian camps and hunting and butchering locales are inundated in our modem rivers. And although divers and archaeologists have found and documented the presence of Paleoindian artifacts in the river bottoms, those artifacts , for the most part, are materials that have been eroded out of their original contexts. This raised the questions: Are there inundated in situ Paleoindian cultural deposits in the rivers? Can they be excavated ?

The answer to both questions is "Yes," based on investigations in the Aucilla River at the Page/Ladson site. The first 10 years of the ARPP were dedicated to demonstrating that in situ deposits exist and, in some instances, are stratified.

ARPP surveys also have shown that the density of inundated Paleoindian sites is very large, probably reflecting the reliance of Paleoindians on the late Pleistocene water holes that today occur within the river banks. In the Half-Mile Rise section of the Aucilla River and two other locales in the same river ARPP has recorded 26 Paleoindian sites, more inundated Paleoindian sites than were recognized in all of Florida previously.

Further topics dealt with in detail under Paleoindian section of this research design are the following: Climates and Sea-levels; Sites and Settlement Patterns (Testing the Oases Hypothesis); Sampling and Carbon-Dating; Subsistence on Large Animals, Small Animals and Plants; and the Tool Kit, including Lithics, Bone and Ivory, and Wood.

Fluted points in North America

By Dr. Michael K. Faught

Fluted Paleoindian points are found all over North America, but -- as Ronald Mason first noted in 1962 -- their distribution is not uniform. This data has a number of important implications for the study of early human occupation in North America, and it points out that Florida's robust Paleoindian record is important from a continental perspective. Since the 1950s, many publications and manuscripts have been written which tally the numbers of points known for individual counties and whole states. Regional compilations of this data for several Eastern States was begun in 1982 and done recently by David Anderson. These two publications demonstrated that fluted points are plentiful in the Eastern United States. However, it seemed to me that there were far fewer fluted points in the West, but no puclished compilation existed to compare the whole continent systematically. Therefore, I accumulated additional data from the Central and Western states in 1993, as part of my own dissertation research.

Figure 1 represents the distribution of all these points. The map was prepared by using the data compiled by Anderson (over 9,000 points) and Faught (over 1000 points) for a total sample of 10,198 points. The centroids of each of the 3,075 counties in the coterminous United States represent the locations of the data points and the values were standardized to points per 1,000 square miles, by

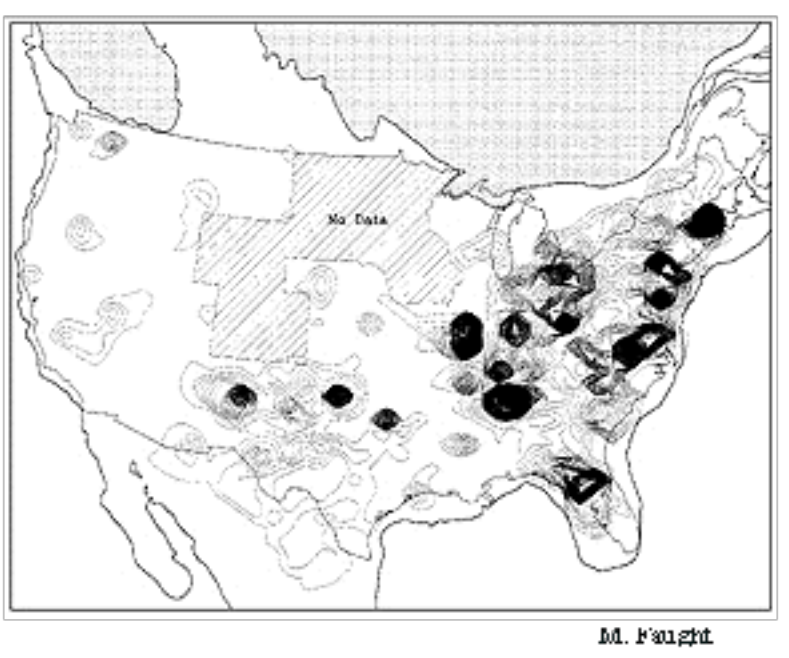


Fig. 1 *Fluted Point Distribution in North America*

dividing the area of the county by the number of fluted points recorded. Areas outside of the modem coastline and within the glacial boundaries of 11,000 years ago were zeroed out. This data was then contoured with SURFER software and the image was manipulated in AutoCAD for printing. It was fun once the preliminary data had been put together.

The sample shown here is largely restricted to fluted points, including Clovis, Folsom, Debert, Gainey, and other variants in the West. Daltons and Quads, which are sometimes fluted (or basally thinned), were not included in the contouring routine, though they would have made the Northern Alabama cluster quite robust. On the other hand, Suwannee and Simpson points were included in the sample from Florida.

When looking at the map it is immediately evident that there is a higher frequency of fluted points to the East implying that more Paleoindians settled east of the Mississippi over time. Another curiosity is that fluted points are unevenly distributed across the landscape, with pronounced accumulations in some areas rather that others. Some of us think that this means that human populations were also unevenly distributed and that communities of Paleoindians expanded out over the landscape by skipping over less desirable locations and ending up in more desirable spots, probably places with water, chert, and animals or other specific resources. This pattern is associated with the major rivers of the region, particularly around the confluence of the Mississippi and Tennessee Rivers, and it counters the notion that these people spread out gradually and evenly over the landscape as population growth increased. This pattern more closely resembles a leapfrog, rather than wave-of-advance pattern.

These concentrations also offer insight into the emergence of subsequent Early Archaic cultural traditions in the East, say between 10,000 and 8,000 radiocarbon years ago. Settlement and continuity of people who made fluted points is not so apparent in the West. Tracing these developments is becoming an exciting and current concern in North American archaeology, and such research focuses important attention on the Southeast for the answers to questions about fluted point origins.

Several concentrations of fluted points are located near modern coastlines and thus near the continental shelves, indicating places where inundated Paleoindian and Early Archaic sites might exist offshore. The field research part of my dissertation focused on finding and excavating sites in the PaleoAucilla channel, located offshore in the Apalachee Bay, just beyond the mouth of the Aucilla.

I also studied a robust sample of North American Paleoindian and Early Archaic sites for the dissertation, not unlike the isolated fluted point study shown here, and found that the earliest examples of Classic Clovis sites, which are the earliest fluted point sites known, are clustered in the Southern Plains (Texas, Oklahoma and New Mexico), where isolated fluted projectile point finds are somewhat less dense than in the East. These sites date unequivocally from about 11,550 to 10,900 radiocarbon years ago. The Northeastern-most cluster near Maine wasn't occupied until about 10,600 radiocarbon years ago.

Recent summaries of Paleoindian archaeology have observed the lack of unequivocal radiocarbon control for early Paleoindians from the Central and Southeastern regions of the United States. We need better radiocarbon control from the Mississippi/Tennessee/Ohio river confluences and the Florida Karst. The Page/Ladson site lies in this Karst region. Since the Page/Ladson site has one of the most complete records of late Pleistocene/Early Holocene sediments in the Southeast and an almost continuous Holocene stratigraphic record after that, it is probably the site with the most potential for the discovery of in situ evidence of Paleoindians of any projects I know of in the Southeast. It could be that Page/Ladson, or some other Paleoindian site in the Aucilla, will be the place where the unequivocal chronology for the Southeastern region will begin to accumulate. Certainly, there are several provocative things at Page/Ladson which suggest early human presence.

David Anderson and I have agreed to continue assembling and compiling more data on Paleoindian artifacts and assemblages, and welcome information of this kind from state perspectives. Since there is not room to list all of the references for the map shown here, I suggest reading Faught et. al. (1994).

Again, the fluted point map is a work in progress. Certainly, we wish to thank all of those people who have contributed so far to the construction of this database, and encourage others to join in.

Adapted from North American Paleoindian Databases by M.K. Faught, D. G. Anderson and A. Gisiger, 1994.

Atl atl replicate study

By Jim Dunbar

INTRODUCTION

This study was undertaken to test the assumption that the Florida assemblage of carved mammoth ivory artifacts were utilized as spear foreshafts. Dr. S. David Webb and I (submitted for publication) contend the Florida specimens were used as foreshafts rather than for some other function, such as osseous (bone, antler or ivory) projectile points as was the case in the European Upper Paleolithic.

Webb and I found support for the foreshaft hypothesis based on the frequency and location of green bone fractures on the Florida sample. Green bone fractures or breaks can be differentiated from breaks which happen after a few seasons of weathering when the osseous (bone, brittle antler and ivory) material relinquishes its elastic properties and becomes brittle. Of 39 measurable specimens 51% of the sample displayed green bone fractures. Green bone fractures were most common on the beveled end accounting for 76.2% of the green fractures. Fractures on the beveled platform displayed a jagged, irregular tear indicative of compression fracturing. That is where we reckon that the base of a stone spear point had been hafted to the foreshaft, causing breakage.

However, in developing the data on the ivory artifacts, Webb invited Heidi Knecht to inspect the Florida specimens. Knecht, who had done her doctoral research on European Upper Paleolithic osseous points, cautioned Webb that beveled end breaks similar to the breaks on the ivory shafts also occur when they are used as projectiles. In her dissertation, Knecht discussed Gravettian single-bevel bone points, their specifications, manufacture and use. In another study Dave Guthrie also found that breaks along single beveled bone shafts used as projectiles occurred at both the pointed and beveled ends. Because of the caution expressed by Dr. Knecht and the contradictory findings of Guthrie, an experiment using ivory and other materials for foreshaft material was deemed necessary. Some preliminary results are presented here. The idea was to propel spears with attached foreshafts using a spearthrower.

MANUFACTURE

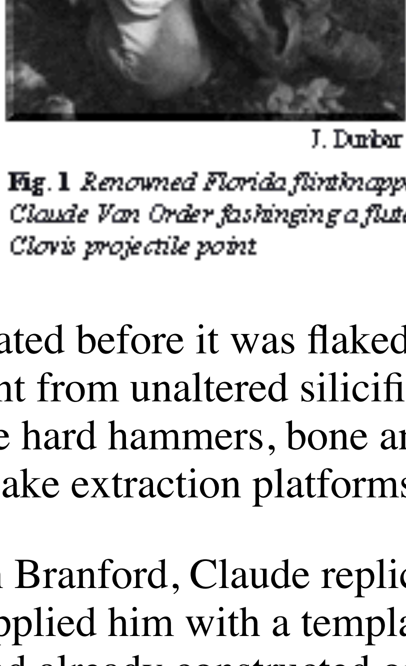
A. SPEARTHROWER (ATL ATL)

Two spearthrowers or atl atls were used to propel the foreshaft-tipped spear, one with two finger notches and the other with a straight hand grip. The finger notched or forward-grip atl atl is based on a modified Key Marco design. The straight handled or side-grip atl atl is based on a replica of a European Upper Paleolithic design. The forward-grip atl atl was constructed of pine wood and weighed 224 grams. It had a central groove running down its length for a shaft rest. The groove also allowed the proximal spear socket to be run up to the distal end of the atl atl where the spear socketed into a small upturned antler spur. This design proved to be easier to load and maintained the spear in throwing position. The side-grip atl atl was constructed of a composite of cypress wood and deer antler. The distal 1/5th is constructed from a piece of curved antler having a small hook at the end. The wood and antler sections were fastened by dowel-pin and socket joint and cemented with hide glue. This joint was bound with false sinew and hide glue to provide strength. This atl atl weighed 142 grams. Its design requires the user to visually observe the loading of the spear socket into the atl atl spur. It also requires the user to hold the spear in place in a somewhat awkward position, tightly pinched between the thumb and forefinger, before each throw. If the user is not attentive, the spear socket will dislodge from the atl atl spur requiring the user to reload before making a throw. This spear thrower has no shaft rest to minimize spear dislodging. In this experiment the forward-grip atl atl spanned a length of 38 cm from its distal hand grip to its spur, while the side-grip atl atl extended 45.7 cm between corresponding points.

B. SPEARS

A functional antler socket was made from a section of elk antler tine. This socket is 7.51 cm long with a conical socket 5.58 cm deep. It is also drilled on the opposite end with a straightsided hole 1.93 cm deep. It was seated onto the wooden spear shaft with dowel pin and socket joint and required no glue or hafting due to its tight fit. The conical hole was bored into the antler with a steel reamer which has the same angle of taper as the mean of the data from our ivory foreshaft study. Several wooden spear shafts were handmade but only the best one was used with a foreshaft attached. Many thanks are extended to Captain Way Grisset of the Tallahassee Fire Department who also owns and operates a part-time saw mill. He not only furnished the wooden shaft material, but also produced the first shafts and lessons on how to hand whittle square stock into round dowels using a block-plane. Shafts of oak, cypress and pine were made, but the oak shaft was fixed with the antler socket and used to carry the spear foreshafts to their targets. This shaft is 1.778 m long by 1.5 cm in diameter. The fletching starts about 5.5 cm below the proximal end of the spear shaft so that the feathers do not get damaged by the atl atl. Ken Home of the Museum of Florida History fletched the shaft in a Cherokee style with turkey feathers. The completed spear shaft used for testing foreshafts weighs 227 grams (with fletching, sinew binding and antler socket without foreshaft).

C. STONE PROJECTILE AND SPEAR FORESHAFT



J. Dunbar

Fig. 1 *Renowned Florida flintknapper Claude Van Order fashinging a fluted Clovis projectile point*

Many thanks to Claude Van Order who graciously demonstrated his considerable stone flaking (flint knapping) and bone carving skills. We met Claude at the Ginnie Springs youth camp jamboree where he was demonstrating flint knapping, and Jimmy Sawgrass spoke of the legends and lifeways of the 19th century Seminole indians. Wayne Grissett, Joe Latvis, Rob Patton, Jerry Gramig, Chris Lewis, Dean Quigley and Mark Muniz were among the group in attendance.

Silicified coral was prized by Archaic indians who routinely fashioned spear points from it about 5,000 years ago. In Archaic times it was heat-treated before it was flaked into final shape. Claude, however, made a fluted Clovis point from unaltered silicified (agatized) coral (see fig. 1). His tools consisted of stone hard hammers, bone and antler soft hammers, and an abrader rock to grind the flake extraction platforms.

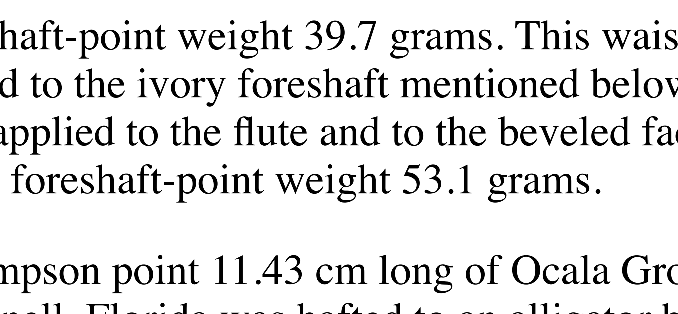
Late that evening, at the Steamboat Hotel in downtown Branford, Claude replicated the manufacture of an ivory foreshaft. I had already supplied him with a template of average dimensions for constructing a foreshaft. I had already constructed one of oak wood using modern tools (a bench sander and various saws). It was Claude's task to make one the old fashioned way.

Dr. Webb furnished a piece of ivory cut from the proximal end of an African elephant tusk which was 17 cm in length. The 17 cm length is actually short for foreshaft production but slats of that approximate length had been sent to Claude who had pretreated them by soaking in water for about three days.

While Joe Latvis videotaped the sequence, Claude manufactured a replica foreshaft from a slat in about 20 minutes. He used a 454 gram uniface chopper to hack the foreshaft into rough shape. At first he had problems trying to chop the ivory on the soft, cushioned surface of a rug. This problem was solved by using a large block of pressure-treated wood as an anvil. Long shavings curled off the ivory during the chopping process and were reminiscent of block plane shavings.

Once the general shape had been formed, he combined scraping, using the edges of the chopper and a blade struck from a blade core. A very porous chert abrader was used in rasp-like fashion to smooth out the chop-marks on the shaft.

The beveled end was finished by cutting gashes (basal roughening) into the face of the beveled platform and around the diameter of the shaft in the platform area. These gashes were made on the beveled end by using one edge of the elongate uniface chopper in knife-like fashion. The pointed end of the foreshaft was polished by using an obtuse flake ridge on the chopper for heavy rubbing followed by sand grit on leather, with the foreshaft stropped over the gritcovered surface.



J. Dunbar

Fig. 2 *Replicated projective point/foreshaft combinations.* **Top**: *Clovis point on ivory foreshaft bound by beargrass.* **Middle**: *Waisted Clovis point on wood foreshaft bound by dental floss.* **Bottom**: *Simpson point on alligator bone foreshaft bound by sinew.*

ASSEMBLAGE

Four foreshafts with lithic projectiles were constructed (see fig. 2). A Clovis (or Cloviswaisted) fluted point 6.98 cm long of Suwannee Limestone formation "cannonball" chert was hafted to an oak wood foreshaft with unwaxed dental floss and Elmers white glue. Total foreshaft-point weight 39.7 grams. This waisted Clovis fluted point (#l) was re-hafted to the ivory foreshaft mentioned below. A mastic of pine rosin and tallow was applied to the flute and to the beveled face of the foreshaft during hafting. Total foreshaft-point weight 53.1 grams.

A Simpson point 11.43 cm long of Ocala Group Gulf Coastal Plains chert from Bushnell, Florida was hafted to an alligator bone foreshaft 20.96 cm long using hafting mastic made from pine sap and animal tallow, and bound together by deer sinew. This was the heaviest of the foreshaft-point combinations at 90.3 grams. It withstood three or four throws before impacting the target at an awkward angle caused it to glance off and snap the lithic point at the intersection of the sinew binding. The sinew binding of the haft remained very secure around the basal fragment of the point that snapped. The sinew binding was later removed by letting the foreshaft soak in wan-n water for about an hour.

A parallel-sided "classic" Clovis fluted point 9.52 cm long of Suwannee Limestone formation Flint River chert was hafted to an ivory foreshaft 15.54 cm long using hafting mastic made from pine rosin and animal tallow, and bound by strands of bear-grass fibers. This foreshaft-point (#2) weighed 50.5 grams.

Summary of Results

I Target: Styrofoam (50-Gal. Drum)
- A. Ivory with Clovis (#2)
  3 hits at 12 meters
  penetration (maximum 11.4 cm)

II Target: Dead Palm Trunk
- A. Ivory with Clovis (#2)
  1 hit at 12 meters
  haft tore off
- B. Wood with Clovis (#1)
  1 hit at 9 meters
  24 hits at 12 meters
  6 hits at 18 meters
  2 hits at 25 meters
- C. Ivory with Clovis (#1)
  8 hits at 9 meters
  8 hits at 12 meters

RESULTS

This initial experiment of tossing replica foreshafts tipped with Southeastern Paleoindian projectile points produced 53 throws which hit and stuck into the targets as summarized in the graphic "Summary of Results"

DISCUSSION

The purpose of this experiment was to duplicate the type of damage found on the assemblage of ivory artifacts from Florida proposed to be Paleoindian spear foreshafts. Even though there is no evidence that Paleoindians used the atl atl, it was used in this experiment because of the greater likelihood of producing impact damage over hand-thrown spears.

The foreshafts not only withstood 53 direct hits into rugged targets but also survived many more plunges into the dirt and, occasionally, into a hardwood tree. This suggests the foreshaft concept represents a functional design that works with little fear of damage. With most hits the point not only stabbed the palm tree, it also supported the weight of the spear shaft above the ground by its projectile point. On about a dozen occasions the lithic point had to be freed from the palm wood with a wood chisel and hammer.

Surprisingly, no damage was inflicted on the foreshaft replicas. Rather, the base of a Simpson point broke in its haft at the torque point where Webb and I had predicted the foreshaft would fail.

A problem of lesser importance was maintenance of the haft. The plant fiber haft quickly failed. The plant fiber hafting held up when the foreshaft penetrated beyond the haft, but the first time that the haft was left exposed, the weight of the spear shaft severed the plant fibers. The unwaxed dental floss stretched and wore and needed to be replaced or reinforced several times. The combination of animal sinew and mastic seemed to provide the most durable hafting.

The wood foreshaft tended to jam into the antler socket, especially on humid days. The ivory foreshaft jammed infrequently. On two occasions however it required pliers to dislodge the ivory shaft from the socket. Perhaps not coincidentally, these occurred on a humid day.

More testing will be conducted. We suspect that serious breakage occurred rarely, perhaps when spears hit bone.

