

MAMMOTH TRUMPET



Volume 29, Number 1
January, 2014

Center for the Study of the First Americans
Texas A&M University, 4352 TAMU, College Station, TX 77843-4352

Department of Anthropology
ISSN 8755-6898

World Wide Web site <http://centerfirstamericans.org> and <http://anthropology.tamu.edu>

Looking Back at Over 40 Years of Research on the Peopling of Latin America

by Ruth Gruhn

Editor's note: Ruth Gruhn was asked to give a keynote speech reviewing her long experience in Paleoamerican research in Latin America at the conference entitled "VI Simposio Internacional: El Hombre Temprano en América: Modelos de Poblamiento y Aportes desde las Territorialidades Tropicales," which was held 19–24 November 2012 in Pereira, Colombia. This 2-part series is the English version of her presentation.

Part 2: On to Argentina and Uruguay

OUR FIRST STOP in Argentina was the foothills city of Mendoza, where we met with Juan Schobinger, a prominent scholar in Early South American studies. We visited some early cave

sites in the semi-arid country near the city of Córdoba in northwestern Argentina, including Intihuasi and Ongamira. We had learned that the Sociedad de Arqueología Argentina was to hold its annual conference in the city of Rosario, so we attended,



ALL PHOTOS: RUTH GRUHN

INSIDE

4 The Conference, a happening that was worth the trip!

Ariane Pinson, who was our eyes and ears at presentations delivered in Santa Fe, gives us a scientist's appraisal of their impact on First Americans studies.

making the acquaintance of a number of Argentine archaeologists, including Alberto Rex Gonzales, who graciously invited us to a barbecue at his nearby ranch. Following an examination of several open sites on the Pampas, our last stop in Argentina was to visit the renowned Museo de La Plata, in the university town of that name, south of Buenos Aires. We were to attend an international conference on Paleoamerican research in the grand old museum in 2000; and I again in 2010, when Alan's memory was honored.

In June 1970 we passed rapidly through the small country of Uruguay, as early archaeological sites there were as yet unknown. What a difference 40 years has made! Now a number

Examining the exposed stratigraphic profile at Fell's Cave.

of Paleoamerican localities have been recorded in Uruguay, the most significant at Pay Paso I, a well-stratified open site with Fishtail points and a blade industry in association with bones of extinct horse and glyptodon, dated to ca. 13,000 years ago (ca. 11,000 RCYBP).

Brazil, Alan Bryan's old friend

We arrived at the Brazilian frontier, and had to switch languages to Portuguese. I struggled, but Alan had experience and did better. Alan had worked on a *sambaquí* (shellmound) in southern Brazil in 1959, and so had friends among Brazilian archaeologists. First we visited the well-known archaeologist Pedro Ignacio Schmitz at his research institute in the city of São Leopoldo in Rio Grande do Sul state. Padre Schmitz was later to excavate early rockshelter sites in the



Alan's Mayan field assistant Manuel Tzoc starts a test pit at Los Tapias, Guatemala.

interior state of Goiás. Passing north into the state of Santa Catarina, of course we just had to visit Alan's old site at Forte Marechal Luz on the Ilha de São Francisco; and of course it was overgrown with thick brush, with hardly any shell to be seen. We got a look at a freshly exposed *sambaquí* section later, with a visit to the hilltop site of Enseada, being excavated by Anna Maria Beck. In the state of Paraná we spent a memorable night in the center of the city of Curitiba, as swarms of proud Brazilians danced the samba in the streets to celebrate Brazil's victory in the 1970 World Cup.

We had heard of early archaeological sites in the area of the city of Rio Claro

in São Paulo state, so we went there in order to look for Tom Miller, the archaeologist. But where in the city would he be found? We sat down to lunch in a barbecue restaurant and talked about the problem. Suddenly a group of young men at a nearby table rose and surrounded us. They were Tom Miller's students. So we got together with Tom; and he showed us his sites, with flaked lithic pieces in thin strata of fine gravels exposed within deep

silt deposits. It seemed to us, however, that the lithics were not artifactual.

Finally we arrived in Rio de Janeiro and were able to rent a temporary apartment in Copacabana. We made a trip north into the interior state of Minas Gerais in order to visit the famous cave locality of Lagoa Santa, near the city of Belo Horizonte. We examined known sites such as Confins Cave; and also visited the rockshelter sites of the limestone bloc known as Cerca



The Mammoth Trumpet (ISSN 8755-6898) is published quarterly by the **Center for the Study of the First Americans**, Department of Anthropology, Texas A&M University, College Station, TX 77843-4352. Phone (979) 845-4046; fax (979) 845-4070; e-mail csfa@tamu.edu. Periodical postage paid at College Station, TX 77843-4352 and at additional mailing offices.

POSTMASTER: Send address changes to:

Mammoth Trumpet

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4352 TAMU
College Station, TX 77843-4352

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Mammoth Trumpet, Statement of Our Policy

Many years may pass between the time an important discovery is made and the acceptance of research results by the scientific community. To facilitate communication among all parties interested in staying abreast of breaking news in First Americans studies, the **Mammoth Trumpet**, a science news magazine, provides a forum for reporting and discussing new and potentially controversial information important to understanding the peopling of the Americas. We encourage submission of articles to the Managing Editor and letters to the Editor. Views published in the **Mammoth Trumpet** are the views of contributors, and do not reflect the views of the editor or **Center** personnel.

—Michael R. Waters, Director

Grande, excavated by Wesley Hurt and Oswaldo Blasi in the late 1960s. In 1977 we were to return to Minas Gerais; and on a survey near the town of Januária on the São Francisco river, we discovered the rockshelter site of Lapa do Boquete, later excavated by the archaeologist André Prous of the Universidade Federal de Minas Gerais, who recovered in his lowest level a unifacial lithic industry in association with remains of varied plants, small mammals, and giant land snails. Dates on the occupation by these foragers ranged between 14,000 and 13,000 years ago (ca. 12,000–11,000 RCYBP).

