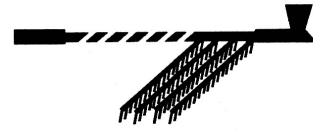


CALUMET



Newsletter of the Indian Peaks Chapter of the Colorado Archaeological Society
March, 2012

CALENDAR OF EVENTS

Presentation (lecture) meetings are held in the University of Colorado Museum, Dinosaur Room on the Second Thursday of most Months, at 7:00 PM. **The public is always welcome.**

Web Site: WWW.INDIANPEAKSARCHAEOLOGY.ORG

March 7

AIA – Boulder Chapter, 7PM, Paleontology Hall, CU Museum, Tyler Lansford
Description: Built in 55 BC, the Theater of Pompey was not only the first permanent theater in the city of Rome but also a monument to the glory of its builder – Julius Caesar’s bitterest rival, Pompey the Great. In a time of political and social unrest, the construction of a building in which thousands of people could assemble was controversial: Pompey thwarted resistance to the idea by locating his theater on private property and by crowning it with a temple so as to suggest that the monument was of a fundamentally religious character. With a seating capacity of 11,000, it remained a dominant feature of Rome’s urban landscape for at least six centuries. In this illustrated lecture, Professor Lansford will explore the architecture of the building, its role in the projection of Pompey’s public image, and its ultimate fate in the medieval and modern periods. Presenter: Dr. Tyler Lansford (CU)

March 8

IPCAS Presentation Meeting, 7PM, Steve Lekson. Topic: Yellow Jacket - the Largest Mesa Verde Town. The University of Colorado has a long history of research at the Yellow Jacket site, the largest Mesa Verde site, located about 20 miles northwest of Mesa Verde National Park. Joe Ben Wheat's excavations from 1954 to 1991, more recent analysis of Wheat's collections, and now a new project looking at Basketmaker III at Yellow Jacket complement excavations by Crow Canyon Archaeological Center in the early 1990s. This program will review research at Yellow Jacket, discuss on-going research, and suggest possible future projects with IPCAS members.

March 18

AIA – Denver Chapter, 7PM, Tattered Cover Bookstore in LODO, Dr. Sinclair Bell
Fans, Fame and the Roman Circus

In the first century CE, the funeral for Felix, a charioteer of the Red team, made headlines in the *acta diurna*—so Pliny reports—when one of his fans immolated himself on his favorite’s funeral pyre. While an extreme example, fan behavior in ancient Rome is not unknown. Yet where charioteers assumed a highly-visible presence in Roman society and have been much studied, the fans whom they inspired remain largely overlooked and poorly understood. This paper draws upon a wide range of literary, artistic and archaeological evidence in reconstructing and reclaiming the interactive experience of the sport’s various kinds of followers. The evidence of material culture—including funerary monuments, game boards and smaller articles (fingerings, game tokens)—is shown to have particular value in offsetting the largely hostile view of fans that emerges from the literary record. Contemporary perspectives drawn from the sociology of sport are also brought to bear. The central aim of the paper is to demonstrate how the study of the sports fan, who sat at the fault line between staged spectacles and everyday life, can enlighten us in new ways about the centrality of the Circus to Roman culture.

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Sinclair Bell is with the School of Art at Northern Illinois University, and holds his degrees from the

University of Edinburgh and the University of Cologne, Oxford University, and Wake Forest University. His areas of specialization are Etruscan and Roman Art and Archaeology, sport and spectacle in the ancient world, and materials culture studies. His most current publication (in preparation) is “The Roman Circus: A Cultural History”, and he is the recipient of a DAI/AIA Study in Berlin Fellowship. For details see www.aiadenver.org

March 22-24 2012 34th Annual Colorado Council of Professional Archaeologists Conference
Durango Colorado, hosted by ERO Resources Corporation at the Historic Strater Hotel.
Special rates for CAS members. For details: www.coloradoarchaeologists.org