African elephants: a modern analog

By Matthew Mihlbachler

Because Paleoindians most certainly exploited Proboscideans, they must have shared an intricate ecological relationship that was important in shaping both the lives of the people and the elephants. How and why they hunted these herbivorous gargantuans is perhaps the most elusive aspect of their lives. In order to shed some light on this conundrum, the ecology of the modern African elephant is a useful analogy for the ecological role that mastodons and mammoths played at the end of the Pleistocene in Florida. Due to the biological necessities of immense body size, all Proboscideans have a unique ecological role defined by their need for great quantities of food, water and habitat and by their great muscular strength.

These combined attributes give them an unparalleled ability to completely terraform any area that they occupy. Proboscideans do not simply live in places that are suitable to them. They alter the land to suit their needs.

East Africa, for example, is known for many wildlife parks where large elephant herds can be seen. The landscape of these parks ranges from savanna to forest scrub. The forest never grows dense and the land remains open. Animals are easily seen in this environment by tourists. We can imagine the same for prehistoric elephant hunters. The elephants themselves are largely responsible for building this unique sort of environment. We can expect that the Pleistocene Proboscideans of Florida also created and maintained a unique habitat that no longer exists on this continent.

M. Mihlbachler

Fig. 1 *East African elephants moving through a barren landscape they helped defoliate.*

The distribution of water sources is especially important in defining where elephants can roam. Modern open country elephants of East Africa are left without water sources for the dry season. To avoid dehydration they literally create watering holes in areas where there are none by digging holes until they tap into ground water. They maintain these

holes and the supply of vital water allows elephants to remain in the area and consume the local vegetation.

In their never-ending quest for great quantities of herbage, they push over many trees, strip bark from trees and, in the process, kill them. Smaller plants are torn right out of the ground and eaten whole. Elephants also graze on grass, usually ripping the entire plant, roots and all, right out of the ground.

The late Pleistocene of Florida was certainly much drier than today. This scenario, along with the presence of Probicideans tells us that here a similar phenomenon took place. Elephants utilized the available water such as the sinkholes in the Aucilla river. Heavy trampling around the water holes kept almost all vegetation out of the area. As a result, other animals probably were granted greater access to these areas to drink, rest and wallow. These sinkholes became centers of congregation for many species where Paleoindians could easily locate and exploit game.

For miles around, the elephants processed countless tons of vegetation. Mastodons probably pushed over trees, such as palms, to eat leaves and fruits. They also could have browsed on shorter plants, pulling them right out of the ground. Mammoths fed on all forms of graze, maintaining the open country of Pleistocene Florida.

Together these two Proboscidean species shaped the paleoenvironment of Florida long before humans discovered it. The earliest pioneers probably found open plains and areas that were sparsely populated with trees. Great numbers of the trees were stripped of their bark and smaller trees were pushed over.

Modern elephants are capable of pushing over trees of over a foot in diameter. Mammoths and mastodons of Florida were larger and could push over trees with even thicker trunks. A dense forest simply could not survive under the weight of their influence and only clumpy groups of trees and scrub could survive. The grasslands were tattered also. Elephants do not clip vegetation evenly as cattle do. They pull it out with their trunks or kick it up with their front feet. Hence, open lands consisted of small grass patches and bare, uprooted soil.

Elephants dig for minerals and create mud wallows that can eventually become large permanent holes. The geographical shape of the land would have been altered by this. Soils would be greatly exposed and erosion must have become more accelerated than at present.

This description evokes a more open landscape than the lust subtropical forest that surrounds the Aucilla River today. In this view elephants may be no better than humans in creating wastelands and devastating habitats. After an area is cleaned out, the elephants move on to lay waste to another area.

Today in East Africa overpopulation is a serious threat to elephant herds. Being restricted to national parks, they are capable of destroying all of their available habitat at a faster rate than it can recover. Modern elephant observations tell us that extinct Proboscideans could have destroyed their own resources beyond recovery.

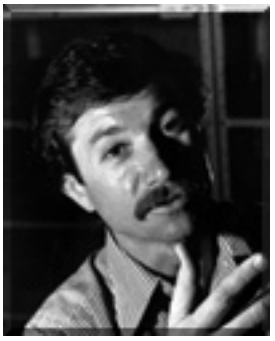
Despite the destruction, elephants are capable of maintaining an ecological system where their immense size helps shape the physical surroundings. They also provide open habitats that are desirable for large numbers of other animals. Prehistoric Florida was filled with many different huge animals that were all quite successful. Giant sloths, bison, glyptodonts, horses, camels, tapir, peccary, deer, giant beaver, capybara and a host of other mammals seemed to inhabit the altered Proboscidean landscape, and presumably benefited from it.

When people entered these areas, they probably had to alter their survival strategies. They were no longer dealing with arctic tundra or pine forest. Nor were they hunting the tundra dwelling Woolly mammoth. Now they were dealing with the Colombian mammoth and the American mastodon.

In this new environment, more like an African savanna, with two species of Proboscideans never before encountered, it is likely that a new hunting strategy had to be created and a new way of life formed. The environment was open and filled with visible game. It is remarkable that early Floridians continued hunting elephants at all given that there were slow moving sloths and smaller animals such as deer to prey on. Because Proboscideans continued to be utilized by these people it shows how important elephants really had become to the first New World inhabitants.

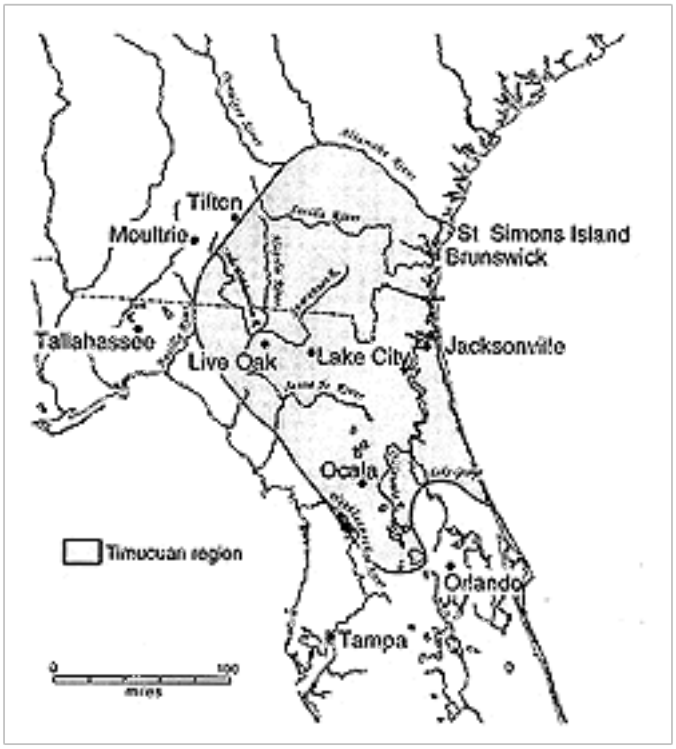
Missions, Timucuans and the Aucilla

By Dr. Jerald T. Milanich



In the early sixteenth century native people who spoke the Timucua language occupied most of the northern one-third of peninsular Florida (east of the Aucilla River), apparently not including the Gulf of Mexico coast. The Timucua also inhabited southeastern Georgia as far north as the Altamaha River. In 1492 this large area, about 19,200 square miles, was home to approximately 200,000 people.

The Timucua were never a single political unit. Instead the people we refer to as the Timucua were made up of 25-30 (or more) individual chiefdoms, each consisting of at least 510 villages. The chief of a chiefdom's main town served as overall leader. Sometimes chiefdoms formed alliances with one another for offensive or defensive military purposes or for other reasons.



J. Milanich

Fig.1 *Region of the Timucua Indians in 1492.*

In 1528 and again in 1539 Spanish expeditions marched through northern Florida, crossing the Aucilla River as they passed from Timucuan territory to the province of the Apalachee Indians. These military incursions were among the Timucua for only a matter of weeks. Shortly after the founding of the Spanish colonial settlement at St. Augustine in 1565 the Timucua entered a new phase in their interaction with people from Europe. In 1573 Pedro Menendez de Aviles, founder and governor of the La Florida colony whose capital town was St. Augustine, arranged for Franciscan missionary friars to administer to the Timucua. Missions were intended to save the souls of the Indians even while transforming the native people into loyal Catholic subjects of the Spanish crown who could be forced to labor in support of the colony. After several unsuccessful attempts, missionary efforts began in earnest in 1595.

By that year the Timucuan population had shrunk to about 50,000, a 75 percent drop fueled by epidemic diseases introduced from Europe. The number of chiefdoms also had shrunk; only thirteen still existed: the Mocama-Guadalquini chiefdom on the Georgia

and northeast Florida coasts, where three early missions were established (this chiefdom was apparently an amalgamation of earlier ones); Enecape just north of Lake George, site of the mission of San Antonio de Enecape; Acuera in the Oklawaha drainage with one mission; Ocale east of the Withlacoochee River (and west of Acuera) in Sumter and Marion counties, where one mission was built; Potano in Alachua County, where four early missions were built (two of which were gone by 1620); Utina in Columbia and Suwannee counties where four missions were founded; Yustaga in Madison and Hamilton counties in Florida and southern Georgia (east of the Aucilla River) among whom eight missions were built prior to 1623; Arapaha along the upper reaches of the modern Alapaha River in Georgia with one mission; Utinahica near the intersection of the Ocmulgee and Oconee rivers with one mission; Oconi in the Okefenokee Swamp with one mission; Ibihica to the east, served by mission San Lorenzo; and the Cascangue/Icafui and the Yufera chiefdoms farther east in southeast Georgia, both of whom disappeared very early in the seventeenth century.

Missionary friars moved systematically among each of these chiefdoms, founding a mission in each main town and in some outlying major villages. Within Yustaga the mission of San Miguel de Asile, would give its name to the Aucilla River.

If the 75-percent population decimation of the sixteenth century prior to the missions seems large, the figure for the seventeenth century is positively horrendous. From 1595 to 1700, the period of the missions, the Timucuan population suffered a 98 percent reduction, from 50,000 people to 1,000. And when Spain relinquished Florida and St. Augustine to the British in 1763, only a single Timucua Indian is listed on the roster of native people shipped to the town of Guanabacoa in Cuba.

Against the seventeenth-century backdrop of population erosion, the missions sought to incorporate the Timucua into the Spanish colonial realm. Indeed, the missions were colonialism. It was the missions that harnessed the Timucuan villagers to Spanish servitude. A system of labor quotas was organized through mission villages, providing native backs to serve St. Augustine.

Because Florida was a poor colony, its very existence depended on native labor. When mission village populations fell because of seventeenth-century epidemics, the colony's survival was threatened. To assure bodies for labor, Spanish officials moved populations and amalgamated villages. At times the remnants of once large chiefdoms were joined.

Some native laborers worked on Spanish haciendas located in the interior of northern Florida. One hacienda, a farm, was near the Aucilla River near mission San Miguel. Begun about 1645 by then governor of Spanish Florida Benito Ruiz de Salazar Vallecilla, the ranch grew wheat and corn; pigs were raised for export.

The Aucilla farm had extensive fields cultivated with the help of horses, mules, and

oxen. Several documents, including an inventory taken after Rufz de Salazar's death, indicate the farm buildings included a large wooden house, a separate wooden kitchen with oven and two footmills, a thatched building for storing flour, a house with clay-daub walls, and several granaries. An African slave from Angola named Ambrosio and the mulatto overseer, Francisco Galindo, helped to run the ranch and were included in the inventory.

Also listed in the inventory were 22 oxen, 8 horses, and 45 head of swine. Tools, farm implements, and furnishings included a whetstone, auger and bits, spades or hoes, hatchets, sickles, hand adzes, saws, carpenter's planes, machetes, iron goads, iron chains, table and benches, an oil lamp, beds, one pewter dish, and two bricks of chocolate, the latter used to cure dysentery.

Although native depopulation would eventually have doomed the missions and the colony to failure, that end was hastened by the establishment of British colonies on the eastern seaboard. Beginning in the 1660s and increasing in the 1680s, raids on the Timucua and Guale Indian missions by Carolinian-inspired native slavers,sometimes actively abetted by Carolinian militia, pressured the missions. Some mission dwellers fled, more were captured, and villages were abandoned.

The end of most of the Timucua missions came in 1702-1705 when several large Carolinian raids destroyed them (as well as those of Apalachee province). Survivors moved to new towns close to St. Augustine, where the remaining Timucua continued to be administered by Franciscan friars.

But in those refugee towns the Timucuan quickly failed. A 1717 census lists three villages housing a total of only 250 Timucua Indians. By 1726 that number had dropped to 157 Timucua, and two years later it was 70. In 1752, 29 Timucua remained, all living in a single town. A decade later when Spain withdrew from Florida there was only one Timucuan Indian still alive to accompany the Spaniards to Cuba.

Page/Ladson site Bolen level hearth

By Mark Muniz

They had arrived in the early evening after a long day's walk. There had been no luck hunting, the big creatures no longer lived here and the smaller antlered ones had not been seen all day. No matter, tomorrow was another day and they would try again, but for now, their thoughts turned to warmth as the cool night began its descent. A number of rocks were gathered into a circle and a fire was lit within. Over the next few days or weeks many a story would be told around this fire, meals cooked in it, bodies warmed by it, until the group picked up and moved on to its next destination. In their trail they left behind only a few tools, scraps from meals, and a ring of simple rocks. Perhaps next year they would use the same camp again.

As the millennia passed, water levels rose, and sediment covered the camp, burying the activity surface, sealing a hearth and the associated rocks and tools left there with it. Eventually archaeologists arrived and uncovered the surface relatively intact, probing its mysteries in the attempt to reconstruct the lifeways of a people 10,000 years behind us. However, there is much more to reconstructing the scene than may first appear. As humans are a part of nature, there are natural forces influencing the archaeological record as well. In the case of the Bolen surface at the Page/Ladson site, 8Je591, nature has added both alluvial disturbance as well as erosional factors to be considered when interpreting the 10,000 year old occupation. To the archaeologist, these natural site formation processes can be considered equivalent to the background static provided by cosmic radiation that astronomers must sort through. Just as the background static can tell astronomers something about the formation of the universe, it can also mask unique signatures given off by the stars and galaxies the astronomers wish to study. The archaeologist also must be able to distinguish between the true cultural signature left by humans and the natural "static" provided by geologic events. This natural static, however, provides a great deal of information about the environment of the archaeological culture being studied. In the scenario provided above, dealing with a feature (the hearth) comprised of a relatively unaltered natural material (simple rocks) and exposed to 10,000 years of hydrologic and geologic processes, one can understand how the interpretation of the human activity that was associated with the hearth can become difficult. But do not be discouraged, for there are ways to decipher this ancient puzzle.

A total of 207 rocks were collected from units 0, P, Q, T, U, and V. Together these units added an additional six square meters to the overall exposure of the Bolen surface (see fig. 1). While the hearth itself was quite evident (its irregular shape was approximately 28cm x 41cm and 10cm deep with charred wood embedded in its center), the particular stones that were originally associated with it were not as clear. While it was certain that there were some, fire cracked rocks among the 207 collected, a thorough analysis was begun to quantify characteristics that would distinguish the fire cracked rocks from those rocks that arrived on the site due to natural processes of erosion or fluvial transport. Unfortunately, there have not been very many analyses done similar to this one so that some base of comparison could be derived. Too often an archaeologist will consider a scatter of rocks to be a natural occurrence, dismissing attempts to quantify characteristics present in the assemblage as pointless. With limited time and resources, one can understand how more attention is placed on artifact analysis. If a paleoenvironmental reconstruction is attempted, however, analyzing something as simple as a rock can lead to other useful information as well. The archaeologist may also discover patterns of human behavior in a resource not previously considered.

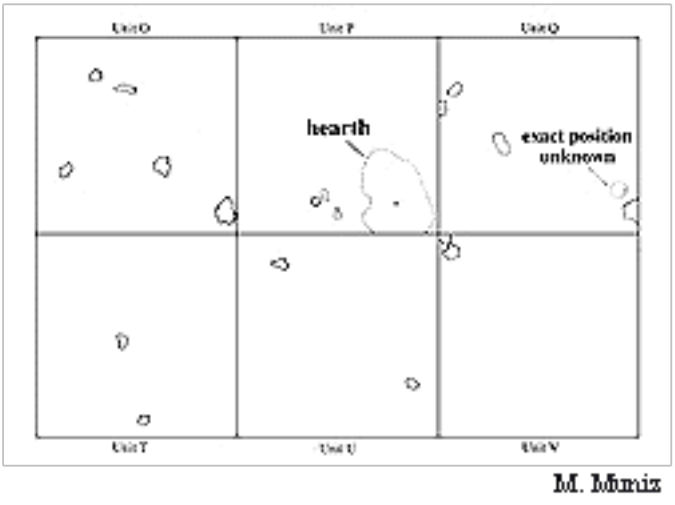


Fig. 1 *Page/Ladson site Bolen level hearth.*

Using a definition for fire-cracked rock provided by Steven K. Lovick in Fire-Cracked Rock as Tools: Wear-Pattern Analysis (1983) characteristics for each specimen were determined as follows: rock type (i.e. parent material); color; angularity; spericity; presence of use-wear; presence of thermal alteration (evidence of fire cracking, blackening); weight; and length of longest axis. Twenty five of the 207 rocks surrounding the hearth were determined to be fire cracked, and another 18 were considered to be possibly fire cracked but equivocally so. Of the 25 fire-cracked rocks (FCR): 80% are dolomite, with the remainder limestone; 24 of 25 are gray in color (occasionally with darker and lighter bands and mottles) with one being mottled light tan-tan-dark tan; 100% exhibit angularity and low sphericity; 3 of the 25 may show signs of use wear (although this is difficult at best to determine on such an unmodified, informal artifact); all, of course, showed signs of thermal alteration; weights ranged from 12.9g. to 560g. with an average of 158.8g.; and lengths ranged from 5.lcm. to 17.4cm. with an average of 10.lcm.

As this issue of the Aucilla River Times goes to press, analysis is still in progress. A graph contrasting fire-cracked rock weight and distance from the center of the hearth is

being compared with a graph of non-fire-cracked rock weight and distance from the center of the hearth, in an attempt to discover if there is a significant difference in the two assemblages. The results from this study will also help us understand how alluvial influences affected the site formation process at Page/Ladson, and thus may be of use in the future interpretation of site assemblages in other parts of the Aucilla River. We have also planned to examine both FCR and non-FCR using X-Ray diffraction in order to assess mineralogical change that may be present in the FCR due to exposure to high temperatures while still a part of the fire ring. We have also planned to treat the surfaces of the FCR and non-FCR with hydrochloric acid to release charred carbon residue that may also be present from exposure to fire. These final measures are being employed to better quantify fire-cracked rock on the Bolen surface in an effort to reconstruct the occupation there as accurately as possible. Stay tuned as we will hopefully have this picture completed before we return to the field in May, until then ...

Bolen level interpretation

By Brinnen Carter

Mark Muniz's accompanying article has focused on connecting the artifacts we have located in the bottom of the Aucilla with specific behaviors of individual Early Americans, what Lewis Binford would term "middle range" archaeological analysis. However, there are broader questions that can be addressed with this same data. One of the first is how the groups living through the climatic changes at the end of the Pleistocene epoch changed their resource utilization strategies to accommodate a less diverse set of faunal resources. This is a broad question, but it has very specific derivative questions. For instance, one could easily ask -- How did hunting technology change from Early Paleoindian to Early Archaic times? The side-notched points we find on the Page/Ladson soil are far more prevalent throughout Florida than are the earlier lanceolate points. What does this reflect: a change in resource utilization from megafauna to deer, a population expansion, the persistence of the side-notched tradition for a longer period of time, or some combination?

Let us first look at the transition from megafaunal to deer utilization. It seems clear that, at least in the Southeast, deer bone tools and food remains co-occur with Bolen-style points, indicating that they were an important subsistence and industrial resource. However, side-notched points do not occur with megafaunal remains. This suggests that Bolen-style points are potentially a specific adaptation to hunting deer. It also suggests that the tools for which the points were intended were physically different than those used with the lanceolate points. Data from the Page/Ladson site confirms this general picture, with the technological transition appearing to occur prior to the early date of 10,200 BP we have on the site. Other sites in the Southeast like Dust Cave and Stanfield/Worley Rockshelter in Alabama indicate that the development of side-notched points, such as Dalton and Hardaway, came after the development of some types of lanceolate points.