After a month in Rio de Janeiro, our long journey came to an end. We returned to Canada by plane, while our Land Rover traveled home by ship. The faithful Land Rover still works in the field, now employed by Loren Davis of Oregon State University on archaeological projects in Oregon and Idaho (**MT 25-4**, "Life of Its Own").

Time to rethink Paleoamerican archaeology

The effect of our trip upon our thinking about the first entry of humans into the Americas was enormous. Through our personal experience, we had come to appreciate the great diversity of environments and Paleoamerican cultural complexes in South America. We were able to draw two essential conclusions. First, we had seen that the earliest cultures of the southern continent were very different in character, much more varied, than those of North America. Second, some archaeological sites were older than Clovis, indicating that there were people in South America before the development of the Clovis horizon in North America. We were sure, then, that Clovis was not the primordial culture of the New World, but rather a regional development in North America.

In the years following our journey, the number of South American archaeologists engaged in research on Paleoamerican sites increased rapidly. A new generation of young researchers emerged in all countries of South America, well trained in modern theory and methods of reconnaissance, excavation, laboratory analyses, paleoenvironmental and cultural interpretation,

with complete scientific publication of data and conclusions.

As a result of this impressive development of archaeological science in the countries of South America, an increasing number of archaeological sites of Pleistocene age have been discovered, in each region of the continent. New sites in southern Patagonia, such as Tres Arroyos, Cueva del Medio, Cueva del



◀ Examining the quartzite outcrop at the site of Chivateros, coastal Peru.

▼ The interior of the cave of Pikimachay, as the excavation approached the level of the Ayacucho Complex.



Lago Sofia, Los Toldos, Piedra Museo, Cerro Tres Tetas, and Cueva del Minero 1, clearly indicate that Paleoamericans had arrived at the end of the southern continent before 13,000 years ago (11,000 RCYBP). Farther north, in the grassy pampa, the sites of Arroyo Seco 2, Cerro La China, Cerro El Sombrero, and Pay Paso 1 also have late-Pleistocene dates.

Far to the north and east, in the semi-arid forested uplands of eastern Brazil, the Lapa do Boquete, among other excavated rockshelter sites, has yielded dates back to 14,000 years ago (12,000 RCYBP). In the Amazon rain forest, the rockshelter of Pedra Pintada, dated at ca. 13,000 years ago (ca. 11,000 RCYBP), demonstrates that already in the late Pleistocene there were well-adapted foragers exploiting the varied resources of the tropical forest.

We now know as well that there were also significant archaeological sites of late-Pleistocene age in the Pacific coastal zone of South America. In desert coastal Peru, the sites of Quebrada Jaguay, Quebrada Tacahuay, and the late-Pleistocene occupations recently discovered by Tom Dillehay at Huaca Prieta demonstrate the establishment of subsistence economies based on the products of



A sambaqui exposed by excavation at the site of Enseada in Santa Catarina state, Brazil.

the sea by 14,000–13,000 years ago (12,000–11,000 RCYBP). The most famous site west of the Andean chain is Monte Verde

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PALEOAMERICAN the conference that was!

BY ANY STANDARD YOU USE TO measure it, the Paleoamerican Odyssey Conference that took Santa Fe by storm October 16–19 was a spectacular, unqualified success.

The sheer number of persons attending—1130—is sufficient to persuade the doubtful. That the total attendance was nearly evenly divided between professional archaeologists, scholars in other disciplines, and students on the one hand, and avocational archaeologists and the general public on the other is encouraging news that the peopling of the Americas is a subject that is capturing the attention of an increasingly large segment of the population here and abroad.

You can draw encouraging inferences from the 140 colleges and universities that are home to faculty and students who attended. They span the gamut from Bourdeaux 3 University in France, Cam-

Jose Lucero, a Tewa Elder of the White Corn Family and Winter Clan, solemnized the opening and closing of the conference with invocations in the language of the Santa Clara Pueblo.

bridge University in UK, Heidelberg University in Germany, and Keio University in Japan to University of Alaska, five campuses of the State University of New York, and College of Menominee Nation in Wisconsin. Also attending were archaeologists from 54 museums and institutions including the Max Planck Institute of Germany, the Russian Academy of Science,

Heroes of the conference! Christel Cooper, Rebekah Luza, Cindy Hurt, and other workers made an astonishingly efficient operation of registering attendees and selling books and souvenirs.



the Denver Museum of Nature & Science, and the Montauk Indian Museum in New York.

If you aren't impressed yet, then take note that archaeologists also attended from 11 U.S. Government agencies and 37 archaeological consulting companies. Avocational archaeologists, too, those dedicated souls who are driven by the love of discovery, were drawn from 49 archaeological societies across the U.S. Especially encouraging are the significant numbers of individuals in attendance from archaeological conservation groups, public outreach organizations, and Native American groups.

They flocked to Santa Fe to hear presentations by what is unquestionably the most prestigious gathering of scholars that will be assembled anywhere in the world for years to come. In all, 36 international authorities on every conceivable scientific discipline that touches on the First Americans reported their discoveries, their theories, and their

predictions to an audience that invariably filled, often to overflowing, the cavernous auditorium of the Santa Fe Convention

Center. Japan, Latin America, Russia, Denmark, France, and the UK can boast of supplying scientists who contributed alongside those from North America to our growing corpus of knowledge of how the Americas were peopled.

The oral presentations, though extraordinarily engrossing and thought-provoking, weren't the only attraction that drew crowds at the Paleoamerican Odyssey Conference. Posters abounded in enclaves separate from the auditorium.



NORBERT FIKS



HEATHER SMITH



JOHN PAFFORD

Visitors feasted on these graphic capsules of information that told of a project or archaeological site dear to a particular scientist's heart. Limited space made it necessary to rotate the posters on display. Even so, the demand was so great that an essential skill for an onlooker was the ability to negotiate one's way through a crowd.