March 22 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa
Drive, Boulder, CO 80305), Topic: Mammoths and mammoth hunters

April 1 Discussion, Tattered Cover Bookstore in LODO, 2PM, Dr. Brian Billman,
Topic: Saving the Past by Investing in the Future: Archaeological Preservation on the North
Coast of Peru Through Community Action
Peru is one of the richest archaeological regions in the world. Despite the importance of these
ancient sites and the wealth generated through tourism, the archaeological heritage of Peru is
being destroyed at an unprecedented rate. Dr. Billman will discuss how MOCHE, Inc., a
nonprofit organization, is working to protect the 10 most endangered archaeological sites on the
north coast of Peru within the next five years.
Dr. Billman writes: To solve the intertwined problems of looting, poverty, and lack of heritage
education, we form partnerships with poor communities in Peru. We provide communities with
heritage education programs and funding for development projects, such as schools, health
clinics, potable water and sewage treatment systems, roads, and parks. In exchange for our
assistance, communities agree to create and defend archaeological reserves. We fund these
community partnerships by offering archaeological tours, field schools, and volunteer programs
in Peru. Through these programs we unite communities in Peru with socially committed people
in the US. In our view, the best way to save archaeological sites is by investing in the future of
communities. Dr. Billman is Associate Professor, University of North Carolina-Chapel Hill
President and co-founder MOCHE, Inc. For details see www.aiadenver.org

April 18-22 2012 Society for American Archaeology 77th Annual Meeting
Memphis Tennessee, for meeting and registration information go to
<http://www.saa.org/AbouttheSociety/AnnualMeeting/tabid/138/Default.aspx>

April 19 IPCAS Presentation Meeting, 7PM, TBA
(note change to 3rd Thursday)

May 10 IPCAS Presentation Meeting, 7PM, Kolleen Kralick,
Topic: The Cherokee Trail

May 24 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa
Drive, Boulder, CO 80305), Topic: Yellow Jacket Pueblo, Colorado

June 5-29 2012 FIELD SCHOOL: Field Methods in Rock Art hosted by SHUMLA School
Registration deadline is May 14, 2012
Are you a looking for an amazing field school opportunity?
Every summer SHUMLA offers its Field Methods in Rock Art field school course.
Enroll to spend four intense weeks exploring desert canyons and recording world-class rock art while earning three graduate or six undergraduate college credit hours through Texas State University.

You will learn:

How to establish a field research design and data collection protocols

Current theories regarding the meaning and function of rock art

Rock art recording methods, laboratory procedures, and data analysis

The archeology of the Lower Pecos, hunter-gatherer lifeways, and foraging adaptation

For information visit the SHUMLA website <http://www.SHUMLA.org>, or call (432) 292-4847.

July 12 Treks From History Colorado. Visiting Camp Amache,
Thursday July 12 5PM to Friday July 13 2:30PM
On this trek, we'll head to the eastern plains for a visit to camp Amache, a world War II Japanese-American internment camp. We'll watch archaeological excavations and hear from researchers making new discoveries. This is a rare opportunity, considering fieldwork at Camp Amache only occurs for a few weeks every other year. We'll see camp artifacts, building foundations and also visit the Amache Museum. \$90 Colorado Historical Society members, \$115 non members (single supplement \$50). Price includes lodging in lamar, three meals and museum entrance fees. Contact the Colorado Historical Society for more information and to sign up.
<http://www.historycolorado.org/>

July 26 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa Drive, Boulder, CO 80305), Topic: Influences of High Plains Native American cultures

September 27 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa Drive, Boulder, CO 80305), Topic: Mimbres pottery