If the transition occurred sometime before the Bolen Surface at Page/Ladson was occupied, then we know it was the people who manufactured side-notched points that survived some of the most dramatic climatic shifts around 10,000 years ago. Expanding populations is another hypothesis used to explain larger numbers of side-notched points in Florida. If a small hum group occupied the Page/Ladson site on at least a seasonal basis, it would be the first evidence we have of a well-preserved campsite in Florida. The site's physical location, on a relatively small river in North Florida, tends to support the proposal that populations were expanding the range of habitats they used for food.

It is likely that overall population was the driving force to settle these previously only intermittently used areas. As populations expanded in "core" settlement areas, off-shoot groups settled less desirable areas.

Another alternative explanation is the persistence of the side-notched to comer-notched tradition over a longer period of time than previous lanceolate traditions. Recent radiocarbon assays and calibrations indicate there is a substantial plateau in dates of 10,400 and 10,000 years in age.

This means that this 400 years may represent as much as 1,000 chronometric years. This is easily enough time to accumulate the larger number of side-notched points, even assuming no population growth.

The impact of the late Paleoindian finds from the Page/Ladson site will be substantial, not only revising our understanding about human use of the immediate area around the Aucilla River, but also altering our ideas of regional settlement patterns and adaptations.

Sloth Hole site update

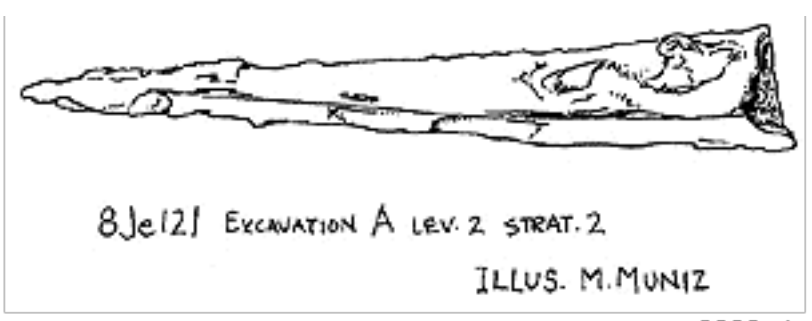
By Andy Hemmings

The excavations at Sloth Hole (8JE121) by the ARPP blossomed into a month long field season during the May/June operations because of the discovery of what appears to be butchered mastodon bones associated with a 12cm bifacial knife (see fig. 1) and a huge, battered hammer-stone. We also recovered many other artifacts and mastodon remains from the alternating thin beds of sand and grey organic clay we call level 4.

Level 4 is up to 20cm thick with as many as 74 microstratigraphic layers. No datable vegetation has been recovered but we hope to submit a bulk level 4 sample for a date on the fine organic clay. A single native vitis seed from the bottom of Level 3C was dated by BetaAnalytic to 4450+/-60 RCYBP. We know then that at the very least the sand layers have been capped and undisturbed for nearly 5000 years. Needless to say these in-situ mastodon and artifacts generated a great deal of excitement around camp as well as with members of the scholarly community with whom we have discussed it.

M Muniz

Fig. 1 *Bifacial chert knife*



M Muniz

Fig. 2 *Rolled copper projectile point*

On the margin of the site we set the 2x3 meter rail track in shallower water. While removing the leaf overburden we found a Seminole, rolled copper point called a Kaskaskia (see fig.2). William Owen Gifford saved this point on the screen. Thanks to his amazing breadth of knowledge this rare artifact was correctly identified in the field. Farther down, in the 3rd level of Unit 21, Frank Willson and I found a complete greenstone, groundstone axe. Both of these artifacts are quite a bit younger than what we are looking for. However, they do serve as excellent markers for the stratigraphic sequence and its intactness. Clearly this site had been visited for many millennia. Levels 4 through 7 were grey clay and sand levels that had a number of lithic artifacts, but none as yet are diagnostic.

At this point it does not appear that the rail track excavation contains a buried living surface. But it makes an excellent stratigraphic control section of the right age. A carbon date of 12,300+/-50 RCYBP was obtained on a piece of wood from the bottom of Level 7. One goal in the next field season at Sloth Hole will be to open adjacent areas just above the 12,000 year old level and obtain a large number of carbon dates.

One particularly interesting discovery in the lab was a tooth of an extinct llama form 58cm the 12,000-year-old level. Although there is no evidence of cultural association it is still an important find. Very few forms of extinct fauna from the late Pleistocene have such closely associated dates. At the very least we hope to bracket the tooth with dates from layers above. This could be the "youngest" dated Paleollama in the eastern United States.

A third unusual artifact was recovered near the mastodon while clearing back leaf and sand overburden to the top of Level 3. Alyssa Martinelli pulled a complete bone fishhook from the screen full of leaves before it was lost overboard.

Heretofore we had guessed that the upper peat and leaf layers were culturally sterile. This season's work clearly demonstrates that this is not the case. These artifacts probably got to the site as lost or discarded items. The fishhook being lost in use is logical and the copper point may have been fired and gone astray. The axe is more difficult and rather defies explanation.

A third area that received attention was a middepth deposit of wood and clay that included a palm stump still rooted in the ground. Unfortunately this inundated land surface dated to 30,920+/-230 RCYBP. The stump itself was 34,760+/-1600 RCYBP. Above these ancient strata is a well developed sequence of sand/gravel, peat, and leaf mold layers. Near the stump we found many bones of a single juvenile mastodon. Some of this area had been disturbed and it seems unlikely that the skull is still there. This mastodon has very few artifacts around it and at this time does not appear to be killed or butchered. One fragment of a thin biface was found in this level and is probably a paleo type, possibly a Suwannee preform.

A great many mastodon bones and several diagnostic artifacts from every level were recovered this year. The potential we thought this site holds is starting to bear out. Admittedly we are rather tentative in our discussion of a possible mastodon butchery but we are greatly encouraged by what we found last summer. As soon as we can get back to Sloth Hole we have three areas to excavate that all seem ready to help answer our questions about Paleoindians, extinct megafauna and their late Pleistocene associations.

Little River site updates

By Mark Muniz

The Green Lantern site was excavated from May 30 to June 3, 1996 as the third of a series of excavations in Little River that had as their goal, the further exploration of sites with a high potential for the preservation of Paleoindian activity. The third? You are probably wondering. The first intensive survey/excavation of archaeological site in Little River by the Aucilla River Prehistory Project was conducted at the Matten/Childers site 8Je604 in 1990. The Latvis/Simpson site, excavated in 1995, was the second large scale operation with which many of you are intimately (if not regretfully) familiar (see C.A. Hemmings). From years of diver collection and surface surveys, it was clear that Little River held multiple occurrences of artifacts in association with extinct fauna, the only problem was (and still is) finding this association in a secure stratigraphic context. Thus it was decided that 1996 would be the year to blitzkrieg Little River with the equivalent of Phase 11 surveys of five sites, four of which had not been excavated before.

The Green Lantern and Crag Hole sites, 8Jel507 and 8Je638 respectively, were excavated almost as one continuous site due to their immediate proximity. The primary goal for both sites was to determine if there were any intact paleosols present, similar to that of the Bolen paleosol at Page/Ladson. A paleosol is an ancient soil that was exposed to the air as a modern soil would be, but was then capped in such a way that its structure and surface were preserved intact. Without a paleosol, or some other distinct intact surface to associate artifacts and features with, cultural material would seem suspended in the space of whatever matrix we encountered it and would offer us few clues as to its context or associations.

Other goals were to measure enough data points to create a bathymetric reconstruction of the sites (see fig. 1), and to date the sediments present at each site.

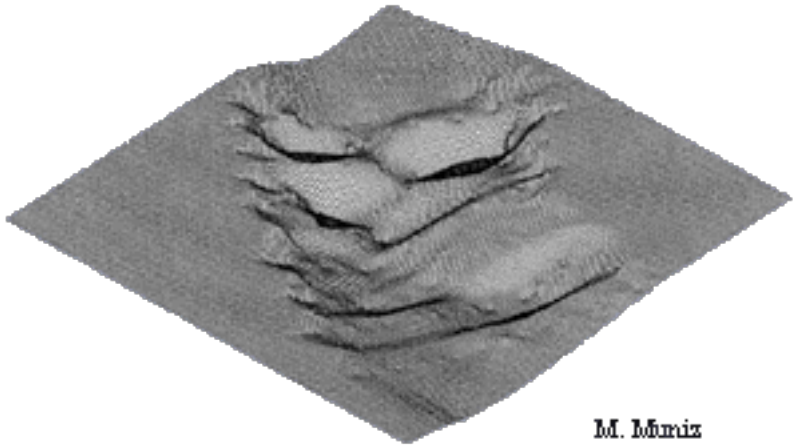


Fig. 1 *Three-dimensional computer model of Green Lantern(8Je1507) and Crag Hole (8Je638) site bathymetry. View looking northeast*

June 7 was the last day spent at Crag Hole, and I am proud to say that we accomplished all of the goals we had set for the two sites. Unfortunately we encountered no paleosols or other subaereally

exposed surfaces at the targeted time frame (12,000-10,000 hp) but this in itself was not at all a failure in any sense. Going into these unexplored sites, there is no way of knowing if there will be any intact Paleoindian remains, therefore, even by learning about a site that is not what you are looking for, much information is gained about the geologic history of the river, effects of hydrology on the behavior of artifact and bone beds along the bottom of the river, and the strategic elimination of another site that does not hold “da goods”. Dates for the clays at Green Lantern came back at >40,050 bp and 37,430 +/-560 bp. Although one sediment sample remains to be carbon dated, it is likely to be too old. Dates on the clays at Crag Hole are 41,560+/- 920 bp, 37,690+/- 910 bp, 37,160+/710 hp and 32,660+/-1,230 bp. Interestingly these dates coincide with a glacial maximum that was of shorter duration than the final Wisconsinan glaciation and may prove to be quite influential in the sedimentation of the Aucilla River drainage.

The remainder of the June field season (June 9-14) was spent at 8Je604, the Matten/Childers site. This site is home to "Priscilla," a nearly complete mastodon recovered from the bottom in the 1970s by Don Serbousek. The site was also dove by Billy Mathen and Ron Childers in the 1980's for whom it was named (with a slight misspelling that embedded itself in the site file name and unfortunately stuck). The site was investigated by the ARPP in 1990 to rediscover the sediments that once held Priscilla and to explore the possibility that cultural material would be found in association.

While the survey/excavation was successful in defining the area that held Priscilla, and recovered an immense amount of bone pins from the area, no radiometric dating of the site was conducted, and all assumptions regarding Priscilla's demise remain speculative. Evidence leading to human association with the Mastodon included an impact fractured Clovis point, and ivory embedded into the distal end of the left ulna of the mastodon! Clearly, more work needed to be done at 8Je604.

Three main areas of investigation were opened up in June of 1996: the first was well to the north of the 1990 excavations, in a lily pad bank along the west side; the second was just on the downstream side of a shallow rocky shoal, due east of the Priscilla site itself, where a previously capped spring was uncovered; and the third was due west of where Priscilla lay, along with a gradual slope of the channel. Throughout the course of excavations, two more areas would also be looked at, but these primary three loci would tell us the most information. While we were not able to reconstruct a bathymetric profile, a map was made of the bottom features of the site which greatly enhanced the previously skewed interpretation of exactly where the 1990 excavations were in relation to other channel features.

The final day at Matten/Childers witnessed a violent rainstorm that ended excavations early, necessitating a third and final trip that is planned for May 1997. Radiometric dates

from 8Je604 came back as 1,450+/-70 bp on a sample taken from above the spring in a gray clay matrix immediately to the east of the Priscilla locale; 100.5+/-0.6% bp from a sample taken at the bottom of a peat/sand stringer sediment that covered artifacts and megafaunal remains on the gradual slope of the west side of the channel; and finally, a date of 24,010+/-460 bp on a sample taken from the brown peaty clay that lay just below the Priscilla mastodon in a trench excavated during the 1990 ARPP explorations. Although this last date is quite old, it does not mean that the mastodon was not killed by people utilizing Clovis technology, it only means that either the activity itself took place on an eroded land surface, or, there is no longer any sediment remaining that dates between 12,000-10,000 bp. This question will be resolved after the 1997 return visit.

The final two sites on our whirlwind tour of Little River are 8Je603, affectionately known as Little River Rapids, and 8Je602 known as Ladson Rise. As we patiently waited for water levels to drop following a late season tropical storm, there was little prospect of accomplishing anything at all on Little River. But as the fates would have it we began excavation at 8Je603 on October 24 and ended 11 days later on November 3. Unfortunately we were not able to thoroughly explore Ladson Rise, however, it will probably turn out to be intimately connected with 8Je603, and incorporated within its overall excavation.

Little River Rapids was chosen as a priority site to excavate as a result of a surface collection conducted by Craig Willis and the Paleontological and Archaeological Research Team of Florida (PART) in 1987. This project collected 1,013 formal artifacts (over 950 of which were bone pins and bone pin fragments) and 21.647 kilograms of debitage (much of which are unrecorded blades and utilized flakes).

With such a high number of artifacts and debitage, it is clear that this was the site of a major activity center. Exactly what activities were occurring here will be the major thrust of my masters thesis, and will require further site excavation and some re-analysis of the artifacts collected in the 1987 survey to say with any certainty.

The October excavations allowed us to establish where intact strata remained and provided us with radiometric dates of the ages of the strata. The ARPP crew also faced a challenge that had not yet been a major factor on the river; the extreme current raging across the site as a result of Tropical Storm Josephine's passage Although there is no white water on the surface, after one dive it is obvious why they named this site Little River Rapids, as several divers (who will remain unnamed) have been seen moving downstream at quite a rapid pace! I think everyone who dove during the October field season (and especially those mad dogs who volunteered to dive doubles) should give themselves a pat on the back for conquering a daunting task. Kudos to all!

Fortunately, further excavations at the site will take place in areas that are sheltered from the current (along the west bank and on land). A very important outcome of the field

season was that for the first time we tracked the movement of artifacts from their original position in terra firma, into an erosional collapse in two to three feet of water, down a series of shelves and out into the channel bottom.

Never before had this series of site formation processes that eventually lead to artifact and bone beds on the bottom, been so accurately observed. I would like to mention a special thanks to Joan Herrera, whose patience and perseverance (while digging in water so shallow her tank was dry) led to the discovery of the first artifact in this transitional context.

While multiple carbon samples and cores were collected from the site, at press time we have only three dates. From one meter below the channel bottom in Unit 5, wood was dated to 4,850+/-70 bp. This may turn out to be a depositional sequence similar to that at Sloth Hole, and is definitely on the agenda for the coring operation in 1997.

Another date of 36,370+/520 hp came from a wood sample taken from the very bottom of Unit 2. This unit had several abrupt strata changes, and there may still be intact terminal Pleistocene sediments present above the stratum that produced the date. final date is 28,490+/-240 bp on a sample of exposed surface sediment at the bottom of the small sinkhole in the south-western area of the site.

In 1997 the site will undergo further testing with a coring project slated for early in the year, and a series of land excavations to be held in the spring. As of yet, Little River still holds its secrets from us, but the telltale signs are everywhere.

As we have seen, strewn across the bottom of the current is 40,000 years of history, but locked in the banks is the key to understanding the great transition from the Pleistocene to the Holocene and the people that survived it and went on to settle the Southeast.

Understanding Carbon 14 dating

By Mary Hudson

The first of the three periods are the prehuman records, well-represented by the Latvis/Simpson Site in Little River. It provides an excellent record of fossils and sediments representing Aucilla life in the range of 30,000 years ago. The most important sites for the ARPP are those that feature the earliest human cultures. We have now identified at least five substantial Paleoindian sites, one or two in each of the three segments of the Aucilla River. Each Paleoindian site demands more carbon dates, meticulous documentation and thorough excavation. And thirdly, the ARPP has discovered several sites that represent human cultures and their environments after the terminal Pleistocene extinctions of the big mammals.

The interpretation of data in the field of archaeology is often subjected to intense scrutiny. And when the interpretation of a site directly depends upon its estimated antiquity, the methods by which its age was determined become crucial. The following discussion focuses on Carbon 14 dating, the most widely used method of age estimation in the field of archaeology.

Carbon 14 (hereafter C 14) was developed by the American chemist, Willard F. Libby at the University of Chicago in the 50's, for which he received the Nobel Prize in Chemistry in 1960. C 14 dating provided an accurate means of dating a wide variety of organic material in most archaeological sites, and indeed in most environments throughout the world. The method revolutionized scientists' ability to date the past. It freed archaeologists from trying to use artifacts as their only means of determining chronologies, and it allowed them for the first time to apply the same absolute time scale uniformly from region to region and continent to continent. Many older archaeological schemes were overturned with the advent of C 14 dating. Today it is possible to date sites, such as those studied by the ARPP, well back into the late Pleistocene with reliable and accurate chronologies.

The element carbon is abundant in nature, and is a basic building block of all living things. Like many elements, carbon exists in nature in several different isotopic forms. An isotopic form is an element with the same number of protons in its nucleus (and thus similar chemical behavior) but with a different atomic weight, due to a different number of neutrons in the nucleus. For example Carbon 12 (hereafter C 12), the most abundant isotope of carbon, has six protons and six neutrons in its nucleus. Its atomic number is six, and its atomic weight is 12. C 14 has two extra neutrons. C 12 accounts for 98.89% of all carbon on earth (including carbon dioxide in the atmosphere). Seven other isotopes make up the other 1.11% of the global carbon budget (see fig. 1). The abundance and stability of C 12 make it an ideal reference point for comparing with its unstable isotope C 14.

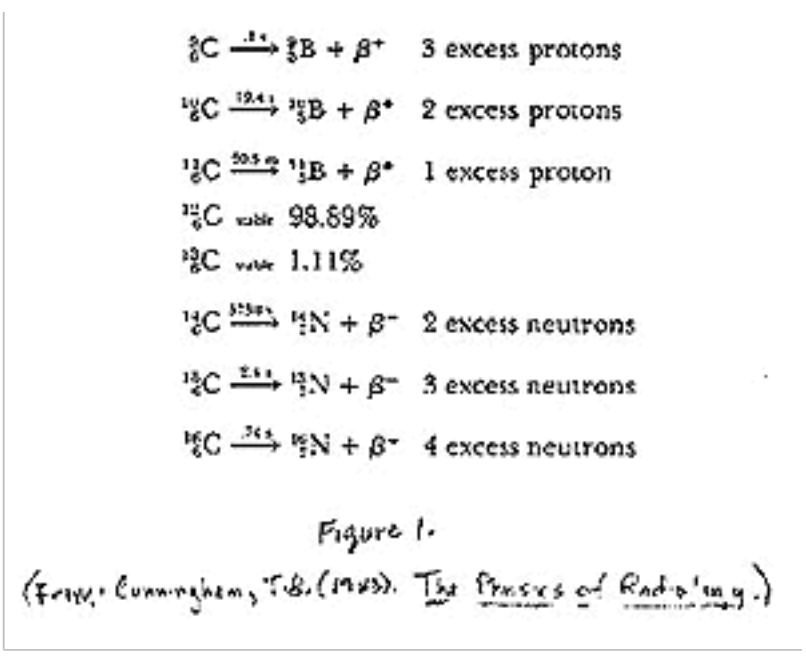


Fig. 1 *Isotopes of Carbon. Reprinted by permission from* The Physics of Radiology *by Harold Elford Johns and John Robert Cunningham. Published by Charles C. Thomas.*

C 14 forms in the upper atmosphere when cosmic rays strike nitrogen. When nitrogen, with atomic number 7 and atomic weight of 14, is struck by a high energy neutron, it absorbs the neutron and emits a proton. This transforms it to a new element of atomic number 6, which, as we know, is carbon. But this carbon isotope has the atomic weight 14. Its two excess neutrons cause it to be very unstable, and it will eventually experience radioactive decay, changing back to the stable element nitrogen.

As C 14 circulates through the atmosphere, mostly as carbon dioxide, and is perhaps taken into the sea or transformed into plant tissue by photosynthesis, it behaves just the same as C 12. Over time, however, the number of unstable parent nuclei of C 14 decreases. This decay rate, as for other radioactive isotopes, is a constant, which can be measured in the laboratory. The rate of radiation of a given sample steadily reduces as the number of unstable nuclei steadily declines. That makes it convenient to measure the decay rate in terms of half-lives. The half-life of C 14 is 5,730 years. That is one of the reasons that C 14 dating is useful in archaeology, whereas potassium or uranium isotopes with much longer half-lives are used to date really ancient geological events that must be measured in millions or billions of years. The number of half lives that can be measured reaches practical limits at about nine or ten, when there is too little radioactive material left. Thus, dates derived from carbon samples can be carried back to about 50,000 years.