Space was also at a premium in the rooms where artifacts were displayed. There were stone and osseous tools galore from three continents, representative specimens from such varied technologies as Folsom, Clovis, Western Stemmed Tradition, Fishtail, and the Japanese Upper Paleolithic microblade, as well as such stunning individual icons as the Cinmar biface and the Fenn Cache. The exhibits gave everyone a chance to inspect up close much of the primary archaeological evidence that underpins key arguments presented at the conference. The totality of artifact displays was a treat that almost certainly won't be seen again in this decade.

For anyone who cared to probe deeper into the profuse information in artifact displays, posters, and presentations, *Paleoamerican Odyssey* was available as an invaluable reference. Nearly 600 pages long, this book,



NORBERT FIKS

shop sites, and arguing the pros and cons of the contentious "Clovis Comet."


A final treat awaited those with the foresight and good fortune to attend the Paleoamerican Odyssey Conference, a banquet that featured tasty cuisine and a wonderfully illuminating presentation by Peter Hiscock on the peopling



JOHN PAFFORD

Basking in Santa Fe sunshine are the CSFA team (left-right) Mike Waters, Kelly Graf, and Ted Goebel. Together with Tom Pertierra and the South-eastern Paleoamerican Survey, DSO, they worked for 2½ years planning and organizing the conference.

of Australia. Dr. Hiscock compared and contrasted the migration into Australia 50,000 years ago with the unfolding story of the peopling of the Americas and related, with a droll sense of humor, the unique problems that confront archaeologists in the vast arid interior of his native land.

All this took place in the most glorious setting imaginable, the sparkling sunshine of the high desert Southwest in late October. That's an unqualified success in anyone's book. 

—JMC

Better steel yourself if you want to visit the poster displays.

which contains the full-length papers of 31 presentations delivered orally at the conference, is rife with drawings, photos, charts, and tables that illuminate every facet of the subject. (It isn't too late to purchase your copy; see the rear cover for ordering information.)

Those who came to the conference to work had their opportunity at roundtable discussions that convened at the close of each day. Here participants had the chance to exchange ideas with authorities and their peers on such topics as searching for evidence of early Americans at chert quarries and work-


It was Standing Room Only in the auditorium of the Santa Fe Convention Center for most presentations.



TAKING STOCK

SINCE 1999, when, still in graduate school, I attended the CSFA Clovis and Beyond Conference in Santa Fe, perhaps the most outstanding development in the story of the peopling of the Americas has been the discovery of tremendous cultural variation in the late-Pleistocene record of Northeast Asia, Beringia, and North and Latin America. The classical model that drew a seamless transition from Clovis points in North America to Fishtail points in Central and South America has been utterly undone in the past dozen years. The audience at the 2013 Paleoamerican Odyssey Conference learned that

archaeological finds once dismissed as anomalies now form the core of diverse cultural complexes that coexisted throughout this region during the Bølling-Allerød (14,600–12,800 CALYBP) and before.

In the following series of articles I look at tantalizing new discoveries that shed new light on, and often radically reform, our understanding of the earliest peopling of Northeast Asia and the New World. 

—Ariane Pinson

Renaissance Science Consulting, <http://rensci.com/>



The Rising Tide of Northeast Asian Human Occupation

TO GET FROM THE OLD WORLD to the New in yesterday's textbooks meant a trip through Arctic Siberia and across the Bering Land Bridge. This was no simple task for early humans, who weren't equipped to deal with the harsh climate and unforgiving seasonal cycles of subsistence above 50°N latitude.

A severe jolt to anyone complacent with this cut-and-dried model is the evidence that humans extensively occupied northern latitudes between 55,000 and 20,000 years ago and, moreover, enjoyed an astonishingly varied material culture.

Late-Pleistocene cultural diversity in the New World has its roots in East Asia. As **Kelly Graf** (CSFA, Texas A&M University) discussed in her presentation on eastern Siberia, Early Upper Paleo-

a significant osseous projectile-point and tool tradition augmented by technologically expedient or informal stone tools. Osseous art objects, including diadems, bracelets, figurines, and other items of personal adornment, are important cultural elements, as elaborated by **Vladimir Pitulko** (Russian Academy of Sciences) in his discussion of the Yana RHS site.

During the LGM (Last Glacial Maximum, 26,500–19,000

CALYBP), people apparently retreated from the Far North. The period 24,000–21,000 CALYBP was very dry and cold, and the dearth of sites dating to this period indicates that people partially or wholly abandoned Siberia.

An interesting side note to the cultural similarity across Eurasia during the Middle Upper Paleolithic is the genetic data from the child buried at the Siberian site of Mal'ta,

which dates to 20,240 ± 60 RCYBP (24,000 CALYBP), just before the onset of the LGM. The child was two or three years old when it died, and genetic data indicate the child was a boy.

Selling CSFA publications doesn't have to be joyless work.



JOHN PAFORD

lithic and Middle Upper Paleolithic sites, spectacular in their own right, fit comfortably in line with lithic traditions later found in the New World: a flat-face blade-core technology, with

Eske Willerslev (University of Copenhagen) has pioneered whole-genome analysis of ancient DNA (aDNA), which he and his team have successfully applied to a 700,000-year-old horse and a 5,000-year-old Eskimo. The Mal'ta aDNA shows significantly mixed ancestry: Mitochondrial DNA (mtDNA) belongs to haplogroup U, found in contemporary populations in western Eurasia, South Asia, and North Africa; Y chromosome DNA indicates membership in haplogroup R, found in modern western Eurasian and South Asian populations. Statistical analysis of the whole genome showed similar affinities to modern western Eurasian, South Asian, and Native American groups. Interestingly, the Mal'ta individual shows no affinities to East Asian populations, but equal relatedness to a series of Native American groups. Willerslev therefore concludes that the Mal'ta individual was a member of a population ancestral to all Native Americans, which implies that Native American groups must have diversified after this period.