September 28 Treks From History Colorado, Four Corners Archaeology Trek
Friday, September 28 5PM to Monday Oct 1 10AM
On this off-the-beaten path trek, State Archaeologist Richard Wilshusen and Assistant State Archaeologist Kevin Black will introduce us to the natural beauty of southwestern Colorado as we discover seldom-seen archaeological sites of the Four Corners Region. We'll explore ruins in both the Canyons of the Ancients and Hovenweep National Monuments, as well as lesser-known sites on public lands. We'll also check out towers, kivas, rock art, and some of the last occupied Puebloan sites in the Mesa Verde area. \$350 Colorado Historical Society members, \$425 non members (single supplement \$75). Price includes lodging, six meals and site entrance fees. Contact the Colorado historical society for more information and to sign up.
<http://www.historycolorado.org/>

November 15 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa Drive, Boulder, CO 80305), Topic: Neanderthals

January 24 Reading and Discussion Group, 7PM, Reynolds
Library Meeting Room (3595 Table Mesa Drive, Boulder, CO 80305), Topic: Folsom sites and people

Membership Renewal 2012 – Indian Peaks Chapter, CAS

It's time to renew your membership to the Indian Peaks Chapter of the Colorado Archaeological Society! Please print out the attached form and mail your check to the address on the form.

This past year we hosted the Colorado Archaeological Society Annual meeting, sponsored many wonderful speakers on a wide variety of archaeological topics, offered a PAAC class, sent out our newsletter, started a reading and discussion group and went on some great field trips. We hope you will join us in 2012.

Thanks everyone for your past support!

IPCAS renewal	Individual	Family	Student
January – December 2012	\$28.50	\$33.00	\$14.00

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Tax-Exempt Donation ___ \$10, ___ \$25, ___ \$50, Other _____

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CODE OF ETHICS

As a member of the Colorado Archaeological Society, I pledge: To uphold state and federal antiquities laws. To support policies and educational programs designed to protect our cultural heritage and our state's antiquities. To encourage protection and discourage exploitation of archaeological resources. To encourage the study and recording of Colorado's archaeology and cultural history. To take an active part by participating in field and laboratory work for the purpose of developing new and significant information about the past. To respect the property rights of landowners. To assist whenever possible in locating, mapping and recording archaeological sites within Colorado, using State Site Survey forms. To respect the dignity of peoples whose cultural histories and spiritual practices are the subject of any investigation. To support only scientifically conducted activities and never participate in conduct involving dishonesty, deceit or misrepresentation about archaeological matters. To report vandalism. To remember that cultural resources are non-renewable and do not belong to you or me, but are ours to respect, to study and to enjoy.

Signature: _____

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Earliest Humans Not So Different from Us, Research Suggests

ScienceDaily (Feb. 15, 2011) — That human evolution follows a progressive trajectory is one of the most deeply entrenched assumptions about our species. This assumption is often expressed in popular media by showing cavemen speaking in grunts and monosyllables (the Geico Cavemen being a notable exception). But is this assumption correct? Were the earliest humans significantly different from us?

In a paper published in the latest issue of *Current Anthropology*, archaeologist John Shea (Stony Brook University) shows they were not.



Stone points dating to at least 104,000 years ago from Omo Kibish, Ethiopia.

These points, shaped by pressure-flaking and likely used as projectile points are more than 65,000 years older than the oldest similar artifacts from the European Upper Paleolithic Period. The Omo Kibish toolmakers showed equal skill at making similar points out of very different kinds of stone. (John Shea, Stony Brook University)

The problem, Shea argues, is that archaeologists have been focusing on the wrong measurement of early human behavior. Archaeologists have been searching for evidence of "behavioral modernity," a quality supposedly unique to *Homo sapiens*, when they ought to have been investigating "behavioral variability," a quantitative dimension to the behavior of all living things.

Human origins research began in Europe, and the European Upper Paleolithic archaeological record has long been the standard against which the behavior of earlier and non-European humans is compared. During the Upper Paleolithic (45,000-12,000 years ago), *Homo sapiens* fossils first appear in Europe together with complex stone tool technology, carved bone tools, complex projectile weapons, advanced techniques for using fire, cave art, beads and other personal adornments. Similar behaviors are either universal or very nearly so among recent humans, and thus, archaeologists cite evidence for these behaviors as proof of human behavioral modernity.