In recent years physical chemists working on carbon-dating have devised a new method of measuring C 14 decay. The TAMS method combines (in tandem) a particle accelerator and a mass-spectrometer (you can figure out the acronym from this sentence, if you wish). The spectrometer recognizes the energy and mass characteristics of any element, in this case C 14, and then submits the selected element to a particle accelerator where the decay particles are individually counted. This very precise method can count radioactivity from very small samples and does not bum the samples up, as with traditional dating methods. For example, ARPP used TAMS to date the oldest gourd seeds featured in the National Geographic Magazine.

The decision whether to use the older (beta counting) methods or the new TAMS method depends largely on the size and value of the sample to be tested. In general only a few milligrams of carbon are needed for TAMS dates, as compared to several grams of pure carbon for the older methods. Another advantage is that in a composite carbon sample, a peat bed for example , the TAMS method can date one individual particle at a time. On the other hand, TAMS dates cost two or three times as much as ordinary dates. And that is why (near the back of this issue) ARPP has solicited your help to afford some of these very special new carbon dates.

Despite the wonderful new world into which C 14 dating has brought us in the past 40 years, the method must be carefully integrated into the entire field operation. The carbon date is no better than the site stratigraphy from which it was sampled. Stratigraphy, the science of how strata accumulate in the earth's crust, forms the foundation of field archaeology. Dr. Vance Haynes' excavations and stratigraphic analyses of Blackwater Draw in 1983-84 and 1990-94 provide an outstanding model of good field archaeology. His procedures illustrate the intricate and important phasing of precise excavation, exquisite attention to sedimentary detail, and an abundance of C 14 dates cleverly placed throughout the fabric of the site. In his classic study of geoarchaeology at the Clovis Type Site in Blackwater Draw, New Mexico, Profess Haynes includes in his field strategy "core drilling, archaeological test excavations, stratigraphic profiling, sedimentary analysis, and radiocarbon dating" (Haynes, 1995).

The ARPP strives to emulate Professor Haynes in our underwater excavation of Paleoindian sites. We must continue to follow Hayne’s model for phase and detail of excavation, and we must acquire dates and more dates at every phase. We have had an interdisciplinary approach from the start. Our entire team, from scientists to graduate and undergraduate students, managers and supervisors, advisors, volunteers and political and financial supporters are all topnotch. Important too, is ARPP's dedication to education at all levels. We have what it takes to make this a world-class project.

Haynes, Vance. 1995. Geoarchaeology of Paleoenvironmental Change, Clovis Type Site, Blackwater Draw, New Mexico. *Geoarchaeology*, 1995 volume.

Geography's role in archaeology

By Lance Carlson

So many times, people come to me and ask, "What does a college student of geography do?" The first thing I must explain is that the field of geography is much different than the world it is portrayed to be on shows like Jeopardy. Geography is more than memorizing the capitals of every state in the union and the names of every country on earth. Such facts require mere memorization.

Geography used to be purely descriptive, 'drawing maps and representing places with symbols and scales. Today, geography is one of the fastest moving disciplines, which explains, analyzes, manages, and even predicts! Yes, in some ways geographers are like fortune tellers. They read special types of maps to predict what may happen in the future. In business today, geography is one of the hottest topics. In dealing with demographics, land values, site locations, environmental hazards, and much more, geography is utilized and has a proven track record. After all, business wouldn't use it if it did not produce a level of utility greater than what it costs. What does it do for archaeology?

Anything having to do with spatially referenced data falls under the auspices of geography. We have implemented geography at the Aucilla and didn't even know it! The ARPP has obtained aerial photography of the Aucilla River in stereo coverage. Stereo coverage simply denotes that when viewed under a mirrored stereoscope or used in conjunction with a zoom transferscope, the z-coordinate jumps out at the viewer; in other words, the viewer has a three dimensional perspective of the terrain. This has proven helpful in finding archaeological sites in other projects.

Within the ARPP I have taken these photos, which are at a very large scale (1:9600), and transcribed them onto paper. This has allowed us to gain much better information on sites for development of site maps since the best maps heretofore were USGS 1:24,000 series. Detail in a such a smaller scale map (small scale shows large area) is too crude for our purposes.

The next step in geographic technology is to develop a Geographic Information System (GIS). GIS is a computer mapping and modeling program. A good example of this is ESRI's Arc/Info program which is currently utilized by many planning agencies around the world. Many people compare GIS with AutoCAD, because AutoCAD allows one to draw maps. But GIS is different and more powerful in the sense that it can be manipulated by its database, and this gives GIS it's predictive capability. Beyond

obtaining hardware, software, and technical proficiency in a GIS program, one must ask what it can really do. The process begins with the base map produced from the aerial photographs. This base map is taken to a digitizing board integrated with the workstation that is running the Arc/Info software and digitized. The important information to have at this point deals with obtaining solid ground control points in the field. The way in which good ground control points are obtained is by utilizing a Differential Global Positioning System (DGPS). DGPS reads latitude and longitude coordinates and can be accurate to within a foot or less. Usually a solid topographical or man-made feature is chosen that can be referenced on the map as well as the ground. This is where the coordinates are shot.

The next step comes in the computer lab. The lat./long. coordinates are transferred to Universal Transverse Mercator coordinates (UTM), which the Arc/Info GIS reads. This is all done on the digitizing tablet and the workstation. Now the base map is spatially referenced with ground control points. The actual digitizing or drawing of the map comes next. Using the digitizing puck, the outline of the map is traced by a sequence of many tics (like dots), often over 10,000 on a single base map. The system draws the map by utilizing these tics, nodes, and polygons.

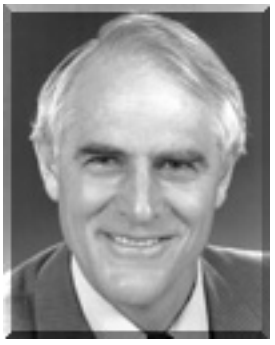
Once digitized, this map can be blown up, reduced, and manipulated in over a thousand ways. It is much different then drawing a map by hand and having the final product being set in stone.

I hope to create a three dimensional computer model of the Nutall Rise basin, and obtain bathymetric data that is also spatially referenced for inclusion into a GIS. This would allow us to pinpoint excavations in the river. Then every time a unit is set or an artifact is found, a spatially referenced measurement will be taken using a GPS and bathymetric profiler.

The important thing to keep in mind is that whether on land or under water, spatially referenced data falls within the discipline of geography. And it is Geography that is poised to be on the most powerful and useful tools in the near future. Its potential applications in archeology are just beginning to be appreciated.

New insights from isotopic ecology

By S. David Webb



Field excavations in the Aucilla River provide the rich records of Florida prehistory upon which the ARPP program is predicated. Recovery of such records, however, is only the first of three stages through which our adventurous enterprise passes. The second stage involves a variety of processes in the museum; these include conservation of the samples, computerization of field records, cataloguing of specimens, and other curatorial procedures. The third stage includes all the analysis and interpretations that ultimately enrich our understanding of our prehistoric heritage. These are now beginning to unfold, and will be most evident when the ARPP produces its first full-fledged book, now contracted with Plenum Press, but still about two years in the future.

One of the advanced studies that is providing new insights into the prehistory of the Aucilla River region is known as isotopic ecology. Dr. Paul L. Koch and Ms. Kathryn A. Hoppe, an advanced graduate student, both in the Department of Earth Sciences at the University of California in Santa Cruz, have analyzed carbon and oxygen isotopes in tooth enamel of five species in late Pleistocene levels at the Page/Ladson Site. The oxygen isotope ratios (between atomic weight 16 O and 18 O), microsampled in one mammoth tooth, reflect temperature fluctuations, and the lower temperatures are correlated with slow (winter) growth enamel bands. The stable isotopes of carbon (13 C and 12 C, not 14 C which is unstable, i.e. radioactive) generally indicate the percentage of grass vs. leaves, or, in other words, whether an animal was a grazer, mixed-feeder, or browser. Aucilla mammoth diets, according to these results, consisted of about 90% tropical grasses. Mastodons, on the other hand, were almost purely browsers. In this respect the carbon isotope data confirm the direct evidence, previously reported, from presumed mastodon digesta.

A surprising result was that horses teeth had a mixed diet, about half browse and half tropical grasses. Although this seems surprising, the Santa Cruz team obtained similar results from horse teeth from three other late Pleistocene sites in the Florida peninsula. Tapirs and deer were even purer browsers than the mastodon.

In another study, just begun, late Pleistocene deer diets will be compared with those from the early Holocene, when, according to the Aucilla River site records, deer became the dominant large mammal and was much more extensively hunted by early humans. Our hypothesis is that deer diet will reflect a broader spectrum of fodder, including occasional grazing, after the extinction of the rest of the megafauna.

As Seen In

The New York Times

A 10,000-Year-Old Site Yields Trove of Data in Florida

By John Noble Wilford

Finding what they are calling a 10,000 year-old underwater time capsule, scientists at the University of Florida think they have caught a rare glimpse of how people in North America responded to the last catastrophic climate change, at the end of the most recent Ice Age.

With the onset of warmer temperatures, their world changed all around them. As distant glaciers melted, the sea rose and encroached on their land. The savanna they once knew in what is now the Southeastern United States turned to thick forest, depriving them of familiar resources and offering new ones. And the mammoths and mastodons they hunted vanished.

Forced to give up biggame hunting, these Paleoindians looked for other food and settled into less nomadic lives. They began living in villages, developing new stone and bone tools and a variety of wooden implements. Adversity seemed to have stimulated innovation.

This moment of transition from the Ice Age to today's climate is unusually well preserved at a site in the Florida Panhandle, at the Aucilla River south of Tallahassee and near the town of Perry. The site was discovered by paleontologists and archeologists led by Dr. David Webb, an anthropology professor at the University of Florida in Gainesville.

Dr. Webb said the site appeared to have been a village by a pond, where people lived for only a few generations about 10,000 years ago. Then rising water levels probably flooded the village and sealed the remains under a protective layer of clay, There they remained undisturbed until now, and the clay seal was so tight that a surprising number of wooden artifacts survived.

These pieces, including what appear to be tent stakes, building poles and part of a canoe,

are among the earliest preserved wooden artifacts. At most archeological sites of this age, such wooden materials have usually decayed long before.

"We are especially impressed by the density and diversity of all the artifacts," Dr. Webb said in an interview on Saturday.

U.F. Information Services

Two University of Florida researchers, Brinnen Carter and Mark Muniz, with artifacts that were found preserved in a layer of clay in the Florida panhandle near the town of Perry, south of Tallahassee in the Aucilla River. The 10,000-year-old implements revealed details about life at the end of the last Ice Age.

Mark Muniz, a graduate student excavating and analyzing the site, said that radiocarbon dates showed that the settlement's existence was confined to a few generations and was never reoccupied later.

"Having such a short time period gives the opportunity to reconstruct how a specific group of Paleoindians in time were living and what they were manufacturing," Mr. Muniz said. "And this is such an extraordinarily rich mutation that it feels as if we're excavating right on their front porch."

Dr. Dennis Stanford, an anthropologist at the Smithsonian Institution, who specializes in Paleoindian cultures, agreed that the site could provide an incomparable picture of people adjusting to severe climate change, moving from Ice Age big-game hunting to a more settled life and diverse economy. Similar patterns have been detected in excavations in Texas, though those remains are not nearly as well preserved.

The new discovery, Dr. Stanford said, "sounds pretty exciting" and should yield many new insights into this critical period.

At the time, Paleoindians on the North American plains were still hunting large game, like bison. In the Middle East, people were also beginning to settle into villages and experiment with growing crops and domesticating animals for food.

The Florida archeologists found the new site by excavating the west bank of the Aucilla River at a water depth of about 15 feet. Before the end of the Ice Age, the Florida landscape was much drier, as determined by pollen samples, and the peninsula was nearly twice its present size. The village site was nearly 100 miles from the coast then, compared to its present distance of five miles from the Gulf of Mexico.

So far, the archeologists have found that a large but uncounted number of people lived close together in the village, in contrast to the nomadic ways of only a few generations before. Around an intact hearth were remains of past meals including a roasted turtle bone. Arrowheads and spear points made of flint -- but unlike the Clovis-style of earlier big-game hunters -- were uncovered, as well as stone tools.

Dr. Webb estimated that the artifact density at this site is at least 20 times greater than in lower layers representing occupations by earlier people. The excavations are supported in part by the National Geographic Society.

Brinnen Carter, another graduate student studying the site, said the evidence showed these people to be learning how to survive on smaller animals and different plants.

"Essentially, they were the first humans that weren't big-game hunters," he said.

Divers hunt prehistoric man in Florida river

By Diane Hirth - Tallahassee Bureau, Ft. Lauderdale Sun-Sentinel

AUCILLA RIVER -- In a place so steamy that shoe leather gets moldy almost overnight, an ancient river of tea-black water laps over perfectly preserved bones more than 12,000 years old.

The Aucilla River follows a quixotic path in north Florida, plunging underground several times before flowing into the Gulf of Mexico.

For geologist and zoologist David Webb, it has become a river of prehistoric dreams, revealing clues to when and how man and mastodon met 500 to 600 human generations ago.

Snaking along the mostly wild edges of Jefferson, Madison and Taylor counties, the Aucilla has produced what may be the oldest evidence of human culture in North America: a 12,200-year-old, seven-foot mastodon tusk butchered with deep cuts that pushes back previous estimates of the advance of Paleoindians into the New World; an incised and beveled spear-shaped piece of ivory; a fish hook made from a large animal bone.

"We're starting to span the interval when the big extinctions occurred. Maybe we'll tease out the answer of whether man was causing these extinctions," says Webb, a University of Florida professor and curator of fossil vertebrates at the Florida Museum of Natural History.

"Did they hunt to death the big animals in a few centuries? I think that's the big question laid at our feet.

"This is a quiet, wet place that preserves a lot of stuff."

The mystery that might be unmasked by fragments found in the Aucilla mud is what occurred between 10,000 and 12,000 years ago. In the middle of that time, mastodons, mammoths, giant Sloths, horses and camels disappeared from this hemisphere after grazing here for millions of years.

Until Webb's research, the generally acknowledged oldest artifacts confirming man's presence and his hunting of large game were 11,200 to 11,500 years old, from the Clovis site in New Mexico.

But this chapter of prehistory remains faint. Elsewhere in the eastern United States, for instance, the artifacts of long ago generally have been plowed over or eroded away.

"I go about it as a geologic prospector would," Webb says of his attempt to dissect a distant time. "It's just like a good murder mystery"

Other scientists have dismissed Webb's style of river archeology, unable to see beyond the swamprot setting and the jumbled juxtaposition of beer can and mastodon bone at the river's bottom.

Sure, one might find a handsome spear point or the remains of an extinct beast, but hasn't the river churned everything together into an indecipherable thousands-of-years-old stew?

"The old bugaboo that professors started was 'There is no good science in the bottom of a river.' Pottery and beer cans. and ivory together are a meaningless jumble to an archaeologist," Webb says.

"So the professors basically walked away from it because they said it was not impeccable, not dateable."

It took time for Webb to become a believer in the scientific worth of this river's relics. But he was fascinated by the amateur divers and collectors and their amazing finds: "They had guts. They were like old pioneers. They'd go down in the darkest waters where you couldn't see anything. They led us to the right places.

"It was like coming awake slowly," he says. Finally, Webb flashed on the notion that careful dissection of Aucilla riverbed could work. That's because he remembered collecting skeletons of mastodon and mammoth from river as far back as 1970, "our mammals were in place, in sediment. They hadn't moved for 12,000 years."

Webb is careful to employ much of the same plodding techniques used at archaeological sites on land.

Ten years ago, he and an ever changing band of volunteers and students began carefully digging, trowel by trowel, into meticulously laid-out grids on the river bottom.

Each spring and fall, they come for about a month -- swatting at biting deer flies and scratching rashes left by lush poison ivy that crowds the riverbanks.

To pierce the black shroud of water, the divers use 1,000-watt lights.

And much of their gear is improvised to fit the watery conditions. The dredge sucking up river silt is modified gold-mining equipment.

"Everyone thinks about the romance and adventure of Indiana Jones," says Webb, a lean and tan 59-year-old. "But all of this is work, incredibly tedious work, to make it stick. It's like a lawyer preparing a case. If anything, we've been too slow and cautious.

"And for every 10 hours spent on the river doing excavations, there are 90 hours spent back in the museum cataloging the specimens and preserving them so they don't crack or break."

At the river site, sediment layers and their contents are meticulously documented. A grape seed, a gourd seed, a nut, chunks of wood -- all have been found preserved in the layers and all are useful for accurate carbon dating.

Working in up to 40 feet of water, Webb and the other divers dig as deep as 15 feet into the river bottom.

At one key site, each millimeter of sediment below the water equals about a year. One meter? One millennium. And so on. Five is about 5,000 years. One area of the river that's mapped is 37,000 years old at its base.

For a visitor, there's little to see besides bubbles on dark water, marking where the divers are. A volunteer is out on the "screendeck," a floating barge where the silt is sifted and doublechecked for anything missed down below.

Occasionally, though, Webb's crew rigs up an underwater TV camera, and one can see a murky picture of excavations as they occur.

Webb's obsession has a name, the Aucilla River Prehistory Project, and a newsletter. It receives money from both National Geographic Society and the Florida Secretary of State's division of historical resources.

But aside from the formality of the scientific quest, there is a cockeyed enthusiasm here that reminds one of a little boy digging rocks out of the mud.

It is what lures the volunteers who have kept this operation alive.

"Yes, there is a good science going on", says Joe Latvis, who was a volunteer diver for years before becoming project operations manager.

"But there's some kind of magical spark, too. Just to know these were deposited in a world much different than today is a transcendental experience. I don't mean to be too nutty about it, but you realize you are the first person to look at something that may have been from just after the Ice Age peaked ... That's the fire that burns in the belly of folks like myself."

What today is a flowing river was once a series of isolated sinkholes lined with rocks, peat and mud. That's a key reason why much of the critical evidence here wasn't washed away.

Webb scribbles on a yellow pad with professorial enthusiasm and gestures excitedly with his hands as he goes through some questions that the Aucilla may answer about the hunters who wandered across the Bering Strait and down a narrow ice-free corridor about 15,000 years ago.

Were human migrations first to the east or west? How early were men, women and children definitely in what is now known as Florida? How sophisticated were their weapons? Did they use spear throwers? Was there a human caused "prehistoric blitzkrieg" that caused the big mammal extinctions?

"We used to think the earliest people were much more tied into nature and less technically sophisticated. But things were going along quietly without much change, and suddenly, boom!

"If humans show up and 200 years later everything is wiped out, it shows you a ferocious people. There are theories that human overkill wiped out the mastodons. We think we've got evidence in this river that will help sort this out."

Spotlight on research diving: Aucilla River Prehistory Project

By Joseph Latvis, Project Operations Manager

AMERICAN ACADEMY OF UNDERWATER SCIENCES
the SLATE
NEWSLETTER OF THE AMERICAN ACADEMY OF UNDERWATER SCIENCES

The earliest Paleoindian explorers to enter the New World over 12,000 years ago exploited their Ice Age environment, particularly the menagerie of exotic animals they found here in such apparent abundance. Yet by 10,000 bp undeniable climatic changes had occurred, sea level had risen dramatically and the terminal Pleistocene extinction had taken its irrevocable toll on the great herds.

Since its inaugural year in 1983 the Aucilla (aw-sil'-uh) River Prehistory Project (ARPP) has annually conducted underwater research into the archaeological, paleontological and paleoenvironmental aspects of the Pleistocene/Holocene transition in Florida. Sponsored by the Florida Museum of Natural History, the ARPP in 1995 continued its exploration of one of the New World's richest, best preserved records of this important era.

The venue for this research is the Aucilla River drainage basin, located in the Gulf (of Mexico) coastal lowlands of Florida's Big Bend area, 45 miles southeast of Tallahassee. Under the direction of University of Florida co-chief scientists Dr. S. David Webb and Dr. Jerald T. Milanich submerged sediment banks 24 feet thick continue to yield a wealth of information in exquisite detail. The infinitesimal incremental rates of sediment deposition (grossly averaging 1 mm per year) include items as fragile as intact grape tendrils and gourd seeds 30,000 years old. The state of anaerobic preservation of such botanical materials enables radiocarbon dating techniques to firmly fix the timeline.