Following the LGM, Graf points out, Late Upper Paleolithic people surged northward, carrying with them an elaborate microblade technology involving wedge-shaped cores made on large bifaces



for making uniform microblades. The resulting blades were fitted to slotted bone or ivory points, a standardized technology. In addition to microblades, these people also made use of flake-core technology and occasionally bipolar reduction. These East Asian people associated with post-LGM Late Upper Paleolithic assemblages indulged in few art forms; they were highly mobile, residually organized, may have used dogs as beasts of burden, and as hunters exploited specific species, usually large- to medium-sized game. This contrasts with pre-LGM populations that were logistically mobile, appear not to have had dogs, and regularly subsisted on a wide range of game species.

Masami Izuho (Tokyo Metropolitan University) placed the origins of microblade technology in Hokkaido, the northernmost large island in the Japanese archipelago. As the climate deteriorated with the approaching LGM, populations became more pronounced on Hokkaido. During the LGM, Hokkaido and Sakhalin Island were linked by land bridges to each other and to the Asian mainland. Hokkaido thus became the southern limit of the Mammoth Steppe landscape consisting of mixed tundra and conifer forest. A small-flake tool tradition with discoidal and multi-faceted cores (30,000–22,000 CALYBP) gave way to three different types of stone-tool assemblages: flake based (30,000–22,000 CALYBP), which emphasized secondary retouch and end- and sidescrapers as the major tool forms; blade based (30,000–22,000 CALYBP), which depended on

highly standardized large blades; and a microblade tradition (26,000–15,000 CALYBP). These coexisting traditions share similar sites, which were occupied for very short periods, possibly only while toolstone was procured. The data give no clues about why one tradition was preferred over the others; perhaps it was because of site function, season of site occupation (organic preservation for most sites is very poor, so seasonality is unknown), or cultural differences.

Pitulko, in his closing discussion of the spectacular Middle Upper Paleolithic Yana RHS site, suggested that the cause for the rapid northward post-LGM expansion of microblades wasn't so much the switch to reindeer as the principal prey species as the decline of mammoths, which reduced the availability of ivory and bone for toolmaking. As mammoths became scarce, toolstone may have become increasingly important in the toolkit, and as a result, toolstone-conserving technologies, such as microblades, likely became increasingly important for these increasingly residually mobile post-LGM populations.

Crowd sourcing in Beringia

What happened next isn't entirely clear. Genetic data reviewed by **Connie Mulligan** (University of

Proboscidean long bones bearing cutmarks count as artifacts.

Florida, Gainesville) indicate some sort of population "pause" in Beringia. After analyzing the DNA of modern populations with collaborator **Andrew Kitchen** (University of Iowa), she proposes a three-stage model for colonization of the Americas. Initial divergence from an ancestral population in the Lake Baikal area of southern Siberia/Mongolia (close to Mal'ta) occurred between 30,000 and 40,000 CALYBP, the earlier time frame being more likely.

All the major haplogroups found in America are also found in east Central Asia, although at lower frequencies. However, not all east Central Asian haplogroups are present in Native American DNA. The absence of Central Asian haplogroups in the Americas likely indicates that the migrants were a non-representative subset of the population; that an East Asian admixture is absent in Native American DNA suggests rapid movement away from Central Asia, leaving a "light footprint" that may not be archaeologically visible.

Once in Beringia, population migration stalled for 7,500 to 15,000 years, sufficient time to accumulate genetic mutations that are common to all Native American populations. The effective population in Beringia (the number of individuals capable of producing offspring) during this "Beringian Standstill" was about 2,000 individuals, which translates into an estimated actual population of about 8,000 to 10,000 people.

Entry into the Americas, which likely occurred around 16,000 years ago, involved a subset of this Beringian population

of maybe 1,000 individuals; the remaining Beringian population may have died out. Mulligan is quick to point out that by “entry” she really means genetic divergence among Native American groups, which may have occurred when people arrived south of the ice sheet and not necessarily in Beringia. For instance, this might signify the rapid expansion of Clovis populations at 13,000 CALYBP rather than the initial colonization pulse, which could have been earlier if populations remained small. Migration was so rapid that all four major haplogroups appear in all modern populations and none was lost. An effective founding population of 1,000 (of a total population of approximately 5,000 people) then expanded 80-fold over a period of about 4,000 years. The speed of expansion suggests a rapid entry along the coast, followed by slow penetration inland. There is no evidence for gene flow back to Asia.

One people, many cultures

The proposed genetic uniformity of Beringian populations stands in stark contrast with the technological diversity of eastern Beringian archaeological sites. **Ben Potter** (University of Alaska Fairbanks) described the rapidly expanding record of sites dating before 10,000 CALYBP in the Tanana and Upper Nenana Basins south of the Yukon River near Fairbanks. No Clovis sites are known from this area, although sites of equivalent age and slightly older are well documented.

There was a steady flow of visitors to the artifact displays.

At Mead, where Potter has opened an area of 200 m², the lowest level, CZ5, pre-Clovis in age, has produced 200 bone fragments associated with 20 quartzite flakes, and two bison bones bearing cutmarks. The Clovis-contemporary CZ4 level yielded some 1,600 flakes, cores, and expedient tools, and 4 bifaces including a preform, a teardrop point on a flake, and a triangular point on a flake. These projectile points are morphologically and technologically similar to those of slightly younger Chindadn points. The CZ4 level also produced five areas of lithic activity, dispersed faunal scatters, and arcs of flake debris associated with a hearth that altogether may indicate where a structure once stood. The CZ3B level, post-Clovis in age, produced 5,000 flakes, a few microblades, two flake cores, expedient tools, and bifaces and biface fragments.

At Swan Point, a similar assemblage is found in the Clovis-age level that dates to 13,000–12,000 CALYBP. After 12,000 CALYBP, lanceolate points become common at this site.