Yet, the oldest *Homo sapiens* fossils occur between 100,000-200,000 years ago in Africa and southern Asia and in contexts lacking clear and consistent evidence for such behavioral modernity. For decades anthropologists contrasted these earlier "archaic" African and Asian humans with their "behaviorally-modern" Upper Paleolithic counterparts, explaining the differences between them in terms of a single "Human Revolution" that fundamentally changed human biology and behavior. Archaeologists disagree about the causes, timing, pace, and characteristics of this revolution, but there is a consensus that the behavior of the earliest *Homo sapiens* was significantly that that of more-recent "modern" humans.

Shea tested the hypothesis that there were differences in behavioral variability between earlier and later *Homo sapiens* using stone tool evidence dating to between 250,000- 6000 years ago in eastern Africa. This region features the longest continuous archaeological record of *Homo sapiens* behavior. A systematic comparison of variability in stone tool making strategies over the last quarter-million years shows no single behavioral revolution in our species' evolutionary history. Instead, the evidence shows wide variability in *Homo sapiens* toolmaking strategies from the earliest times onwards. Particular changes in stone tool technology can be explained in terms of the varying costs and benefits of different toolmaking strategies, such as greater needs for

cutting edge or more efficiently-transportable and functionally-versatile tools. One does not need to invoke a "human revolution" to account for these changes, they are explicable in terms of well-understood principles of behavioral ecology.

This study has important implications for archaeological research on human origins. Shea argues that comparing the behavior of our most ancient ancestors to Upper Paleolithic Europeans holistically and ranking them in terms of their "behavioral modernity" is a waste of time. There are no such things as modern humans, Shea argues, just *Homo sapiens* populations with a wide range of behavioral variability. Whether this range is significantly different from that of earlier and other hominin species remains to be discovered. However, the best way to advance our understanding of human behavior is by researching the sources of behavioral variability in particular adaptive strategies.

Modern Behavior of Early Humans Found Half-Million Years Earlier Than Previously Thought

ScienceDaily (Dec. 23, 2009) — Evidence of sophisticated, human behavior has been discovered by Hebrew University of Jerusalem researchers as early as 750,000 years ago -- some half a million years earlier than has previously been estimated by archaeologists.

The discovery was made in the course of excavations at the prehistoric Gesher Benot Ya'aqov site, located along the Dead Sea rift in the southern Hula Valley of northern Israel, by a team from the Hebrew University Institute of Archaeology. Analysis of the spatial distribution of the findings there reveals a pattern of specific areas in which various activities were carried out. This kind of designation indicates a formalized conceptualization of living space, requiring social organization and communication between group members. Such organizational skills are thought to be unique to modern humans.

Attempts until now to trace the origins of such behavior at various prehistoric sites in the world have concentrated on spatial analyses of Middle Paleolithic sites, where activity areas, particularly those associated with hearths, have been found dating back only to some 250,000 years ago.

The new Hebrew University study, a report on which was recently published in the journal *Science*, describes an Acheulian (an early stone tools culture) layer at Gesher Benot Ya'aqov that has been dated to about 750,000 years ago. The evidence found there consists of numerous stone tools, animal bones and a rich collection of botanical remains.

Analyses of the spatial distribution of all these finds revealed two activity areas in the layer: the first area is characterized by abundant evidence of flint tool manufacturing. A high density of fish remains in this area also suggests that the processing and consumption of many fish were carried out in this area -- one of the earliest evidences for fish consumption by prehistoric people anywhere.