Underwater excavation is accomplished using traditional terrestrial troweling techniques, illuminated by a surface-powered 1,000-watt Snooper light to penetrate the tannic stained darkness at 30-foot water depths. A hydraulic dredge is employed by the excavator to carry away sediment tailings and to control suspended particulate. The tailings are discharged onto a screendeck barge at the surface, where they are continuously monitored and sampled. Fossils, artifacts and botanical materials exposed on the bottom are mapped, still-photographed and videotaped in place before removal and conservation. In situ sampling for bulk sediment analysis and radiocarbon dating is performed at stratigraphic intervals not exceeding 20 cm.

Diving is accomplished using surface air supply to AGA masks, backed up by completely independent scuba rigs. Wireless communication units fitted to the AGA masks coordinate routine activities of the dive team with surface support personnel, as well as providing an additional layer of safety to the operation.

University of Florida's Dive Safety Officer Dr. Robert Millott placed the resources of the Diving Science and Safety Program at the disposal of last year's ARPP operation, certifying 15 new project volunteers, including instructors, divemasters, research divers and divers-in-training, all to AAUS standards. Dive locker support and trained personnel from the Academic Diving Program at sister institution Florida State University also played a significant role in last year's success.

Approval in 1995 of a substantial multiyear grant from the Florida Department of State, Division of Historical Resources, in addition to continued funding from National Geographic Society and unprecedented private benefactor support greatly expanded the project's ability to safely and efficiently explore these world class sites. During the sixteen weeks of field operations conducted last year a record-breaking 557 dives were logged, accumulating 794.6 hours of total bottom time; all without a single dive-related accident.

Volunteers are recruited from academia and the avocational community in order to maintain a crew of 10-12 divers and 2-4 non-divers every day of our monthlong, and six-weeklong campaigns. In 1995 forty-five hardy souls came from all walks of life across the nation, donating their time and talent for anywhere from five days to six weeks. Volunteer application forms for the 1997 field season (May 6 through June 20 and October 6 through November 1) are available via the project's annual news magazine, The Aucilla River Times. A free subscription is available upon written request from:

Florida Museum of Natural History
Attention: Dr. S. David Webb
University of Florida
Gainesville, FL 32611

Volunteers from institutional members of AAUS are easily integrated into the project because of the reciprocity umbrella.

ARPP Live Presentations

1996-1997	Place	Presenter	Type of Talk	Attendance
1996--January 31	Tallahassee (Downtown) - Rotary Club	Webb	Popular	300
March 7	Gainesville, FLMNH - Paleo Lunch Bunch at Museum	Carter	Educational	30
March 20	Gainesville, UF - Geology Class	Webb	Educational	32
March29	Gainesville, UF - Ecolunch	Webb	Educational	28
May 15	Allandale, SC - Big Pine Tree Excavation	Carter	Educational	40
July 3	Perry, FL - Kiwanis	Latvis	Popular	45
July 23	Tallahassee - FL A&M University	Dunbar	Educational	11
October 10	Gainesville, UF - Geology Class	Webb	Educational	32
October 17	Tampa - Florida Fossil Fair	Dunbar	Popular	1,200
October 22	Perry, FL - Taylor County Board of Commissioners	Latvis	Popular	100
November 2	New York, NY - American Museum Society of Vertebrate Paleontology, Symposium on Evolution of Proboscidea	Webb	Educational	350
November 9	Gaineville, UF - Paleofest (Florida Paleontological Society)	Webb, Dunbar, Hemmings	Popular	90
November 24	Toronto, Ontario, Canada - Marine Museum of Upper Canada Save Ontario Shipwrecks, Toronto Chapter	Monk	Avocational	25
1997 -- January 14	Wakulla, FL - Wakulla Historical Society	Dunbar	Popular	
February 15	Seattle, WA - American Association for Advancement of Science, Archaeology Symposium	Dunbar	Educational	
February 20	Tallahasee, FSU - Academic Diving Program	Dunbar	Educational	
March 1	Tampa, FL - Tampa Bay Fossil Club	Dunbar	Popular	
March 4	Tallahassee - FSU	Dunbar	Archaeology	
March 6	Wakulla, FL - Explorer Scouts Post 909	Dunbar	Educational	
March 9	Gainesville, UF - Archaology Week Museum Classroom, 2 pm	Webb	Popular	
March 19	Gainesville, FL - Rotary Club (Heritage Club)	Webb	Popular	
April 5	Nashville, TN - Soc. American Archaeology	Carter	Educational	
May 21	Arlington, VA - Airlie Conference Center	Webb	Educational	

ARPP reenacts "A Naturalist in Florida"

By Joan Herrera

Members of the Aucilla River Prehistory Project crew assisted filmmakers from WUFT, Dennis Gaston (videographer) and Dennis Ogle (Engineer Sound Man), in reenacting scenes from the life of renowned naturalist Dr. Archie Carr. A joint project of independent producer, Letitia Langord, and WUFT, this one hour television documentary, based on Dr. Carr's literary work "A Naturalist in Florida: A Celebration of Eden", will air later this spring on UF's channel five. The program will also be made available to all channels in the state of Florida and around the southeast.

On April 10th Dr. David Webb, Joe Latvis, Andy Hemming, Lance Carlson and I joined Dennis and Dennis at Rainbow Springs for filming. Dr. Webb made his acting debut, in the role of Archie Carr, skin-diving among waving fronds of rivergrass and discovering fossil mastodon teeth among the shoals. Joe Latvis, our head dive master, trusty underwater videographer and holder of innumerable other esteemed titles (many of which mean he gets to do everything the rest of us won't) handled the filming of underwater scenes, while Dennis Gaston shot film footage from the shore. Lance and I acted as safety divers, watching the action, and making some effort to stay out of the scenes. Daytrippers swimming at the springs fit into the picture nicely, but our tanks and bubbles did not jive with the scene because this reenactment was from a time, before the advent of SCUBA gear, when local skin-divers, including Dr. Carr, used a window pane stuck in a piece of innertube as a dive mask. Dr. Webb used a "relatively" modern dive mask stuck in innertube for the reenactment. Andy was confined to the land crew with a cast he had to keep dry (as dry as possible) and he acted as boat tender.

After spending an extended time filming in the 72^{o} water, Dr. Webb, clad only in swim trunks and looking rather blue, exited to the bank and spent the rest of his time trying to warm up. The rest of us, toasty in our wetsuits, continued down the run scouting for fossils and artifacts, and allowing Joe the chance to record footage of the spring's plant and animal life. We saw turtles and several species of fish, including some large spotted gars.

Archie Carr is best known in scientific circles as a sea turtle biologist. He was a Professor of Zoology at the University of Florida and one of the main Biological Sciences Buildings on the UF campus is named in his honor. Carr Hall is home to the Archie Carr Sea Turtle Center and is located behind the Florida Museum of Natural History. The Center continues his work and has ongoing research projects around the world studying sea turtle biology and conservation. Dr. Carr was also well known as a

naturalist and the author of several books. He worked in many areas around Florida and on the beaches of Costa Rica. Filming for this special on his life of was conducted at various sites around the state, including the Everglades, Cork Screw Swamp, Melbourne Beach, and Ichetucknee Springs. The Archie Carr National Wildlife Refuge is located just south of Melbourne. Some of Dr. Carr's popular works are available in local bookstores and this legacy continues his mission by introducing new generations of readers to the wonders of natural Florida and instilling in them an increased awareness of the environment and conservation.

Since our time at Rainbow Springs, Dennis Gaston filmed an interview for the program with Dr. Webb at Ichetucknee Springs. Stay tuned for more information on when the special will be aired. Our filming on the Rainbow river was an exciting day and one I am sure we will never forget, especially Lance. We on the Aucilla Project were privileged to be invited to participate in the telling of the story of a great Floridian who made a real and lasting contribution to the conservation of endangered animals and natural resources both in the State of Florida and around the world.

Diving for fossils with Archie Carr

By Archie Carr

Excerpted from Audubon, *85, no.2 (1983). Permission to reprint courtesy of National Audubon Society.*

It was back in a time before tubing; before the Crackers started storming up the spring runs in boats with ten-horse Johnsons; before Cousteau perfected his first scuba regulator - a time so far back that the face mask through which I saw was only a circle of window pane in a headpiece cut from an inner tube. In those days it was enough just to ride down with the stream and look for things to see and never see a single beer can from Ichetucknee Springs to the Santa Fe. I hung belly down in the air-clear stream and looked at the bottom slipping by, one moment a waving yellow-green of a naiad bed or the sudden red of water purslane, or moving soft horns of pinktipped coontail set with slim cones of spiny snails.

It is a fine sight down through new spring water. One of the sad parts of my lot is that goggling needs more drama than pretty plants to stir my slight metabolic fires and keep off the dire sickness of the skinny skin diver - the ague we used to call the "big shakes".

There was that day, for instance, a long run with no break in the water gardens - no bone-strewn riffle or shards of Indian pottery or Suwannee chicken cooter shying at my passing with nothing there but the man-killing cool and the sweetness of a spring run at summer noon. The zeal began chilling out of me, and I thought how welcome a fire on the bank would be, and a chocolate bar; and the bottom began to look like only wet plants. Then an eddy swung me over a bed of stonewort and I felt the prickle of the little leaves, and the smell made one of the queer smell-imprints that stick hard forever; so that now, to me, the faintest scent of stonewort or even of some sorts of onion soup brings back the sight of the big molar tooth lying there on swept sand beyond the stonewort bed, with all its roots and cusps, and its enamel shining as if a big man had lost it the day before. It was the tooth of a mastodon, and the heat came back in me at the sight. I worked back along the edge of the sluicing channel, dived and grabbed the tooth and rode the current down to slack water. Then I stood there knee-deep in more musk grass, turning the fossil in my hands, looking back plainly to a time when real giants lived in the Suwannee Valley land. The tooth was half the size of a football - too big for the bag that held my match bottle and chocolate bars - but its being so ponderous and such sure proof of different times had warmed me, and I dropped back into the current to ride on down, with the four pound tooth held tightly in one hand. There was a quarter-mile of smooth travel, with now and then a Suwannee bass rolling his red eye

from under a jutting log or a sprinkling of silver minnows all nose-upstream in the channel edge, or a moss-thatched stinkjim craning his neck to scramble from under my slipping shadow. Then suddenly I slid over another swept shallow and in a litter of meaningless pieces of brown bone saw bulk like a shaped lump of coal half out of the dark sand bottom. I clawed back to a point upstream from the object, dived, and rooted out the chunk of shiny black with my one free hand. Then I kicked away downriver to feel for shallow water and see what the new find was. When my feet found bottom, I gulped air, scratched the mask off, and stood studying the object.

It was clearly a piece of another tooth, but it was very different from the first. It had an undivided root, and the crown was crossed by repeated low, wavy ridges instead of high cusps. One end was broken off, and I was barely able to summon the lore to know that this, too, was a bit of Proboscidean, a relic of some elephantkind of another sort. It was the grinding molar of the big Columbian mammoth. I thought the matter through, and then stood there in the suck of the current with bits of two Florida elephants in my two hands. I was so fired up by the coincidence and the triumph that the water stayed warm as new milk for the whole mile down to the landing.

(This scenario from several decades ago was reenacted and videotaped underwater by ARPP personnel last spring. Some of the footage will appear in a one-hour tribute to Archie Carr's life as Florida naturalist to be aired on Public Broadcast System television stations late in 1997.)

ARPP open house activities

By Alyssa Martinelli and Tammy Montes

The highlight of every field season is the open house. We look forward to sharing our experiences with those who may not be acquainted with the workings of the day-to-day operations, as well as presenting the current season's accomplishments. Our guests come from all over -- biologists, fossil buffs, sign painters, students, members of the Florida Congress, attorneys, former volunteers and other archaeologists.

One of our goals is to heighten the knowledge of the general public, as well as to show our sponsors and dignitaries the importance of supporting underwater archaeology projects like this.

Some activities of the 1996 open houses include: On-site tours given by Project Director and Co-chief Scientist Dr. S. David Webb; complete with a live action video presentation of what the divers were doing so all of us non-divers could view the underwater site. We were especially fortunate in having been able to host the fall Open House at all, considering that the Aucilla River had been above flood stage for quite some time after Tropical Storm Josephine hit us head on.

Several presentations were made to outstanding members of the project for their significant contributions to the project's success:

Long-standing ARPP benefactors Buster Herlong and Bubber Bailey were each presented a display of artifact replicas created by the project's student staff.

Jack Simpson was presented with his very own 'Gator' projectile point.

Joe Latvis was presented with an inscribed copy of A Naturalist in Florida: A Celebration of Eden by Archie Carr.

J. Simpson

Mark Muiz presents recognition award to Buster Hancock.

Fossils, lithics and other artifacts including a fiberglass casting of a mastodon's footprint were on display; compliments of Dr. S. David Webb, the Florida Museum of Natural History and Jack Simpson.

J. Dunbar

Tammy Montes launches an atl atl spear while Hank Kratt watches for the Mastodon to fall.

Learning to throw an atl atl has become a big hit at the open houses, especially trying to spear the giant mastodon target. Just imagining what it was like throwing this atl atl as a giant mastodon came closer and closer toward you was quite awesome. Official results of the June '96 Open House competition are posted on this page.

Thanks to Jim Dunbar and Andy Hemmings for the use of their atl atls.

Our most favorite part of the day was eating Bill Gifford's good 'home cooked' food (Mastodon burgers!). We were also treated to Bill's famous bar-b-que, hot dogs, various salads and a cake smothered in 'Gator' colors.

All in all, we could not have asked for better weather at both the spring and fall open houses. The sunny warm weather made for a nice relaxing day spent by the river observing the wonders below.

Spear-Throw Results

Distance:

First Place: Andy Hemmings 78.5m

Runner-up: Ollie Carlton 53.5m

Accuracy at 30 meters:

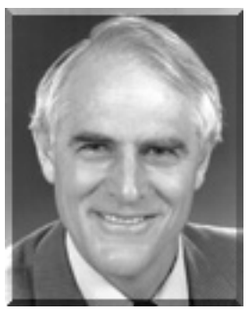
First Place: Jerry Gramig, Jr.

Runner-up: Ian Tuttle

We would like to thank everyone at ARPP for the wonderful opportunity to learn about this area's first residents. Never in ten thousand years did we think of the friendships we would form right here at the Aucilla River Prehistory project.

New insights from isotopic ecology

By S. David Webb



Field excavations in the Aucilla River provide the rich records of Florida prehistory upon which the ARPP program is predicated. Recovery of such records, however, is only the first of three stages through which our adventurous enterprise passes. The second stage involves a variety of processes in the museum; these include conservation of the samples, computerization of field records, cataloguing of specimens, and other curatorial procedures. The third stage includes all the analysis and interpretations that ultimately enrich our understanding of our prehistoric heritage. These are now beginning to unfold, and will be most evident when the ARPP produces its first full-fledged book, now contracted with Plenum Press, but still about two years in the future.

One of the advanced studies that is providing new insights into the prehistory of the Aucilla River region is known as isotopic ecology. Dr. Paul L. Koch and Ms. Kathryn A. Hoppe, an advanced graduate student, both in the Department of Earth Sciences at the University of California in Santa Cruz, have analyzed carbon and oxygen isotopes in tooth enamel of five species in late Pleistocene levels at the Page/Ladson Site. The oxygen isotope ratios (between atomic weight 16 O and 18 O), microsampled in one mammoth tooth, reflect temperature fluctuations, and the lower temperatures are correlated with slow (winter) growth enamel bands. The stable isotopes of carbon (13 C and 12 C, not 14 C which is unstable, i.e. radioactive) generally indicate the percentage of grass vs. leaves, or, in other words, whether an animal was a grazer, mixed-feeder, or browser. Aucilla mammoth diets, according to these results, consisted of about 90% tropical grasses. Mastodons, on the other hand, were almost purely browsers. In this respect the carbon isotope data confirm the direct evidence, previously reported, from presumed mastodon digesta.

A surprising result was that horses teeth had a mixed diet, about half browse and half tropical grasses. Although this seems surprising, the Santa Cruz team obtained similar results from horse teeth from three other late Pleistocene sites in the Florida peninsula. Tapirs and deer were even purer browsers than the mastodon.

In another study, just begun, late Pleistocene deer diets will be compared with those from the early Holocene, when, according to the Aucilla River site records, deer became the dominant large mammal and was much more extensively hunted by early humans. Our hypothesis is that deer diet will reflect a broader spectrum of fodder, including occasional grazing, after the extinction of the rest of the megafauna.

Wild world of the Aucilla

By William Gifford

Three days prior to the 1996 May/June field season, Gene Rowe, Jack Simpson and I met at Nutall Rise to prepare all the equipment required to run the project. Although this is a lot of work, it does afford one the opportunity to enjoy the beauty of the area in relative peace and quiet. Once those dredge motors, generators and boats start running, the serenity of the Aucilla River is gone for the vast majority of the day.

In the late afternoon of these quiet times you can observe the spectacular displays provided by the local wildlife. Two birds that I had searched for unsuccessfully as an avid birdwatcher for over twenty years are the Peregrine Falcon and the Mississippi Kite. During this time of year, both birds are in transition. The Peregrine is preparing for its journey north for its breeding season, and the Mississippi Kite is returning from its winter vacation in Central and Southern America. The open field next to the Ladson house affords a unique opportunity to observe both of these species as they relentlessly scoured the treetops in search of an easy meal.

The Peregrine hunts from a considerable height above the trees. Once they zero in on a small bird they plummet from the sky in a dazzling display at speeds up to 260 mph. The Mississippi Kite hunts in another manner. It skims the treetops looking for unwary insects, birds, rodents and reptiles. They are beautiful to watch in action, but make you glad to be higher up on the food chain.

As the archaeological field season came into full swing we moved out to work on the river, and were unable to watch these terrors of the sky. But the change in habitats offered new and interesting sights.

The first site we worked was Sloth Hole on the west run of the Aucilla River. This section of the river is a transitional area where the habitat begins to change from southern bottomland hardwoods swamp to marsh as the river meanders along to the Gulf of Mexico.

One of my duties as a divemaster on this project brings me to work closely with Joe Latvis on the maintenance of the gear and to guard it at night on the river. Although this requires much extra time traveling the river to take care of all our other duties back at Nutall Rise, it does allow us some of these quiet moments that become so rare as the season progresses.

Awakening aboard the project's 20-foot pontoon barge to the early morning stillness of Sloth Hole brought me in contact with another elusive bird that I had pursued for many years, the Prothonotary Warbler. Their melodic song and golden orange color brightened my every morning at this site. They nest in tree cavities and busily pursue insects and caterpillars to feed their young. Green caterpillars seemed to be a great favorite, and they captured them by the hundreds. While watching them one morning, I saw a warbler go for a black one. It rapidly spit it out and used the branch it was on to wipe the apparently vile taste from its beak. An obvious lesson, I never observed this behavior again.

In the little bay on the west side of Ward Island where we docked the boats that we worked off of were a wide variety of the plants that characterize this area. A fallen Carolina Ash became a nursery for three other types of trees that used the rotting trunk as compost to get a foothold on life. Farther along the shoreline, as the land became wetter, was a small group of wildflowers known as Lizard's tail. This showy little plant has a drooping spike covered with hundreds of tiny white flowers. In association was a grouping of Pickereweed with a backdrop of hundreds of Spider Lilies. Behind the boats was a small stand of Red Maples on the shoreline giving way to large groups of River Cane. The shores of the river were at one time dominated by Tupelos and Bald Cypress, but after the heavy foresting this area has seen, there are few prime examples today.

J. Davidson

Bill Gifford surveys the Aucilla shoreline for interesting botanical specimens.

During a foray into the interior of Ward Island, (the division of the west and the east run of the Aucilla) Mike Nolan encountered a rare inhabitant of the swamp, a Blue Striped Ribbon Snake. Found only from east Wakulla county to the Withlacoochee River, it was a welcome change from the Water Moccasins that seem to dominate the swamp.

One of the phenomena encountered by everyone that dives Sloth Hole is what we have affectionately dubbed "black snow." Once you hit the bottom, a cloud of this organic particulate rises and snows on you for the rest of your dive. While hampering your visibility (what doesn't), it is an important component of the detrital food chain. Eight to ten tons of leaves per acre fall here every year. A tremendous number of organisms feed on this energy rich mass. Crustaceans, insect larvae, and worms feed and die here and add even more food for the thousands of organisms that follow. The feces that are released into the water are known as fine particulate organic matter. Combined with dissolved organic matter from the leaves they are the basis of the food chain that provides life to the myriad of organisms for this ecological system.