The Upper Sun River site boasts a pre-Clovis level consisting of a hearth, activity areas, and evidence for fauna processing that dates to 13,200 CALYBP. A cultural zone yielded evidence

of a house with an inside hearth, where the occupants busied themselves maintaining tools inside and bifaces outside. Projectile points are edge-ground lanceolate forms that postdate 12,000 CALYBP. Excavations at Upper Sun River also yielded a cremation burial of an infant 2–3 years of age dating to 10,500 CALYBP.

Based on these and other sites in the immediate region, Potter proposes a revised regional chronology: pre-Clovis sites in Eastern Beringia (14,000–13,500 CALYBP), which are

allied with the Siberian Diuktai tradition; sites dating to the Clovis period (13,500–12,800 CALYBP) and Younger Dryas (12,800–11,700 CALYBP), where Chindadn technology dominates; followed by a post-Younger Dryas shift to lanceolate projectile forms consistent with the Denali tradition. These technological changes are associated with a shift in subsistence focus from mammoth during the Diuktai, to bison and wapiti (elk) during the Clovis period, to a much wider suite of large and small mammals, birds, and fish during the Younger Dryas, and to a refocus on bison and wapiti following the Younger

Dryas. The expanded diet breadth during the Younger Dryas is a result of the challenging cold and arid conditions, which severely disrupted animal populations. Following the Younger Dryas, as the population of large game animals increased in response to the ameliorating environment, hunters could again adopt a risk-averse strategy, with a consequent contraction in diet breadth. Potter observes that the contracted post-Younger Dryas diet breadth likely indicates low nutritional stress in the early Holocene.

Heather Smith (Texas A&M University) has been working in the Brooks Range, particularly on a relict of the Bering Land Bridge along the northwestern coastal plain. The region is characterized by Mesa lanceolate-point assemblages (~12,500–10,700 CALYBP), Sluiceway lanceolate-point assemblages (~13,200–11,000 CALYBP), and a Northern fluted-point complex (~12,700–10,700 CALYBP). Northern fluted points, which are multiple-fluted bifaces, have recently been recovered from Serpentine Hot Springs (SHS) and Raven Bluff on the Seward Peninsula. SHS is a campsite located on an overlook containing three hearth features




HEATHER SMITH

and associated lithic debris, fluted points, channel flakes, blades and bladelets, microblade and biface fragments, and hundreds of burnt bone fragments. Willow charcoal dates the site to 12,000–12,400 CALYBP, some 700 to 1,000 years after Clovis to the south. Toolstone transported to the site from sources several hundred kilometers distant signals a highly mobile group of foragers. Raven Bluff has a similar archaeological record. Some 50 fluted points and various surficial artifacts have been found in the vicinity of the Mesa and Sluiceway sites on the Seward Peninsula and the western Brooks Range. The late dates suggest that Northern fluted points may represent the backwash of late Clovis northward through the re-opened Ice-Free Corridor from its origins in the south.

Taken together, for the period around 12,000, Potter and Smith have documented at least four contemporaneous distinct lithic traditions (Chindadn, Mesa, Sluiceway, and Northern Fluted) in an area stretching from just south of Fairbanks to Nome. Also identified were Diuktai, an older technocomplex, and Denali, a younger.

Living with diversity

The cultural diversity within Beringia at the close of the Pleistocene is quite astounding for the modest amount of area that has been archaeologically investigated. The presence of this diversity suggests a population bottleneck: You get the impression that different cultures were living together cheek-by-jowl in a crowded megafauna refugium. Today the evidence leads only to more questions. Does this diversity signify that multiple populations arrived from different parts of Siberia? Is this evidence of local populations competing with each other for territorial rights in a crowded landscape? Or does this diversity indicate isolation and lack of contact, each group experimenting with different technologies while ignorant of what other peoples were doing? And more importantly, given the emerging evidence for cultural diversity elsewhere in the Americas in the late Pleistocene with an antiquity that at present rivals or exceeds that of Beringia, how does the diversity we see in the archaeological records of Northeast Asia and Beringia relate to that found in New World populations south of the ice sheets? Perhaps we'll find answers to these questions at the next conference in Santa Fe! 

Monolithic No Longer: Cultural Diversity in North America before 13,000 CALYBP



IF **SPEAKERS** at the Paleoamerican Odyssey Conference presented data that raised more questions than answers about the East Asian and Beringian archaeological records, researchers working south of the ice sheets only added to the confusion. Whereas at the 1999 Clovis and Beyond Conference, Clovis reigned more-or-less supreme in North America south of the ice sheet, the intervening 14 years has shown that the real situation was far more complex than most of us imagined.

Below the ice sheet, things were complicated, as explained by **Mike Collins** (Texas State University) and **James Adovasio** (Mercyhurst University) in separate presentations. Contemporary with, and possibly prior, to Diuktai, proto-Clovis assemblages from the Gault and Friedkin sites may have shared the landscape with a wide range of other traditions that we're only just learning about, including bipointed bifaces from the Chesapeake Bay area; Miller lanceolate points at Meadowcroft Rockshelter, Cactus Hill, and Page-Ladson; and sites with flaked mammoth bone found along the Great Lakes. West of the Mississippi, lanceolate bifaces and possibly osseous-tool traditions were common. The record is far from complete; many sites are characterized by only a handful of dates, and traditions are identified on the basis of only a small number of sites and surface finds. But where there are dates, they indicate that

Clovis may have been neither first nor alone in late-Pleistocene North America.

Emerging traditions of the East

In eastern North America, at least three new cultural complexes are evident with dates as old as or older than Clovis. **Dennis Stanford** (Smithsonian Institution) offers as evidence Solutrean-like bipointed bifaces recovered by fishermen from places on the Atlantic shelf that were submerged by sea-level rise 22,000 to 24,000 years ago. They have also been recovered from stratified sites along the Delmarva Peninsula—PawPaw Cove, Miles Point, and Oyster Cove in Maryland—and two others where artifacts, including bipointed bifaces, cores, wedges, blades, and polyhedral blade cores, have been found beneath a 17,000 RCYBP (ca. 20,200 CALYBP) paleosol in contexts dating to 21,000 and 24,000 RCYBP. For Stanford, this establishes human presence on the mid-Atlantic seaboard south of the Laurentide Ice Sheet at the LGM. Based on similarities with Solutrean artifacts, he argues for a Solutrean migration westward into the New World around this time.