In the second area, identified evidence indicates a greater variation of activities -- all of which took place in the vicinity of a hearth. The many wood pieces found in this area were used as fuel for the fire. Processing of basalt and limestone was spatially restricted to the hearth area, where activities indicate the use of large stone tools such as hand axes, chopping tools, scrapers, and awls. The presence of stone hammers, and in particular of pitted anvils (used as nutting stones), suggest that nut processing was carried out near the hearth and may have involved the use of nut roasting. In addition, fish and crabs were probably consumed near the hearth.

The Gesher Benot Ya'aqov excavations were carried out under the direction of Prof., Naama Goren-Inbar. The research collaborators are Dr. Ella Werker, Dr. Nira Alpersón-Afil, Dr. Gonen Sharon, Dr. Rivka Rabinovich, Dr. Shosh Ashkenazi, Dr. Irit Zohar and Rebecca Biton of the Hebrew University Institute of Archaeology. Prof. Mordechai Kislev and Dr. Yoel Melamed of Bar Ilan University, Dr. Gideon Hartman of the Max Planck Institute and Prof. Craig Feibel of Rutgers University.

Oldest Man Made Structure Found in Greek Cave

Analysis by [Rossella Lorenzi](#)

Apr 5, 2010

The oldest known example of a man-made structure was found within a prehistoric cave in central Greece, according to the Greek culture ministry. The structure is a stone wall that blocked two-thirds of the entrance to the Theopetra cave near Kalambaka on the north edge of the Thessalian plain. It was constructed 23,000 years ago, probably as a barrier to cold winds.

"An optical dating test, known as Optically Stimulated Luminescence, was applied on quartz grains nested within the stones. We dated four different samples from the sediment and soil materials, and all provided identical dates," Nikolaos Zacharias, director of the laboratory of archaeometry at the University of Peloponnese, told Discovery News.

According to a statement by the ministry of culture, "the dating matches the coldest period of the most recent ice age, indicating that the cavern's inhabitants built the stone wall to protect themselves from the cold." Excavated since 1987, the Theopetra cave is well known to paleontologists as it was used and inhabited continuously from the Paleolithic period onwards (50,000 to 5,000 years ago).

"The newly discovered stone structure is important as it shows the technological level of humans at that time," Zacharias said.

Oldest Evidence of Stone Tool Use and Meat-Eating Among Human Ancestors Discovered: Lucy's Species Butchered Meat

ScienceDaily (Aug. 11, 2010) — The evolutionary stories of the Swiss Army Knife and the Big Mac just got a lot longer. An international team of scientists led by Dr. Zeresenay Alemseged from the California Academy of Sciences has discovered evidence that human ancestors were using stone tools and consuming meat from large mammals nearly a million years earlier than previously documented. While working in the Afar Region of Ethiopia, Alemseged's "Dikika Research Project" team found fossilized bones bearing unambiguous evidence of stone tool use -- cut marks inflicted while carving meat off the bone and percussion marks created while breaking the bones open to extract marrow.

The bones date to roughly 3.4 million years ago and provide the first evidence that Lucy's species, *Australopithecus afarensis*, used stone tools and consumed meat. The research is reported in the August 12 issue of the journal *Nature*.

"This discovery dramatically shifts the known timeframe of a game-changing behavior for our ancestors," says Alemseged, Curator of Anthropology at the California Academy of Sciences. "Tool use fundamentally altered the way our early ancestors interacted with nature, allowing them to eat new types of food and exploit new territories. It also led to tool making -- a critical step in our evolutionary path that eventually enabled such advanced technologies as airplanes, MRI machines, and iPhones."

Although the butchered bones may not look like particularly noteworthy fossils to the lay person, Alemseged can hardly contain his excitement when he describes them. "This find will definitely force us to revise our text books on human evolution, since it pushes the evidence for tool use and meat eating in our family back by nearly a million years," he explains. "These developments had a huge impact on the story of humanity."