Traveling from the site to the main camp at Nutall Rise every afternoon we were treated to the sights of Kingfishers and Pileated Woodpeckers going about their daily routines with little regard to our invasion of their homes.

Two wildflowers of note were the Swamp Rose and the False Dragonhead. Both are abundant along the shoreline and added contrast to the vibrant greens of the swamp. The Swamp Rose grows in large clumps of thorny vines that cascade into the water with multitudes of pale pink flowers. The False Dragonhead has spikelike racemes with pink to rose purple flowers on three foot high stalks.

Upon finishing at Sloth Hole we moved back to Nutall Rise and transferred operations to Little River. I moved back into my tent next to the Flamingo Lounge. The lounge is a screened in room that Steve Glover and I erected to provide an area that gave a little respite from the constant chaos of the main cabin. With our plastic flamingos and yard sheep, it was like home and offered solace to weary divemasters at the end of the day. Little did we know that it would provoke a relentless stream of practical jokes inflicted upon us by a small but determined group of student terrorists.

Needless to say that when John Davidson came into the cabin as I was cooking dinner one evening to tell me of a large insect outside, I was reluctant to go see it. I had visions of Andy Hemmings swinging out of a tree disguised as a large biting fly to inflict a nasty bite on my neck.

Only after ascertaining the whereabouts of Andy, John and their cohort Mark Muniz did I dare venture outside to look for the insect.

Much to my delight I found a two inch long fly with a four inch wingspan and mandibles that reminded me of a mastodon's tusks. I immediately captured it for closer examination and identification.

With the aid of Andy's insect guide we were able to determine that we had found an Eastern Dobsonfly.

The Eastern Dobsonfly breeds along rivers and streams east of the Rocky Mountains, laying a hundred to a thousand eggs at a time on alders, willows or other woody vegetation. After dropping into the water as larvae, they spend two to three growing seasons feeding on the bottom of the river. They emerge as pupal cells to live through the winter among rocks or logs and emerge as adults in the summer.

Fortunately this was a male, as the female with shorter mandibles is capable of inflicting a serious bite.

The Little River section of the Aucilla is on the Ladson property and is a purer bottomland swamp than the lower sections. As it was later in the summer we were visited daily by Swallow Tailed Kites that nest in the adjacent areas.

One of the most graceful of raptors, their acrobatic flying skills always leave me with a sense of awe.

Due to editorial constraints, I cannot list all the plants in this section of river that I might like, but one bush demands a little attention. The Buttonbush, a salt resistant shrub that grows throughout the state, has rounded flowerheads covered with numerous tiny white flowers. This bush is particularly significant, in that a twig from one of these bushes was used to carbon date our oldest evidence of human occupation to date.

In the fall we returned for another exciting season of excavation on the river. On the first day of setting up on the Sloth Hole site I looked up to see a flight of over three hundred Wood Storks headed south along the coastline.

Shortly afterwards I wished I had been going with them. The unpredictable and sometimes fickle weather of Florida dealt us another blow in the guise of Tropical Storm Josephine. Having already been on the periphery of two hurricanes in my short time as a member of this project, I was not prepared for the ferocity of the inundation we received.

When we were finally able to get back in the water at Little River Rapids the conditions were severe and only through the hard work and determination of this excellent group of people could we bring to conclusion another successful year of excavation.

Thanks to the continuing support of the Ladson family and our Site Manager Jack Simpson we will be allowed to return to what some may think of as an insect and snake infested swamp but I find to be one of the most special places on this planet.

What is a hammock?

By Rhonda M. Brewer

The Aucilla River is a beautiful place to work and to learn. The river and its surrounding flora and fauna are good for the soul; a "classroom" backdrop such as this is conducive to learning, and hard work is never dreary, simply because of the beautiful environment.

The crew is always on the lookout for birds to watch and plants to identify. Having grown up in the city and suburbs of Cleveland my notion of wildlife consisted of the occasional squirrel and artificial deer lawn ornaments. I quickly became aware of my ignorance concerning nature, especially Florida wildlife, which was a constant source of amazement to me (I was astounded by the size of the insects, not to mention the size of the bites they left on my body).

Many lively discussions take place after dinner when the work is done; topics vary from the intellectual to the inane (a result of hard work). One night I was thumbing through a wildlife book as talk surrounded a bird we had seen cruising over the boats earlier that day; I came across the word "hammock." In an effort to get a quick answer, I asked the crew what a hammock was and received two different definitions.

In order to clarify the meaning I did a little research and this is what I found.

According to Webster's Ninth New Collegiate Dictionary, the word hammock is derived from hummock, but the exact origin is unknown. It is defined as "a fertile area in the southern U.S. and esp. Florida that is usually higher than its surroundings and that is characterized by hardwood vegetation and deep humus-rich soil."

Victor Shelford echoes this definition in The Ecology of North America (1963) and adds a list of important trees typically found in hammocks which include southern magnolia, American holly, redbay, laurel oak, American beech, and live oak. Shelford also lists a number of trees, shrubs, vines and herbs that comprise typical understory.

In his book, A Naturalist in Florida (1994), Archie Carr, zoology professor and naturalist, states that in Florida a hammock refers to any hardwood forest, although the definition varies slightly depending on geographical area. In coastal Georgia the term refers to "a little island in the salt marsh, usually with red cedar, small live oaks, and saltbush growing on it" (Carr 1994:171).

In the Everglades a hammock refers to "isolated patches of small broadleaf trees, many of them West Indian species, in the sawgrass or maidencane marsh or limestone

pinelands" (Carr 1994:171).

In the remaining area of the south where the term applies, a hammock is "any predominantly evergreen woods that is composed of nonconiferous trees" (Carr 1994:171). Because coniferous woods such as pinelands and cypress swamps are so prevalent in the south, the term hammock is useful for distinguishing between these forests and the hardwoods; however, the term is less useful nowadays because so many of the hammocks are gone. Hammock soil is some of the most fertile in Florida; as a consequence, most were cut down long ago so that fan-farmers could use the rich soil, and trees could be used for lumber.

Hammocks are not extensive, and typically occur in narrow bands only a few hundred meters wide. The hammocks found in northern Florida contain "the largest numbers of species of trees and shrubs per unit area in the continental United States" (Platt and Schwartz 1990:194).

According to the article by Platt and Schwartz in Ecosystems of Florida (1990), although hammocks are typically designated as xeric, mesic, or hydric (which refers to low, medium, and high soil moisture respectively) these forests are more frequently defined by their location and vegetation than by moisture zone. Platt and Schwartz thus describe hammocks by their location along the topographic gradient: high (xeric), midslope (mesic) and low (hydric). All three have typical overstory and understory associated with them.

Thomas Barbour, naturalist at large, describes hammocks this way, "I love hammocks ... in the early spring, when the yellow jasmine festoons the forest trees and when the redbud and giant dogwoods and the maples are putting forth their vivid crimson foliage, I do not know of lovelier spots to sit listening to birds and resting in the heat of the day" (Barbour 1944:165).

I anticipate my return to the Aucilla River where I may once again enjoy the natural splendors that pristine Florida has to offer.

Water moccasins and the ARPP

By Mary Hudson

Early one afternoon during the May/June season, Bruce Allbritton and John Davidson were excavating down in the bottom of the railtrack, about 18-20 feet down, at the Sloth Hole Site. The weather was fair, and underwater visibility was about one meter, pretty good for Sloth Hole. Bruce was using the trowel and the dredge hose on the pit wall, while John held the light. After noticing that Bruce was waving the trowel, John moved in for a closer look, just in time to see a snake wrapped around Bruce's forearm! No sooner did this scary sight register, when the snake disappeared instantly up the dredge hose! Both divers, wide-eyed and shaken, made a rapid, yet controlled ascent to the surface, to see what had happened. Their first image upon surfacing was an empty, rocking screendeck ... and a lot of commotion! Apparently, the screendeck crew wasted no time in abandoning ship, and jumped onto the screendeck anchored alongside.

The snake had jettisoned from the dredge hose onto the screen, then bounced into the water, where it swam under the screendeck, across the water in front of the still shaken divers, and onto the bank, very close to the anchored pontoon boats, where it stayed. This snake was no weenie; even though it was probably as scared as everyone else, it still stayed its ground.

The snake, incidentally, was a cottonmouth water moccasin. Its scientific name is *Agkistrodon piscivorous conanti*. Known to be an aggressive snake, it is found throughout Florida, with a range extending north to Virginia and west to Illinois, Missouri, Oklahoma, and Texas. Its habitat encompasses wetlands and waterways, such as streams, springs, rivers, lakes, ponds, marshes, swamps, sloughs, reservoirs, retention pools, canals, and even roadside ditches. Occasionally it can be found rather far from the water, and has been found in trees and bushes. Cottonmouths feed primarily on fish, frogs, mice, rats, and other small mammals.

Often, cottonmouths are confused with water snakes, non-poisonous snakes who share the same habitats. These harmless water snakes are often killed out of fear and ignorance. Actually, cottonmouths are also often killed for the same reasons. Except for self defense or positive identification in the case of snakebite, it is best to leave all snakes alone. Snakes help keep the environment in balance. For instance, a shortage of snakes means an increase in the mice and rat population, which brings on epidemics of disease often fatal for humans. Also, picking up or attempting to kill a snake can be one sure way of being bitten.

The cottonmouth moccasin, when threatened, coils and opens its mouth wide, displaying its fangs and exposing the white interior of its mouth and throat, thus the name cottonmouth. The adults are dark colored, almost black, and are heavy-bodied. They range in size from 20-48 inches, with a record of 74.5 inches (over 6 feet.) Juveniles are brightly colored with reddish brown crossbands which contain many dark spots and speckles, and have a sulfur colored tail, which is held erect and wiggled like a caterpillar to attract prey within striking range. The pattern darkens with age, so adults retain only a hint of the banding or are uniformly black. Both adults and juveniles have a broad, dark facial stripe which camouflages the eye. The juvenile cottonmouth is often confused with copperheads because of their similar appearance. However, copperheads do not have the distinctive dark band over the eye, and the crossbands of the copperhead contain no spots and speckles. Further, the range of the copperhead in Florida is primarily in the panhandle, mostly along the Apalachicola River and its tributaries and in the western tip of the panhandle.

Cottonmouths are members of the pit viper family, which also includes Copperheads and Rattlesnakes. Pit vipers have several characteristics which distinguish them from non-poisonous snakes:

1. Half-inch hollow fangs which contain complex, poisonous venom.
2. There is a deep facial pit between the nostril and the eye.
3. The head is thick, triangular, and distinctly broader than the neck.
4. When viewed from above, the eye cannot be seen.
5. The top of the head in front of the eyes is covered with large platelike scales.
6. The pupil is elliptical instead of round.
7. Single, non-divided belly scales from the head to the tip of the tail.
8. Short, stubby tail instead of long and whiplike (Only Rattlesnakes have rattles).

In the past, snakes were rarely encountered by members of the ARPP. The 1996 May/June season, however, contained several incidents of water moccasin contact with ARPP members during routine endeavors. The notion that the noise of the motorized equipment and the presence of so many people would keep snakes away has been abandoned in a reality check, especially concerning the brazen and bold water moccasin described above. The very real possibility arises that someone may be bitten. In light of this realization, it is prudent to consider the implications of such a scenario. Education about pit vipers, what happens to a person who has been bitten, and emergency medical procedures in the field must be addressed for everyone's safety. The following information is contained in Protocol For Emergency Room Procedures And Hospital Management of Snakebites, written by Maynard "Snakeman" Cox, herpetologist and world-recognized poisonous bite expert.

Statistically, about 48,000 people a year bitten in the United States. Of these, about 8,000 are from poisonous snakes and an average of 10 people a year die because they are cared for improperly. Worldwide, about 40% of the time people are bitten by poisonous snakes no venom passes and 85% of the time only enough venom passes to make the victim sick. 15% require critical care in the acute phase of the poisoning Proper medical management is still not well understood by many people.

In the Florida series, about 10 people per year were bitten by a cottonmouth while reaching over the side of a boat to pull up a string of fish. Cottonmouths inflict most of their bite under the water, on top of the water, or near the water.

The height of snake season is between April and October, peaking between July and August. Snakes are generally less active at temperatures less than 50-60 degrees, or greater than 80 degrees. 70-77% of all bites occur between 9:00 AM and 9:00 PM, peaking between 3:00 PM and 6:00 PM. Anatomically 60% of all bites occur to the lower extremity 38% to the upper extremity, and 2% to unidentified sites.

The cardinal signs and symptoms of pit viper envenomation include: burning pain (the commonest, earliest sign), puncture wound (50% of the time accompanied by a bloody ooze), swelling, skin discoloration, nausea and vomiting, minty, metallic, rubbery taste in the mouth, sweating, chills, numbness and tingling of the mouth, face, scalp, and wound site, ecchymosis and production of blebs and blisters, erythema and edema progressing from the wound site, weakness, vertigo, haematemesis epistaxis, muscle fasiculations, paralysis, shock, convulsions, loss of sphincter control, melena haematuria, and renal shutdown. Envenomation may include some or all of these symptoms, depending on the severity of envenomation.

Death can occur up to several days following the bite, or in as little as two hours. In pit viper envenomation the average death occurs in two days. If the bite is inflicted in an artery, vein, lymphatics, or a nerve, death will occur in 30 seconds to 10 minutes. If the victim does not die within the first 10 to 30 minutes, you have excess of 12 hours to get to proper medical help; in most cases, severe complications or death will not occur if proper medical protocol is followed.

Maynard recommends the following:

A. Do not apply a tourniquet !
B. Do not cut and suck !
C. Do not apply ice !

1. Treat for shock.
2. Wash the wound with soap and water.
3. Call 911 or transport to the nearest medical facility.
4. Call Maynard at (904) 272-6398

Snakebites from poisonous snakes are extremely dangerous. Following proper emergency medical procedure in the field and prompt transport to proper medical care in a medical facility is essential. Avoiding being bitten in the first place by leaving snakes alone is good common sense. In the event that contact with a poisonous snake is unavoidable, as in Bruce's case, non-aggressive action is best. Bruce did not strike or aggravate the cottonmouth that was wrapped around his forearm, and luckily, the snake went up the dredge. Luckier still, the snake bounced off the screen into the water and no one topside was hurt. Additionally, although both Bruce and John were frightened by the snake, they did not bolt up to the surface. Being good divers, they kept their wits about them and tried to ascend in a controlled manner. Adding the complication of being bent to a possible snakebite would not bode well.

Hopefully, there will be no incidents of snakebites at the ARPP. Respect for our fellow snakes and using caution when around them will aid in avoiding such misfortune.

In the event a snakebite does occur, we know what to do, and more importantly, what not to do! Let's Dive!

In memoriam: Wilmer Wilson Bassett, Jr. 1915-1996

The Aucilla River Prehistory Project will deeply miss its wonderful friend and supporter, Wilmer W. Bassett, Jr., who passed away at the age of 81 on December 6, 1996. Born in Monticello and educated at the University of Florida, Wilmer was a leader in Florida Agriculture. He received many honors including the Bronze Star for his service as lieutenant colonel in artillery in World War II, induction into the Florida Dairy Hall of Fame, and the Distinguished Alumnus Award from the University of Florida.

With regard to the Aucilla River Prehistory Project, Wilmer provided the river cabin and other valuable funding. That cabin made all the difference in the project's effectiveness, for it allowed us not only to produce better meals but also to hold substantial educational activities in the evenings.

J. Hunt

Longtime ARPP enthusiast Wilmer Bassett with Page/Ladson mastodon tusk, 1993

Much to our delight, Wilmer himself played an active role in many ARPP activities. As an educator who had spent his life observing Florida natural history, Wilmer took an intense interest in the project's scientific endeavors and also showed genuine concern for the progress of its students. On his weekly trip through north Florida, he almost always spent an evening or two with our group, and this was always a big morale booster. It was also literally a "treat," because he insisted on providing three freshly baked pies. Aucilla River participants will long remember his "Dooby" pies, which uniquely provided enough calories to carry on the next day's dive.

Wilmer also led project members to garner support in legislative offices, and introduced them to civic organizations in Monticello, Gainesville and Tallahassee.

The ARPP and its readership wish to convey our love and support to his wife, Melda, his son, "Bill," his daughters Lucy, Mary and Carolyn, and to their families.

An outstanding naturalist, educator and businessman, Wilmer Bassett provided outstanding leadership to the ARPP, which we will never forget.

The Class of '96

By Mary Hudson and Dawn Pinder

We are always amazed by the wide variety of volunteers who show up at the Aucilla each year. A diverse group of individuals is always there to lend their expertise, personalities and enthusiasm to the project. The "Class of '96" is no exception. Here is a glimpse of this multi-talented group of individuals.

J. Simcox

One of the many ever-changing field crews from 1996. Standing from left: Diana Davis-Coleman, Brook Skrmpa, Bruce Allbritton, Lance Carlson, David Thulman, Andy Hemmings, Melvin Suggs. Kneeling, back row: Jon Latsa, Mary Gruchnour Hudson, Brian Woods, Gray Farr, Ed Green, Phil D'Silvestro, kneeling, front row: Jo Ann Suggs, Dawn Pinder, Mark Muniz, John Davidson and Don Munroe.

BRUCE ALLBRITTON.

TIM BARBER, 50, a retired race car technician, now works as a divemaster and underwater photographer in Tampa. He has long been an avocational paleontologist. Tim says "for me, the project is an opportunity to learn from a great group of folks."

JODY BARKER, of Orlando works as a welder. Jody sees the Aucilla Project as "a great chance to enhance the cooperative spirit between the professional and amateur."

VINCENT BIRDSONG, 27, of Tallahassee is currently working toward a Master's Degree in anthropology at Florida State University. He has worked on a number of archaeological projects ranging from archaic through late 19th century in the Mid Atlantic Region. Vincent sees the Aucilla Project as "truly unique."

RHONDA BREWER, 30, of Jacksonville is a first semester graduate student in archaeology/anthropology at Florida State University. In addition to this project she has also been involved in work at Fort Jefferson, Dry Tortugas.

LANCE CARLSON, 21, of Gainesville is a fulltime student at the University of Florida. In May, he will graduate summa cum laude (highest honors) in both anthropology and geography. He has been involved with other projects including the Cornell University underwater archaeology field school in Portsmouth, Maine. Lance served as Underwater Technology Specialist to the ARPP for the '96 season.

BRINNEN CARTER, 29, from Deland, holds a B.A. degree from Bowdin College, an M.A. degree from Texas A&M and is pursuing a Ph.D. from the University of Florida. He has been with the project since 1988.

DIANA DAVIS COLEMAN, 34, is an environmental attorney with the Florida Department of Environmental Protection in Tallahassee. Diana is an avid diver and amateur paleontologist. She says "participating on this project was quite an adventure. I enjoyed the camaraderie and willingness of the crew to answer questions."

BOB COUGHTER, 22, of Gainesville earned his Bachelor of Arts degree in Anthropology from the University of Florida. He has also been involved in a project in Panama and a survey in southwest Florida. Bob states 'the project (ARPP) continues to grow in importance as a source for gaining insight into the lifeways of the 'earliest Floridians.' "

JOHN DAVIDSON, 32, of Melbourne, has a B.A. in Anthropology from the University of Florida. He says "I've volunteered to do lab work several times at the Florida Museum of Natural History, but this is my first chance to actually do field work ' "

JASON DEES, 17, of Orlando is currently a high school sophomore. He has spent a great deal of time visiting museums and hunting for fossils. Jason "had a great time and can't wait to get back" to the ARPP field season.

PHILIP DIGIROLAMO, 27, currently a resident of Gainesville, received a Bachelor of Science Degree in Geology from the University of Massachusetts, and is now working toward a Master's Degree in Vertebrate Paleontology at University of Florida. He is excited to apply himself in the great tradition of volunteer/scientific research on the Aucilla River Prehistory Project.

PETER FRANK EDWARDS, 28, of Tallahassee has a B.A. in Anthropology from the College of Charleston and is completing an M.A. in anthropology from Florida State University. He has also spent time as a volunteer at Dill Plantation and the Nathaniel Russell House site in Charleston, South Carolina and on an unidentified wreck at Dry Tortugas.

GRAYAL FARR, 53 of Winter Haven, retired from the Army after 26 years of service. He holds a B.A. in history from Florida State University and has completed his first year of graduate school, majoring in archaeology at FSU. Grayal says he "never wanted to be anything but a soldier or an archaeologist."