Miller unfluted lanceolate bifacial points occur at Meadowcroft Rockshelter in Pennsylvania, Page-Ladson in Florida, and Cactus Hill in Virginia, in contexts that date to 16,900–12,000 RCYBP (ca. 20,100–14,000 CALYBP). At Meadowcroft, the oldest

date of $19,600 \pm 2,400$ RCYBP (ca. 23,400 CALYBP) is on a carbonized bilaterally cut fragment of bark-like material that resembles plaiting strips from basketry. Adovasio summarized associated cultural materials that include lithic debitage, small prismatic-to-triangular blades, and artifacts of bone, wood, and plant fiber. At Meadowcroft, dietary evidence points to generalized foragers who exploited white-tailed deer and small game, and consumed plant foods such as hickory nuts, walnuts, and hackberries, in contrast with more megafauna-oriented Clovis diets in the West.

Mike Waters (CSFA, Texas A&M University) cited new evidence from Page-Ladson (dates associated with a mastodon and a bifacial tool) that support a post-LGM human presence in the eastern U.S. as early as 14,400 CALYBP.

At the Topper site in South Carolina, stratigraphy that dates to 14,000–20,000 CALYBP yielded an Upper Paleolithic-like chert assemblage comprising blades, scrapers, cores, and bend-break tools. As described by **Douglas Sain** (University of Tennessee), people traveled considerable distance to a chert outcrop at Topper and reduced this chert on site. Because the chert nodules have a thick, tough rind that requires considerable force to accomplish the initial stages of reduction, it's unlikely that these items are geofacts given the predominantly low-energy depositional environment at the site. Evidence for cobble reduction is clustered within the site. This Upper Paleolithic, not-Clovis assemblage has been tentatively given the name "Clariant Complex" by Sain and his collaborator, **Albert Goodyear** (University of South Carolina), the principal at this site.

It's all about megafauna

For a broad swath of central North America that was grassland during the terminal Pleistocene, the evidence points to a deep tradition of focused megafauna procurement. Sites in this region contain abundant evidence for butchered mammoth and, to a lesser extent, mastodon and bison. The vegetation and landscape favored large herds of grazers, like bison of the historic period, able to roam long distances in search of water and forage. These herds undoubtedly drew human hunters like moths to a flame.

In the Great Lakes area 13,450–11,200 RCYBP (ca. 16,000 CALYBP) foragers butch-

tion, green-bone fractures, and bone flakes. The Mud Lake and Fenske proboscideans were likely scavenged carcasses because they appear to have been stiffened when processed. Schaefer and Hebior, however, appear to be kill-butchery sites. At Hebior, two bifaces, a dolomite chopper, and a chert flake were directly associated with the bones; at Schaefer, two flakes were found underneath the mammoth pelvis. Nothing in the recovered lithics indicates proto-Clovis or Clovis affiliations.

Using a geoarchaeological model of landscape evolution in the High Plains of Kansas and Nebraska, **Rolfe Mandel** (University of Kansas) targeted outcrops of similar age and detected about half a dozen megafauna butchering sites tentatively dated to millennia preceding Clovis.

Other mammoth-butchering sites on the High Plains date even earlier: La Sena in Nebraska (ca. 18,440 RCYBP, roughly 21,900 CALYBP) and Lovewell II in Kansas (ca. 19,550 RCYBP, roughly 23,200 CALYBP). **Steve Holen** (Center for American Paleolithic Research) explained that these bones lying in fine sediment display abundant evidence for human butchery in the form of smashed limb bones, spiral fractures, and impact notches 5 cm in diameter. The damage cannot have been caused by trampling by other mammoths because although the limb bones have been processed for fuel and grease, the flimsier rib bones are virtually undamaged, the reverse of what you'd expect. Although chipped-stone tools aren't associated with these finds, large anvil stones that must be manuports are present and show evidence of bashing.

Holen then identified sites that are potentially much earlier, for example, the Burnham site in Oklahoma, where a bison

Dennis Stanford of the Smithsonian Institution, a favorite speaker at CSFA events, tells his audience about pre-Clovis sites on the East Coast.



ered mammoth and mastodon at the Schaefer, Hebior, Mud Lake, and Fenske sites. These sites lie on low-elevation moraines that overlooked marshy areas where the kills were made. According to **Dan Joyce** (Kenosha Public Museums), although no lithic tools were found at some of these sites, all four sites show abundant evidence that humans utilized the carcasses: cutmarks, wedge marks demonstrating intentional disarticula-

tion, green-bone fractures, and bone flakes. The Mud Lake and Fenske proboscideans were likely scavenged carcasses because they appear to have been stiffened when processed. Schaefer and Hebior, however, appear to be kill-butchery sites. At Hebior, two bifaces, a dolomite chopper, and a chert flake were directly associated with the bones; at Schaefer, two flakes were found underneath the mammoth pelvis. Nothing in the recovered lithics indicates proto-Clovis or Clovis affiliations.

although “not necessarily conclusive,” suggest an early, pre-LGM entry into the New World around the time folks in Siberia were exploiting mammoths and other game at the Yana RHS site. Humans could have entered into the New World at such an early date by traversing a continuous “mammoth steppe” that during the Middle Wisconsin is thought to have stretched from Siberia to Kansas across the Bering Land Bridge, then skirted the Canadian Rockies and a somewhat diminished Laurentide Ice Sheet.