Until now, the oldest known evidence of butchering with stone tools came from Bouri, Ethiopia, where several cut-marked bones were dated to about 2.5 million years ago. The oldest known stone tools, dated to around the same time, were found at nearby Gona, Ethiopia. Although no hominin fossils were found in direct association with the Gona tools or the Bouri bones, an upper jaw from an early Homo species dated to about 2.4 million years ago was found at nearby Hadar, and most paleoanthropologists believe the tools were made and used only by members of the genus Homo.

The new stone-tool-marked fossil animal bones from Dikika have been dated to approximately 3.4 million years ago and were found just 200 meters away from the site where Alemseged's team discovered "Selam" in 2000. Dubbed "Lucy's Daughter" by the international press, Selam was a young *Australopithecus afarensis* girl who lived about 3.3 million years ago and represents the most complete skeleton of a human ancestor discovered to date.

"After a decade of studying Selam's remains and searching for additional clues about her life, we can now add a significant new detail to her story," Alemseged notes. "In light of these new finds, it is very likely that Selam carried stone flakes and helped members of her family as they butchered animal remains."

The location and age of the butchered bones from Dikika clearly indicate that a member of the *A. afarensis* species inflicted the cut marks, since no other hominin lived in this part of Africa at this time. These fossils provide the first direct evidence that this species, which includes such famous individuals as Lucy and Selam, used stone tools.

"Now, when we imagine Lucy walking around the east African landscape looking for food, we can for the first time imagine her with a stone tool in hand and looking for meat," says Dr. Shannon McPherron, archeologist with the Dikika Research Project and research scientist at the Max Planck Institute for Evolutionary Anthropology in Leipzig. "With stone tools in hand to quickly pull off flesh and break open bones, animal carcasses would have become a more attractive source of food. This type of behavior sent us down a path that later would lead to two of the defining features of our species -- carnivory and tool manufacture and use."

To determine the age of the butchered bones, project geologist Dr. Jonathan Wynn relied on a very well documented and dated set of volcanic deposits in the Dikika area. These same deposits were previously used to determine Selam's age, and they are well known from nearby Hadar, where Lucy was found. The cut-marked bones at Dikika were sandwiched between volcanic deposits that have been securely dated to 3.24 and 3.42 million years ago, and they were located much closer to the older sediment. "We can very securely say that the bones were marked by stone tools between 3.42 and 3.24 million years ago, and that within this range, the date is most likely 3.4 million years ago," says Wynn, a geologist at the University of South Florida.

Both of the cut-marked bones discovered at Dikika came from mammals -- one is a rib fragment from a cow-sized mammal, and the other is a femur shaft fragment from a goat-sized mammal. Both bones are marred by cut, scrape, and percussion marks. Microscope and elemental analysis using secondary electron imaging and energy dispersive x-ray spectrometry demonstrated that these marks were created before the bones fossilized, meaning that recent damage can be eliminated as the cause of the marks. Additionally, the marks were consistent with the morphology of stone-inflicted cuts rather than tooth-inflicted marks. Dr. Hamdallah Bearat from the Ira A. Fulton Schools of Engineering at Arizona State University determined that one cut-mark even contained a tiny, embedded piece of rock that was likely left behind during the butchering process.

"Most of the marks have features that indicate without doubt that they were inflicted by stone tools," explains Dr. Curtis Marean from the Institute of Human Origins at Arizona State University, who helped with the mark identifications. "The range of actions that created the marks includes cutting and scraping for the removal of flesh, and percussion on the femur for breaking it to access marrow."

While it is clear that the *Australopithecines* at Dikika were using sharp-edged stones to carve meat from bones, it is impossible to tell from the marks alone whether they were making their tools or simply finding and using naturally sharp rocks. So far, the research team has not found any flaked stone tools at Dikika from this early time period. This could indicate that the Dikika residents were simply opportunistic about finding and using sharp-edged stones. However, the sedimentary environment at the site suggests another potential explanation.