BROOK GEORGE, 24, of St. Petersburg, FL, holds a B.A. in Religious Studies and is currently working on a Master's Degree in the same field of study. He worked two field seasons at the excavation at Sepphoris, Israel. Brook is currently writing a book on the development of religion from a socio-behavioral standpoint, which is proving quite controversial.

WILLIAM GIFFORD, 47, of DeLeon Springs is a dive instructor. He has participated on over 25 natural science projects.

STEVE GLOVER, 48, has a B.A. degree in English. He is retired from an advertising and graphic arts career. After spending time on the project Steve comments "I now have a notion of the magnitude of the work we have to do."

EDWARD GREEN, See VOLUNTEER SPOTLIGHT, page 26.

ANDY HEMMINGS holds a B.A. in Anthropology from the Univeristy of Arizona in Tucson and is currently working on his Master's Thesis featuring the archaeology and paleontology of Sloth Hole. He has been involved in a number of projects in the western United States and Florida.

JOAN HERRERA holds a B.S. Degree in Animal Science, a M.Ed. in Secondary Science Education and Curriculum, and is currently completing a Ph.D. in Zoology at the University of Florida. She has served as Divemaster for several University projects.

STAN HORD, 36, of Barberville, FL, is a broker and grower of decorative foliage. He has been involved in several Florida projects including the DeLeon Springs survey and the Markham Florida Riverboat survey. While in junior high school Stan did work for the West Texas University Paleontology Department.

MARY GOUCHNOUR HUDSON, 37, is a Radiation Therapist in Gainesville. She is currently enrolled at Santa Fe Community College as an Anthropology major and plans to continue studies at the University of Florida. Mary says an opportunity to be a part of this project is "a privilege and a blessing." As a newlywed, Mary is currently diving into new territory.

TOM KELLEY, 46, of Miami, currently lives in Tallahassee where he is a residential contractor. When not pursuing his interest in archaeology, Tom loves to fish.

ALYSSA MARTINELLI, 25, is an undergraduate in anthropology at Florida State University. The ARPP is her first field experience. She is "very proud to be associated with this project and learned a lot during my time here."

BILLY MAY, 69, works as a dentist in Richmond, VA. He has been involved with many projects all over the world including the Dry Tortugas, Bermuda, Ethiopia, Kenya, Belize, Turks and Caicos. Of this project he says it's the "greatest experience of my life."

LINDA MCCANDLESS, 44, works for USDA Agricultural Research Service Center for Medical/Veterinary Entomology as a research technician for stored grain pests. Recently she participated in Paleofest at the Museum of Natural History. She says she "is very glad to be part of the circus."

CHUCK MEIDE, 25, is working on his Master's Degree in Anthropology at Florida State University. He is studying underwater archaeology and teaches several underwater field research classes at FSU. Chuck has worked on dozens of underwater sites including shipwrecks in the Dry Tortugas, Mobile Bay, Alabama, and Texas.

MATTHEW MIHLBACHLER, 24, of Sigel, IL, has a B.A. degree in Anthropology and is currently working toward a Master's degree in Zoology at the University of Florida. He has been involved with various projects in Illinois and Maboko Island in Kenya. Matt sees the ARPP project as "an opportunity for students to leap ahead of their peers in research ability."

KIMBERLY MONK, 21, of Toronto, Ontario, Canada, currently works as a scuba instructor. She plans to pursue a degree in Anthropology. Kimberly feels that ARPP has "been the greatest project experience that an aspiring nautical archaeologist could ever be a part of."

TAMMY MONTES.

MARK MUNIZ, 23, of Gainesville, is currently enrolled in graduate studies at University of Florida, seeking a Master's Degree in Archaeology. During the '96 season Mark headed research on Little River. He believes work done on the Aucilla River will have a major impact on current knowledge of Paleoindians in the Western Hemisphere.

DON MUNROE, 46, holds a degree in Nuclear Engineering and works at the University of Florida as a radiation safety officer. This is Don's third year working on the project.

MICHAEL NOLAN, 34, of Pierson, FL is a broker and grower of decorative foliage. He has also volunteered with the DeLeon Springs Survey. In the fall of '96 Mike became the proud father of a beautiful baby boy.

THADRA PALMER, 21, is a full-time student at Florida State University working towards a B.A. in Anthropology. She has been involved in a variety of other projects while at FSU including Little Salt Springs and Marathon wrecks. Thadra is excited about the ARPP project and "can't wait 'til next season."

TANYA PERES, 23, is a graduate student in Anthropology at Florida State University. She is currently analyzing faunal material from the Page/Ladson site for her thesis. Tanya is an Archaeological Technician with the National Park Service, Southern Archaeological Center.

DAWN PINDER, 39, is President of Innovation Consultation, Inc., a Jacksonville consulting firm. She holds a Master's Degree in Social Work from Florida State University. This is her second year with the project where she lends her talents to managing the field office when not working the screendeck.

EUGENE ROWE, 67, a retired veterinarian from Richmond, VA., has been on close to 50 scientific projects worldwide, most with Earthwatch of Watertown, MA. The ARPP is one of his favorites because of the "good science and methods." Gene thinks "we are near some important revelations."

BRAD STACKPOOLE.

JO ANN SUGGS, of Brandon, FL, is a full-time housewife who raises turkeys and is "big on flowers." She and her husband Melvin have a second home on the Aucilla where they plan to retire. Jo Ann showed quick reflexes during the summer field session when she dodged a snake that came up through the dredge and onto the screen.

MELVIN SUGGS, of Brandon, FL, works as a technician (mechanic) with Reynolds Metal Company. He loves to fish and turkey hunt, and raises turkeys to gain insight into their behavior in the wild. Melvin and his wife Jo Ann plan to retire to the Aucilla River. Melvin says while at the ARPP, he "didn't meet anybody he didn't like."

DAVID THULMAN, 41, is an environmental attorney with the Florida Department of Environmental Protection in Tallahassee. He has always been interested in paleontology and prehistoric archaeology, and this project is a perfect mix of both. "The people are terrific and the science is great, and except for the bugs, the setting is beautiful." He hopes to participate for years to come.

SUSAN TUTTLE, 52, holds a B.A. in Anthropology from the University of Florida and a Master's Degree in Special Education from FSU. This is her first experience in the field, and she says "it is wonderful to be there." In her spare time Susan enjoys sailing, painting and flying.

BINION WILLIAMS, 54, of Jacksonville is a Production Controller at Jacksonville Naval Air Station. He holds a B.S. in Business Administration. Bin likes to spend his free time outdoors hunting, boating, fishing and camping. The ARPP gives him one more excuse to pitch his tent.

FRANK WILLSON, 69, of Lake County, FL, has a B.S. in chemical engineering and is retired from the petrochemical industry. This is the second year on the project for Frank and his wife Lois. Frank has also volunteered for the DeLeon Springs Project.

LOIS WILLSON, 65, is a retired legal secretary. Lois is always welcome on the project because of her incredible cooking skills. The crew never goes hungry when Lois is on "kitchen duty."

BRIAN WOODS, 29, of Northern Ireland now lives in Minneapolis, MN, where he works in the banking industry. He holds a B.A. in history from the University of Minnesota and an M.B.A. from the University of St.Thomas in Minneapolis.

Volunteer spotlight on Edward M. Green

By Dawn Pinder

If you work the screen on the Aucilla River Prehistory Project, the first person you meet (and most knowledgeable and helpful teacher on the project) is Ed Green. His vast years of experience have lead to the development of screendeck observational techniques that provide valuable insights into sediment characterizations as reported by diving excavators. Ed shares his knowledge with each new screendeck volunteer.

Ed has been a loyal and steady volunteer to the ARPP since 1989, when he volunteered to assist with land surveys. He recalls finding three projectile points while digging his first test pit on the site.

Edward M. Green is a longtime serious avocational archaeological researcher. He first became interested in archaeology in the 1930's, when as a child he began hunting for arrowheads in Michigan. About 1960 that interest was renewed when he was invited to join an archaeology club where he met with Detroit students, college professors and collectors. He spent weekends with friends surface collecting, always keeping careful records.

R. Brown

Edward M. Green works the screendeck barge he helped design and build.

Ed helped organize numerous Paleo workshops for the River Raisin chapter of the Michigan Archaeological Society, flying in experts like Dennis Stanford and Vance Haynes.

In 1970 Ed became President of the Michigan Archaeological Society. He also served a number of years on the MAS Editorial Board. Before retiring to Florida, he was active in two society chapters and also served a term as President of the Aboriginal Research Club of Detroit. He has traveled to meetings and conventions all over the country.

Ed also has an interest in Mayan culture and has traveled to the Yucatan. He is most fascinated with the Mayan language. Mayans were the only culture of their time to have a phonetic written language. He continues to keep up on the latest literature and says the Mayan language is "a big mystery that is now being solved."

Ed is a graduate of Michigan State University with a B.A. in History. He also served in the U.S. Army's Counterintelligence Corps during the Korean conflict.

Ed is retired from Ford Motor Company and now lives in Springhill, Florida. He has been married to his wife, Lynn, for the past 41 years. They raised three children, two girls and a boy, and now have two grandchildren.

When not working on the ARPP, he officiates as president of the Hunters Lake Association, which he has done for the past five years. Ed also enjoys looking for great finds at flea markets and reading. He has a vast library of hard to find articles and books on archaeology and anthropology, particularly Paleoindian and Mayan studies. Ed keeps up to date on the latest literature and is always searching for new information.

Ed is famous for his delicate indian beadwork, one of the many passions that occupy his time. Each piece he creates takes several weeks, months, or sometimes years to complete and they are true masterpieces. Ed is an invaluable member of the Aucilla River Prehistory Project team. He spends months during the off season repairing and rebuilding the dredge screens and doing maintenance on equipment. To the screen crew, Ed is more than a valuable volunteer, he is our hero.

Off-season ARPP field activities

By John Davidson

Those of you familiar with the Aucilla River Prehistory Project are aware of the hard work put forth by dozens of staff and volunteers during our two major field seasons every spring and fall. What many people do not realize is that the success of a field season can be attributed to the advance work done by many dedicated individuals in the off season.

When the field season ends it is time to repair, maintain and modify the equipment in preparation for the next field season.

One off season project that made life a lot easier for the ARPP was the addition of a bay to the pole barn at Nutall Rise. The new bay was built in December 1995 by Ed Green, Jack Simpson, Joe Latvis and Bruce Allbritton. The bay provides ample space for the ARPP to store most of its equipment at Nutall Rise instead of hauling it across the state every season.

Another important activity accomplished in the off season is the preliminary surveying of potential sites. In March 1996, Andy Hemmings, Mark Muniz, Lance Carlson, David Webb, Bill Gifford, Joe Latvis and Jack Simpson braved the frigid waters of the Aucilla and Wacissa rivers. The purpose of this excursion was to collect Carbon-14 samples from the Sloth Hole site and to get a general assessment of the sites on Little River. The band of hardy adventurers also took a trip down the Wacissa river in search of possible sites.

Special thanks must go to Jody Barker and Jason Dees for the excellent work they did on the project's 20-foot pontoon barge during the summer hiatus. For those who remember it, one of the pontoons was flooded, and two air-filled plastic 55-gallon drums were needed to keep the vessel afloat during the spring '96 field season. Thanks to Alpha Welding's handiwork, the "Aucilla Queen" was river worthy for the October '96 season. Jody and Jason also refurbished the trailer and brought it back to better than new condition.

The most important activity that occurs during the off season is the maintenance, repair and modification of equipment essential to project operations. Much of this work has fallen on Gene Rowe and Ed Green. Gene has put a great deal of time and effort into the servicing of the many gas engines that are used by the ARPP. Likewise,. Ed has spent countless hours repairing other equipment such as snooper lights and screen decks. He

has also modified and fabricated several pieces of equipment to aid in the project's underwater activities. Ed and Gene deserve a big thank you and a pat on the back, because without their assistance the ARPP's operations would be severely hindered.

And last but not least special thanks should be given to Dawn Pinder, Bin Williams, Tim Barber, Bill Gifford, Joe Latvis and Jack Simpson. This small skeleton crew remained at Nutall Rise during and after Tropical Storm Josephine. They went back to Sloth Hole the day after the storm and collected the pontoon boats and equipment that was left behind, and transported it all back to Nutall Rise. During the two week delay cause by the storm, this crew was able to service and repair the gas engines, fix an oil leak on the jeep, repair the rear deck on Ed's boat and paint one of the little green boats. Then everything was packed and stored away.

So, just because the field season is over doesn't mean the work is done. There is plenty to do to get ready for the next field season. With the continued assistance of many dedicated and talented individuals, future field seasons will be successful.

World of experience

By Thadra Palmer

The following list of research projects participated in during 1996 by ARPP crew members illustrates the wealth of experience that this outstanding group of people brings from beyond the Aucilla:

ARPP MEMBER	SITE/SPONSOR	LOCATION	DESCRIPTION
Chip Birdsong	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Chip Birdsong	Little Salt Springs	Florida	Submerged Archaeological Site
Chip Birdsong	National Park Service	Great Smokey Mtns	Archaeological Site
Chip Birdsong	Marathon Keys	Florida	Shipwreck Survey
Rhonda Brewer	O'Connell Site	Tallahassee, FL	Spanish Mission
Rhonda Brewer	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Rhonda Brewer	Little Salt Springs	Florida	Submerged Archaeological Site
Brinnen Carter	Big Pine Tree	Allandale County, SC	11,000-6,000BP Archaeological Site
Brinnen Carter	Santa Elena	South Carolina	First Spanish Capital of La Florida
Brinnen Carter	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey
Diana Davis Coleman	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey
Peter Frank Edwards	O'Connell Site	Tallahassee, FL	Spanish Mission
Peter Frank Edwards	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Peter Frank Edwards	Little Salt Springs	Florida	Submerged Archaeological Site
Grayal Farr	O'Connell Site	Tallahassee, FL	Spanish Mission
Grayal Farr	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Grayal Farr	Little Salt Springs	Florida	Submerged Archaeological Site
Michael Faught	Fannin Springs Survey	Levy County, FL	Spring/Run Survey
Michael Faught	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey
Michael Faught	La Mula & Lake Alajuela	Panama	Paleoindian Site Visits/Tool Study
Bill Gifford	Blackwater Draw	Clovis, NM	Clovis Type Site
Bill Gifford	Fannin Springs Survey	Levy County, FL	Spring/Run Survey
Steve Glover	Blackwater Draw	Clovis, NM	Clovis Type Site
Andy Hemmings	Blackwater Draw	Clovis, NM	Clovis Type Site
Andy Hemmings	Fannin Springs Survey	Levy County, FL	Spring/Run Survey
Joan Herrera	Research Cruises	Offshore Florida	Marine Eco./Bio./Oceanography
Joan Herrera	USF & Fla. Inst. Oceanography	Offshore Tarpon Spgs, FL	Seagrass Beds & Echinoderms
Joe Latvis	Blackwater Draw	Clovis, NM	Clovis Type Site
Joe Latvis	Fannin Springs Survey	Levy County, FL	Spring/Run Survey
Joe Latvis	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey
Alyssa Martinelli	O'Connell Site	Tallahassee, FL	Spanish Mission
Billy May	Packfic Whale Fdn.	Maui, HI	Reef Survey
Billy May	NC State University	Bahamas	Nassau Grouper Study
Chuck Meide	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Chuck Meide	Little Salt Springs	Florida	Submerged Archaeological Site
Chuck Meide	La Salle's La Belle	Matagorda, TX	Shipwreck
Kimberly Monk	Point Pelee Nat'l Park	Leamington, Ontario	Shipwreck Surveys
Tammy Montes	O'Connell Site	Tallahassee, FL	Spanish Mission
Mark Muniz	Blackwater Draw	Clovis, NM	Clovis Type Site
Mark Muniz	Fannin Springs Survey	Levy County, FL	Spring/Run Survey
Mark Muniz	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey
Thadra Palmer	FSU Shipwreck	Loggerhead Key, FL	Shipwreck
Thadra Palmer	Little Salt Springs	Florida	Submerged Archaeological Site
Thadra Palmer	Marathon Keys	Florida	Shipwreck Survey
Tanya Peres	National Park Service	Cane River Nat. Hist. Park	Magnolia Plantation
Tanya Peres	O'Connell Site	Tallahassee, FL	Spanish Mission
Tanya Peres	FSU	Tallahassee, FL	Faunal Analysis (Bolen Level)
Eugene Rowe	Earthwatch	Yellowstone Nat'l Park	Wolf Health/Census
Eugene Rowe	Earthwatch	Rookery Bay, FL	Invasive Tropical Plants
Eugene Rowe	Earthwatch	Shenadoah Valley, VA	Deer Overpopulation Research
Eugene Rowe	Earthwatch	Eastern Shore of VA	Virginia Blue Crab Health
David Thulman	Bureau of Arch. Research	Bay County, FL	Shipwreck Survey

A Canadian volunteer's ARPP experience

By Kimberly Monk

So, how is it that a Canuck ended up on the ARPP? Well, I believe the bottom line came down to determination... and a very good, long distance phone plan! I must have talked with ten different organizations throughout the Southern USA before I reached Dr. David Webb at the Florida Museum of Natural History in Gainesville. I explained that I was interested in a career of Nautical Archeology, and I wished to gain some field experience in underwater excavation. I hesitated to mention that I was only an undergraduate entering first year anthropology with absolutely no training in archaeology whatsoever. Dr. Webb described a project which he was involved with, located in North Florida on the Aucilla River. He went on to explain that I would be able to receive underwater archaeology experience, without any previous formal training. My determination had paid off, and I had finally found field work. And better yet, I wouldn't have to mortgage the house in order to take part!

At this point in time, Canada unfortunately doesn't offer many opportunities to learn skills in underwater archaeology. Sure we have great shipwrecks, which are incredibly preserved due to the cold, freshwater lakes. However, shipwrecks are a time capsule, of some documentation. I believe the true detective work remains in such prehistoric sites as the Aucilla.

It's not every day that you stumble across mastodon bones, prehistoric fishhooks and fossilized alligator dung, or so I thought. Such was not the case on the Aucilla. For every day was a new adventure and a new find, as artifacts were constantly being found and studied. It was a wonderful experience to rotate assignments between the screendeck, divemaster and diving positions because you were able to see the project from a variety of different standpoints. Thanks to such a professional and knowledgeable crew, I learned more from my "Aucilla River Teachers" than from any history course which I had taken.

I returned to Toronto later that month with a wealth of stories and information to tell my Canadian friends. But more than just my friends, I wanted to share my experiences with the local diving community.

This led me to increase my involvement in an organization known as Save Ontario Shipwrecks. SOS is a non-profit volunteer organization with many local chapters across the province.

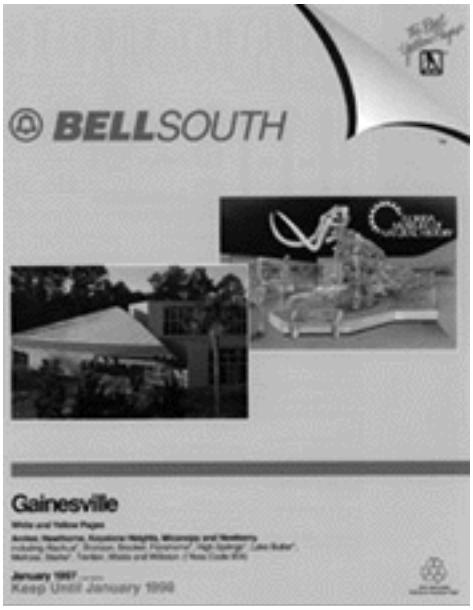
Along with public education and shipwreck research, the local chapter members undertake projects to promote the conservation efforts of SOS.

As the current Toronto chapter president, I appreciate the experience which I received on the ARPP as I attempt to guide the chapter in adopting projects of our own.

As a result of my experience with the Aucilla River Prehistory Project, I came to understand that all great volunteer projects are much like a recipe. It takes one part location, another part group activity, and the most important ingredient of all ... the special people who work together to make the project a success. It is these people whom I must thank for all the great memories, which I will never forget.

See y'all Americans at the rise in '97, eh?