Something different on the horizon

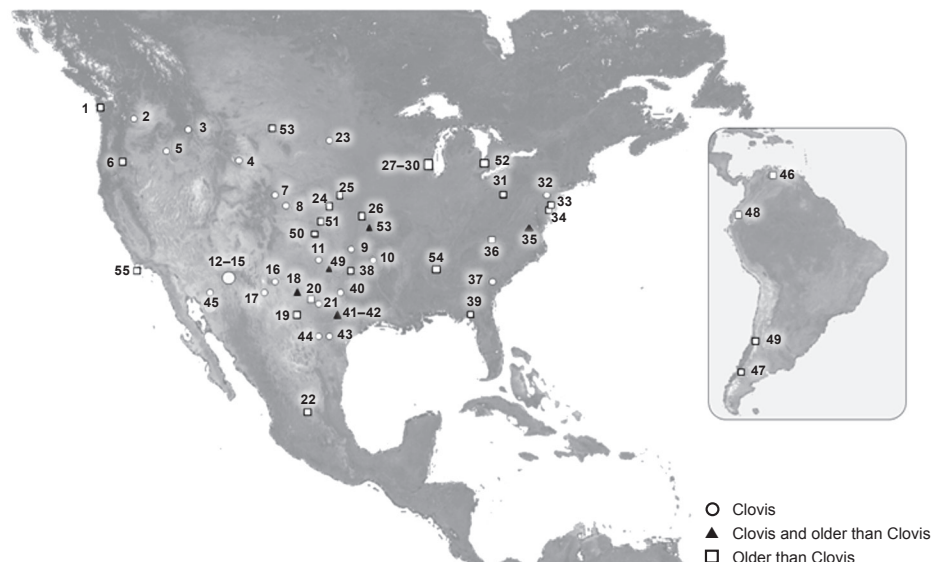
Little evidence exists for early occupations along the Pacific coast, although there is mounting evidence that people must have traveled some distance south before proceeding inland. It's likely that boats were an integral part of this migration. Sometime around 13,000 CALYBP, people crossed in boats to the Channel Islands off the coast of California, where they hunted megafauna and buried their dead. They may have been drawn down the coast by the richness and similarity of the

coastal resources from Alaska to southern California, according to the Kelp Highway Hypothesis of **Jon Erlandson** (University of Oregon), but the record is sparse and late in time. Earlier migrations likely occurred.

Coastal travelers may have followed the Columbia River or other waterways into the Intermountain West, where they found productive wetland environments dispersed across a megafauna-encrusted sea of grass. In this productive landscape, foragers wielding bone projectile points are known to have hunted mammoth. The site of Manis, Washington, initially discovered in the 1970s, was recently redated and reanalyzed by Mike Waters. The site consists of a partially disarticulated mastodon skeleton with a bone point 25–30 cm long embedded in its 14th right rib. Recent dates place the kill at about 13,800 CALYBP, several centuries before Clovis.

Who might have wielded this bone projectile is unclear. Clovis sites are rare in this landscape, however, and no artifacts have been recovered from stratified contexts. Where Clovis sites do occur, they are frequently very large. The Dietz site in

The impressive roll of older-than-Clovis sites in North and Latin America gave speakers at the conference plenty to talk about.



- | | | |
|--------------------|---------------------|------------------------|
| 1 Manis | 20 Sand Creek | 39 Page-Ladson |
| 2 E. Wenatchee | 21 Yellow Hawk | 40 Aubrey |
| 3 Anzick | 22 Tocuila | 41 Gault |
| 4 Colby | 23 Lange-Ferguson | 42 Friedkin |
| 5 Simon | 24 La Sena | 43 Pavo Real |
| 6 Paisley Cave | 25 Jensen | 44 Kincaid Rockshelter |
| 7 Dent | 26 Lovewell | 45 Fin del Mundo |
| 8 Drake | 27 Schaefer | 46 Taima-Taima |
| 9 Jake Bluff | 28 Mud Lake | 47 Monte Verde II |
| 10 Domebo | 29 Hebior | 48 Las Vegas |
| 11 Miami | 30 Fenske | 49 Querero II |
| 12 Murray Springs | 31 Meadowcroft | 50 Burnham |
| 13 Lechner | 32 Shawnee-Minisink | 51 Dutton Selby |
| 14 Naco | 33 Miles Point | 52 Firelands Sloth |
| 15 Escapule | 34 Oyster Cove | 53 Lindsay |
| 16 Blackwater Draw | 35 Cactus Hill | 54 Johnson |
| 17 Mockingbird Gap | 36 Saltville | 55 CA-SRI-512W |
| 18 Lubbock Lake | 37 Topper | |
| 19 Bonfire Shelter | 38 Cooperton | |

MICHAEL B. COLLINS ET AL.

In the millennia before Clovis, toolmakers in the Southern High Plains of Texas were quarrying Edwards chert at two sites along Buttermilk Creek, Gault and Friedkin. **Mike Waters** and **Mike Collins** noted that both sites contain assemblages that, although similar to Clovis, are technologically not quite Clovis; significantly, fluted bifaces are absent. At Gault, Collins reports finding small stemmed points with narrow necks in the pre-Clovis levels, along with a paved stone floor, blades, endscrapers formed on blades, modified flakes, a graver, and notches. At Friedkin, Waters reports as evidence of occupation 54 tools, including bifaces, discoidal cores, expedient tools, blades, bladelets, radially broken tools, and burins, along with hematite. All are associated with more than 60 OSL dates that place the occupation conservatively at 13,500–15,000 CALYBP.

Oregon, for example, yielded dozens of Clovis points from the surface but none from stratified contexts. Dietz at least has a limited site structure, as if people repeatedly paused at the site but didn't establish a long-term occupation. In marked contrast are sites left by groups long suspected of being Clovis contemporaries: Foragers using Western Stemmed Tradition (WST) points left behind ample evidence for long-term occupation in the form of hearths, stains interpreted as structures, and patterns of regional lithic raw material use.