"For the most part, the only stones we see coming from these ancient sediments at Dikika are pebbles too small for making tools," says McPherron. "The hominins at this site probably carried their stone tools with them from better raw material sources elsewhere. One of our goals is to go back and see if we can find these locations, and look for evidence that at this early date they were actually making, not just using, stone tools."

Regardless of whether or not Selam and her relatives were making their own tools, the fact that they were using them to access nutritious meat and marrow from large mammals would have had wide-ranging implications for *A. afarensis* both physically and behaviorally.

"We now have a greater understanding of the selective forces that were responsible for shaping the early phases of human history," says Alemseged. "Once our ancestors started using stone tools to help them scavenge from large carcasses, they opened themselves up to risky competition with other carnivores, which would likely have required them to engage in an unprecedented level of teamwork."

While many questions remain about the history of tool use, tool making, and related dietary changes among human ancestors, this discovery adds a rich new chapter to the story -- a story that is deeply relevant to what makes us unique as a species.

This research was conducted under the auspices of the Ethiopian Authority for Research and Conservation of Cultural Heritage / Ministry of Culture and Tourism. Financial support for the 2009 field and laboratory work was provided by the California Academy of Sciences. Travel expenses for D.G., S.P.M., D.N.R. and J.G.W. were covered by their respective institutions.

Practice Of Farming Reaches Back Farther Than Thought

ScienceDaily (Feb. 20, 2007) — Ancient people living in Panama were processing and eating domesticated species of plants like maize, manioc, and arrowroot at least as far back as 7,800 years ago -- much earlier than previously thought -- according to new research by a University of Calgary archaeologist.

One of the most hotly debated issues in the discipline of archaeology is how and why certain human societies switched from hunting and gathering to producing their own food through agriculture. Dr. Ruth Dickau, a post-doctoral researcher in the U of C's department of archaeology, has used a new technique called starch grain analysis to recover microscopic residues of plants directly off the stone tools that people were using in Panama 3,000 to 7,800 years ago. "These results add to the growing evidence that the earliest beginnings of farming were not centred in arid highland regions like central Mexico and the Peruvian Andes as once believed, but in the lowland areas and humid forests of the American tropics," Dickau says.

"What is particularly interesting is that these crops were originally domesticated outside of Panama; maize was domesticated in Mexico, and manioc and arrowroot in South America. Panama, as a relatively narrow land-bridge between the two American continents, was an important route for the human spread of food crops, and clearly a region where agriculture was practiced very early in history."

Dickau is the lead author of a paper appearing next week in the online early edition of the Proceedings of the National Academy of Sciences, an internationally respected academic publication. The paper is titled "Starch Grain Evidence for the Pre-ceramic Dispersals of Maize and Root Crops into Tropical Dry and Humid Forests of Panama." Dry, arid areas favour archaeological preservation, whereas tropical regions typically don't -- especially when it comes to foodstuffs. But with starch grain analysis, researchers are able to isolate residue from microcrevices in both ground stone and flaked stone tools and identify preserved starch grains under a microscope.

"The ability of starch grain analysis to identify plant taxa in the unfavourable preservation environments of western and central Panama confirms the importance of this method for establishing the presence of particular plant species, both domesticated and wild, in the subsistence practices of early inhabitants of tropical forests," the authors write.

Much of Dickau's research was conducted as part of her graduate studies at Temple University in Philadelphia. The second and third authors are Anthony J. Ranere (Temple University), and Richard G. Cooke (Smithsonian Tropical Research Inst., Panama).

2012 IPCAS Officers, Board Members, and major functions

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MEMBERSHIP APPLICATION - INDIAN PEAKS CHAPTER
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Quarterly new member enrollment	Individual	Family	Student
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April-June	\$21.50	\$24.75	\$10.75
July-September	\$14.25	\$16.50	\$7.25
October-December	\$7.25	\$8.25	\$3.75

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Signature: _____ Signature: _____

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Boulder, CO 80308-1301