Museum Grand Opening

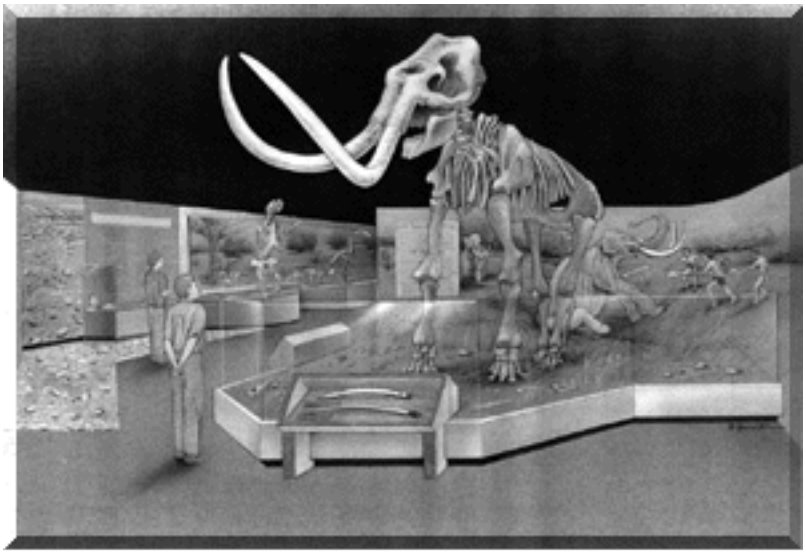


Front cover of Gainesville phone book featuringFLMNH's new Powell Hall and Aucilla River Displays.

POWELL HALL OPENS: NEW EXHIBITION AND EDUCATION BRANCH OF FLORIDA MUSEUM OF NATURAL HISTORY INAUGURATED ON UNIVERSITY OF FLORIDA CAMPUS

On February 21st, 1997 Powell Hall, the Museum's new Exhibition and Education Facility, was dedicated. In attendance were the Powell Brothers of West Palm Beach, Florida, University of Florida President and Mrs. John Lombardi, the Board of Regents, the local legislative delegation and numerous other supporters of the Florida Museum of Natural History. The first exhibition featuring Dinosaur Families, The Story of Egg Mountain runs from January 25th through April 27th. The new building is located in the southwestern comer of the UF campus, at 34th Street and Hull Road, accessible from Interstate 75 via the Archer Road exit. The phone number is (352) 846-2967. The museum's research and collection facilities continue to reside in Dickinson Hall near the center of the UF campus on Museum Road at Newell Drive.

Florida Hall of Fossils



FLMNH's new Florida Hall of Fossils featuring Aucilla River fossils and artifacts. Conceptual drawing by Barbara Harmon

The stellar focal point of the Pleistocene segment of this exciting new Powell Hall exhibit will be a 14-foot tall mammoth (Mammuthus columbi) skeleton. Articulation of this skeleton gleaned from the Aucilla River will provide drama and excitement to our story of Florida's first peoples who came from Asia with mammoth-hunting traditions. A fullscale diorama will encircle the skeleton depicting the hunt. The planned scenario includes a woman sitting at a campfire softening mammoth hide with a beamer made of a mammoth radius bone. The radius and other bone, stone and ivory tools are visible in a case nearby. Samples of early geometric art on ivory, as well as photographs of Eurasian paleolithic artwork will be displayed. A video of underwater recovery techniques used for the mammoth and Paleoindian discoveries made in connection with the Aucilla River Prehistory Project will be available for viewing. Pollen and plant records, mastodon stomach contents, gourd seeds, worked wooden stakes and charcoal evidence of human fire activity will help to tell our story of this age. An electronic map will designate major Paleoindian sites in Florida, all of which are now underwater because sea level has risen so dramatically in the last 12,000 years. In order to exit from the hall, visitors will pass under a long tusk arch, set on stacks of mammoth mandibles.

FLMNH Web site wins gold

On January 21, 1997, NetGuide selected the Florida Museum of Natural History's Web site as a Gold Site -- one of the best on the Web. The Gold Award recognizes Web sites that meet stringent criteria for overall excellence.

NetGuide screened over 100,000 URLs and their Gold Award goes to only 15,000 of the Web's best sites. That is why the museum now displays the Gold Award logo on its site.

The ARPP would like to recognize Dr. Wayne King, office of museum technology supervisor, and webmaster Dick Ruble on their success.

Visit NetGuide at

http://www.netguide.com

Office of Museum Technology
Florida Museum of Natural History
Gainesville, FL 32611
Tel. (352) 392-5132
Fax (352) 846-0287

Visit the ARPP Web site at:

http://www.flmnh.ufl.edu/natsci/vertpaleo/arpp.htm

Congratulations to Michael Nolan, John Turney, Stan Hord, Joan Herrera and Russ McCarty for formatting the *Aucilla River Times* onto our website.

Joan Herrera wins oceanography award

Joan Herrera, a veteran of many ARPP field seasons, is currently completing her Ph.D. Dissertation in Zoology at the University of Florida. Her doctoral research, which also calls upon her diving skills, investigates the *Diversity of Energetic Strategies Among Echinoid Larvae and the Transition from Feeding to Nonfeeding Development*. For her research, Joan received, from the Florida Institute of Oceanography, the Vice Admiral William W. Behrens, Jr. Award. This award was presented by Dr. Carl Luer from the Mote Marine Lab in Sarasota, as announced in the *Florida Scientist* (vol. 59, p. 140, 1996).

Paleofest96

S. Blomeley

FLMNH Curator Dr. Bruce MacFadden with Leisey Equus horse skeleton

On the weekend of November 8th and 9th, the Florida Museum of Natural History (FLMNH) on the University of Florida campus in Gainesville held Paleofest96, a festival celebrating Florida Paleontology. It was our first attempt at such a venture, and fortunately the success of this event exceeded our most optimistic expectations.

Over 350 registrants participated in this two-day event, which was organized by FLMNH staff Marc Frank, Douglas Jones, Bruce MacFadden, Carol Pooser, Roger Portell and co-sponsored by the FLMNH, The Paleontological Society and Florida Paleontological Society. Over 75 volunteers, including many UF students and the FLMNH Museum Associates, worked very hard and thereby ensured the overall success of this event. Paleofest96 activities included a Friday night reception social and dedication of the Florida 40 Million Years Ago exhibit and Leisey Equus horse skeleton (see photo). Saturday's events included 32 workshops, mostly on Florida fossils, special displays by many of the states fossil clubs and related organizations, a fund-raising happy-hour and auction, and book-signing and public lecture entitled "Discovering Dinosaurs" by noted dinosaur paleontologist and author (of Lone Star Dinosaurs and Quest for African Dinosaurs) Dr. Louis L. Jacobs III, geology professor and museum director at Southern Methodist University in Dallas, TX. In addition to the Paleofest96 registrants, another 300 children and adults from the surrounding community attended the Saturday evening dinosaur lecture.

On many fronts, Paleofest96 was a resounding success: It brought together Florida paleofolks, allowed us to introduce the FLMNH to many first-time visitors, provided community visibility for our museum's programs, allowed a fun learning environment, and, last but certainly not least, the net proceeds from Paleofest96 totaled 13,500, which will be used to support the paleontological activities and educational programs here at the FLMNH. Many of those in attendance are supporters of the Pony Express program, and we sincerely thank you for attending the event. We hope that Paleofest96 allowed you an additional opportunity to enjoy Florida fossils (including horses, of course) and to make new paleofriends.

Robin Brown receives 1996 Converse Award

FLMNH Curator Dr. Bruce MacFadden presents Converse Award to celebrated author of "*Florida's First People*" (and longstanding ARPP enthusiast) Dr. Robin Brown.

Dr. Robin Brown, Pony Express Charter Member, long-standing ARPP enthusiast, paleontologist, and author extraordinaire, was presented with this year's Howard Converse Award. Dr. Bruce McFadden presented the award to Robin during the Saturday morning session at Paleofest96. Robin is recognized for his strong support of the museum and his numerous specimen donations. His most outstanding contribution is, of course, his famous book on Florida's fossils, which is in its second edition and fourth printing, with over 10,000 copies sold.

The Converse Award is presented yearly to recognize an individual from the non-professional paleonotological ranks who has made outstanding contributions to Florida paleontology. The award is named in honor of Howard Converse, former preparator at the museum. Award recipients are selected by the museum paleontology staff and are presented with a personalized wall plaque. Their names are also inscribed on a large permanent plaque which hangs in the museum.

Letters To The Editor

Pioneer Ohmes applauds
Sloth Hole research

The assurance that Sloth Hole will at last receive the thorough scientific study it deserves is to me inexpressibly gratifying. Perhaps I'm unduly optimistic but I believe that it, and perhaps the entire West Run, may in the end prove of greater archaeological significance than the fantastic river it nourishes. The prodigious concentration of ivory must be the clue to something unique about that location. May you solve that mystery.

Your telephone call set me a'dither at the prospect of meeting you and the divers who will be doing the work, (How wonderful it would have been for Don and me back in the '60s had such an opportunity existed!). But alas, it's not to be. Circumstances here prevent any prolonged absence of more than a day or two.

My hope is that someone in your crew does videos, or photos.

Many thanks again.

Sincerely,
Dick Ohmes
Bremerton, WA
P.S. This dog lover was touched by
your requiem for Miss Fossil.

Blackwater Draw site thanks ARPP

J. Dickenson

Middle-Archaic aged double-barbed point from Blackwater Draw.

The status of Blackwater Draw Site is good if you look at the positive side. I finished the excavation of the trenches for the foundation (of a building designed to shelter excavations from the elements and permit visitors to observe the excavation in progress) on November 25th. The stratigraphic profiles were completed by December 16th, and I am trying to finish the stabilization of the arroyo and secure the fabric (which prevents site erosion) for the final time.

Of the 1,160 artifacts recorded this year in our trenches 500 are lithics. Burned bone and caliche make up a fourth of that number. (I haven't counted the actual figures yet.) The large bone beds were on the lower slopes. Very small fragments came from the screen of the upper level trenches, and half were burned to a blue color. Flakes number around 350 yet to analyze. Four utility tan pottery pieces and 5 fragments of projectile points were found in the tan sand on an old washed surface between the weak soil development and tan sand that covered the top of the lake. One middle-Archaic age point is different from the rest. A photo is included. The whole point has two barbs on each lateral side. The raw material is gray chert. More closeups will be taken as soon as I get a number on it.

The group of people evidently were collectors also. In that same level a midsection of an Eden, a base of a Plainview and two tips of large bifacial points (one Paleoindian) were found among the burned and caliche pebbles. They were not in rodent burrows either.

Now to the construction of the building. hope to let the bid for construction by February 1st.) Completion date has been pushed back to Memorial Day.

Thank you Dr. Webb for supporting your (Aucilla River Prehistory Project) workers while they do volunteer work. (Mark Muniz, Andy Hemmings, Bill Gifford, Steve Glover and Joe Latvis) were such a help to me, and we appreciate people like you. You will have to come and let me show you the Site sometime.

Thanks too for the casts sent of the points.

Warmest regards,

Joanne Dickenson, Curator
Blackwater Draw Site
Eastern New Mexico University
608 New Mexico 467
Portales, New Mexico 88130

Legislative Advocacy Campaigns

The Special Category Grant Funding process administered by the Florida Department of State, Division of Historical Resources, occasions legislative advocacy campaigns to Tallahassee twice each year in support of the funding package that contains the ARPP proposal.

Office of Secretary of State

ARPP principals (l to r): Joseph Latvis, Dr. S. David Webb and Jack Simpson present Secretary of State Sandra Mortham with display of Aucilla River artifact replicas.

Aucilla River Prehistory Project staff and volunteers from around the state converge on the offices of the Governor, Secretary of State, Senate and House of Representatives, presenting their case with the skill, experience and enthusiasm that so many team members possess.

Hailing from project host institution FLMNH, Project Director Webb and Co-chief Scientist Milanich are the point men in this process, their eloquent efforts augmented by a host of dedicated partisans: In 1996, Jody Barker and Dean Sligh voiced Orange County's support; Wilmer Bassett, David Janet and Jack Simpson represented Jefferson County's interests; Lance Carlson and Matthew Mihlbachler communicated UF undergraduate support; Brinnen and Jennifer Carter and David Thulman articulated Leon County's preferences; Bill Gifford and Steve Glover delivered Volusia County's perspective; Ed Green and Joe Latvis advocated Hernando County's priorities; Andy Hemmings and Mark Muniz reflected UF graduate student sentiment; and Alyssa Martinelli and Tanya Peres vouched for FSU's graduate student interests.

In addition to the enthusiastic support we have come to enjoy from perennial boosters like Governor Lawton Chiles, Secretary of State Sandra Mortham, and Representatives Allen Boyd and Marjorie Tumbull, we also received substantial encouragement from Senators W.D. Childers, Charles Bronson and Rick Dantzler, as well as Representatives Buzz Ritchie, Alzo Reddick, Shirley Brown and Cynthia Chestnut.

Transcending party affiliation, all agree that the world class research and extensive public outreach conducted by the Aucilla River Prehistory Project is an enlightened investment of public funds that will pay dividends for generations to come.

Soliciting letters of support for '97

Your letters made the difference last year (see below). This year we need them even more urgently. These letters will allow us to maintain our momentum on the river excavations, and they will allow our graduate students to continue their research programs.

Please, if you enjoyed this new magazine and the exciting prehistoric research it represents, write us a letter. Please sit down and do it now. Any letter in your own words about what intrigues or appeals to you about the ARPP will be just fine. You could mention that you would like to see the ARPP continue its recovery of this unique part of our Florida Heritage.

To be part of our application for a grant, we ask that you address your letter to: **Mr. George Percy, Special Category Grants, Division of Historical Resources, Department of State**, but mail your letter to:

Dr. S. David Webb
FLMNH
University of Florida
Gainesville, FL 32611-7800

That is because I must compile these letters in a particular format and then bundle them all as an appendix in support of the grant.

Thanks for writing and sending your letter to me at this museum address before May, 1997.

1996 funding support letter appreciation

We are deeply indebted to friends of the ARPP who wrote letters to the granting agency within the Department of State in support of our project. There were 43 such letters from a wonderful range of supporters. Most letters naturally were generated by residents of the state of Florida, but there were also six excellent epistles from neighboring states, western regions and even Canada. Nothing reaches the hearts of our review board members more than these letters. That is why we thank you most sincerely. That is also why we solicit and even greater wave of support this spring for our future funding.

Gift Options

Boating, scuba diving, archaeology and camping are all equipment intensive activities. The science of remote-site underwater archaeology, requiring a synthesis of all these disciplines, is of necessity extremely "gear" intensive. The Aucilla River Prehistory Project has survived since its inaugural year of 1983 solely because volunteers have contributed not only their considerable talent, but also their expensive personal equipment as well.

While we salute the many individuals, institutions and organizations for their generous support, we believe that if we are to continue exploring these world-class archaeological sites safely, professionally, and efficiently, the ARPP must itself acquire the equipment and services necessary to accomplish its missions.

In the course of preparing funding request documents, we have designated the project's long term objectives. Fulfilling these objectives requires specialized equipment and a variety of services.

While we have proposed substantial requests to a number of private, state and federal agencies, we also count on your continued support by private donations.

If you wish to help our multidisciplinary team of professionals and volunteers accomplish any of these objectives, we will be deeply indebted. Listed below are some key goals. Donations in any amount or form are administered through the University of Florida Foundation, and are tax deductible to the limits of the law. Please contact:

Dr. S. David Webb
FLMNH
University of Florida
Gainesville, FL 32611-7800

Suggested Gifts

Need: To upgrade Aucilla River site data recording.
Item: CAD-CAM software
Cost: $500

Need: To mail Aucilla River Times.
Item: Bulk mailing and labeling
Cost: $250

Need: Diver's safety recall device
Cost: $600

Need: To excavate tough clays on river bottom.
Item: Six Marshalltown trowels
Cost: $50

Need: Direct date on rare bone artifact.
Item: Carbon date on bone apatite
Cost: $1100 at Boulder, CO, lab

Need: Modern oxygen delivery system
Item: DAN oxygen first-aid kit
Cost: $400

Donor Acknowledgment

The Aucilla River Prehistory Project gratefully acknowledges support by the State of Florida Division of Historical Resources, Florida Department of State, Tallahassee, Florida. During 1996 ARPP received its second major grant for its archaeological research on First Floridians and Last Megafauna.

The ARPP also received major funding from National Geographic Society, Committee on Research and Exploration. Neither of these funding organizations was liable for injury or property damage that might have resulted from ARPP activities. Nor are they responsible for opinions or interpretations derived from the archaeological and paleontological research conducted under these grants.

The Aucilla River Prehistory Project also acknowledges vital support from several dozen volunteer scuba divers from Florida and beyond, who freely dedicate their time, energies and personal dive gear to participate in this important research. The University of Florida also provides fundamental offices, labs, collections, equipment, vehicles and personnel to carry forward this project. We especially thank the Ladson family for their continuing hospitality, encouragement and support of this project's activities on their land. Finally we are deeply indebted to many individual friends of the project who have contributed both emotional energy and material gifts to its success. We offer our heartfelt thanks to the following list of private and corporate boosters.

Sustaining Boosters $5,000-24,999	**Contributing Boosters $100-999**	**Boosters $10-99**
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M.C. David	J.R. Walker (for J.R.'s Aucilla River Store)	Mark T. Sanders
Bill Gifford	Bill Wright (for Perry Pepsi Cola)	Bin Williams
Steve and Jane Glover	c	c

Down by the old mill stream

By Phillip M. Pollock

In the proudest of Florida gastronomic traditions, more than 50 field crew members in 1996 on more than one occasion celebrated a breakfast at Nutall Rise main camp consisting of delicious pancakes made from a batter mix of Old Sugar Mill's finest stone ground grains (generously donated by Patty Schwarze).

An old sugar mill is nestled alongside DeLeon Springs in western Volusia County. Although the spring has been spilling millions of gallons of water into Spring Garden Creek for as long as anyone can remember, the mill wheel itself, once powered by the water's immense force, is now silent. A gray and cracked matrix of spokes and paddles rests motionless.

Now a family of sixth-generation gristmillers own the mill -- it is a restaurant whose specialty is pancakes that you can grill yourself on griddles in the center of rectangular tables. Guests ladle out batter made of grain that is stone-ground on the site and then let their senses direct when the meal is ready.

The atmosphere at the mill is rustic. Inside, old tin syrup containers, wooden tools and grinding apparatus displayed along the walls add visual flavor to meals. Outside, beyond the wooden frame of the mill, ruddy-colored brick is still visible from more prosperous milling days.

Stone tool and pottery remains indicate that as far back as 6,500 years ago, humans found the area a desirable location for many activities. Further evidence of occupation does not appear until the late 1700s when historical accounts reflect Creek and Seminole Indian settlement. By 1832, the spring was part of a large sugar cane plantation owned by Colonel Orlando Rees.

With the assistance of a Scottish engineer, Rees built a mill along the spring's outflow to extract sugar from the large cane stalks. Four years later, the mill was destroyed during the Second Seminole War. A wealthy slaveholder, Thomas Starke, later traded fifty slaves for the property rights to the mill site and rebuilt it in 1840. Starke utilized the

mill through the start of the Civil War, then aided the Confederacy and became a target for retaliation by Union forces -- the mill was disabled in the latter period of the war.

Most of the wooden structure of the mill that exists today dates to 1878; however, only the metal hub for the wooden wheel remains from the original mill construction in 1832. Inviting smells of country cooking that drift outside remind visitors that both the mill and springs possess a unique, shared history.

This article from Florida Heritage *magazine reprinted courtesy of Florida Department of State, Division of Historical Resources.*

Aucilla

Who was that exotic, mysterious new divemaster during the Spring '96 field campaign?

About the Aucilla River Times

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- **Graphical Layout: Joe Ciaramella**
- **Consultant: Kristin Herzog**
- **Website Formatting: Joan Herrera**

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Cover Art

- **"The Past Made Present" by Ken Kirkpatrick**

The *Aucilla River Times* is published on an annual basis to update a readership interested in the status of the Aucilla River Prehistory Project. This ongoing archaeological/paleontological research is sponsored by the Florida Musuem of Natural History. This newsletter is published by the project management based at:

The Florida Museum of Natural History
Attention: Dr. S. David Webb
University of Florida
Gainesville, Florida 32611-7800

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Aucilla River Times

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Please review the Gift Options article. You may send a gift of any size toward the purchase of particular equipment or services, or it may be unrestricted. Thanks for your continuing consideration and support.

For your subscription send your NAME and ADDRESS to:

Dr. S. David Webb
Department of Vertebrate Paleontology
Florida Museum of Natural History
University of Florida Gainesville, Florida 32611-7800

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