The WST appears to have significant antiquity in the region, as evidenced by the securely dated Paisley Five Mile Point Caves. As related by **Dennis Jenkins** (University of Oregon), recent excavations at two of the caves have produced megafauna remains, cordage, human coprolites, and other organic materials dating as early as 14,900 RYBP (ca. 17,900 CALYBP).

The bifacial lithic assemblages consist of flakes, utilized flakes, and bifacial preforms. From a stratum coeval with early Clovis were recovered WST points along with handheld millingstones used to process plant foods. It's significant that none of the lithic debitage is consistent with Clovis: No blades, bladelets, overshot flakes, channel flakes, or fluted points have been recovered in these assemblages. Clovis occurs nearby at the Dietz and Sagehen Gap sites, but it's conspicuous by its absence at the Paisley Caves.

The idea of Clovis as a late-comer in the Intermountain West was supported by **Charlotte Beck** (Hamilton College), who described the technological distinctions that firmly separate Clovis from WST, but link Clovis to later, gracile fluted point forms in central Nevada that are contemporary with Folsom on the Plains. What Beck terms "true Clovis" has only been

CSFA Director Mike Waters infects the audience with his passion for pre-Clovis archaeology.



JOHN PAFFORD

found in a broad arc from western Wyoming northwest to the Snake River, then west into the eastern portions of Washington (East Wenatchee Cache) and Oregon (Dietz, Sagehen Gap). Beck argues that Clovis in these areas intrudes into already-entrenched WST populations, and brings with it distinct technology and land-use patterns. Whatever the interaction between these populations, the evidence indicates that Clovis technology and lifeways quickly disappeared, ceding the field to highly successful generalist foragers wielding WST lithic technology.

The movement of Clovis across the landscape was a theme also touched on by **Jack Ives** (University of Alberta). After reviewing evidence for the timing of the opening of the Ice-Free Corridor, he argues that it was likely closed in the millennium immediately before Clovis. As it began to open, he suggests, Clovis foragers followed the retreating ice northward. In an era of dramatic climate change in the Lower 48, the retreating ice

Gorgeous weather every day added to the enjoyment of the conference.



NORBERT FIKS

margin may have been one place where megafauna could still have been exploited using traditional (Clovis) methods. Following the corridor northward, at some point they would have encountered Beringian foragers pushing southward. The newly

opened corridor, its terrain rendered sterile in pre-Clovis times by the ice sheets, provides virgin ground on which to explore and understand the dynamics of such interactions.

That Clovis might shine a light on early interactions among foragers in the New World is fitting for a culture that for so long provided a beacon for archaeologists studying the terminal

Pleistocene in North America. Clovis may no longer be the first culture in the Americas, but the evidence strongly suggests they were the first to advance northward into the area of the Ice-Free Corridor. In doing so, they may shed light on what such "First contact" between scattered ancient populations elsewhere in the Americans was like at the close of the Pleistocene.

Competing interpretations of diversity

The presence of such diversity in the millennia preceding Clovis supports competing interpretations. Mike Waters proposes what can be thought of as the "short chronology" based on the

most securely dated sites. In this interpretation, migrants arrived in the New World around 15,000 CALYBP. Over the 2,000-year “Exploration Period,” people familiarized themselves with this new landscape, discovered the most important sources of toolstone, and exploited megafauna with an intensity that contributed to their decline. This “short chronology” is consistent with much of the genetic evidence.

By contrast, Mike Collins is a possibilist. The overwhelming abundance of sites dating between 27,000 and 13,000 CALYBP—even if all don’t ultimately prove to be of such antiquity—suggests to him that a “long chronology” is in order. He accepts as possible, even plausible, that people migrated to the New World prior to the LGM, and that at least some of these



people migrated across the North Atlantic to settle along the coastal areas of the central Atlantic and New England states. Somewhat later, people also migrated into the Americas along the Pacific margin of the continent. Between these two coasts, as many as seven cultural traditions may have co-existed in the more than ten millennia prior to Clovis. Clovis, he argues, is the mid-point and not the starting point of human occupation of the Americas.

Will the diversity hold up?

Presenters at the Paleoamerican Odyssey Conference repeatedly alluded to the idea of the Pre-Clovis Decay Curve ad-

vanced by **David Meltzer** (Southern Methodist University), which predicts that purported pre-Clovis sites will become increasingly marginalized and at last forgotten over a 30-year period as evidence for their early age and cultural nature erodes. The idea, proposed at a time when the number of well-excavated pre-Clovis sites was few and the sites readily

dismissed, seems strangely outdated today. It won’t be surprising if some sites reviewed at the conference are rejected in the future when better dating techniques and methodological refinements accurately distinguish between human activity and natural agency. Nevertheless, the years between the

University of Oklahoma archaeologist Leland Bement fields questions on his Clovis artifacts.

1999 Clovis and Beyond Conference and the 2013 Paleoamerican Odyssey Conference have witnessed an explosion in the number of pre-Clovis and non-Clovis late-Pleistocene sites and in the quality of the evidence for their age and human agency. Even if some sites prove in the end not to be sites at all, many are sure to survive reanalysis. In North America at least, the late-Pleistocene human occupation appears to have been early, culturally diverse, and rich in its evidence for human survival and cultural interaction in the face of rapid climate change and ecological collapse.

Making sense of this record is the next great task of archaeology. 



What about Clovis?

CLOVIS IS, OF COURSE, the best-known Paleolithic archaeological manifestation in the New World, and certainly in the Northern Hemisphere. Clovis archaeologists took to the podium on Friday morning to discuss advances in this field.

In separate papers, **Nicole Waguespack** (University of Wyoming) and **Gary Haynes** (University of Nevada) made the continuing case for a Clovis role in megafauna extinction in North America. Haynes argues that no matter how you look at subsistence evidence for this period, the vast majority of sites show evidence for megafauna procurement, specifically proboscideans, and also bison and horse. Although theoretical

arguments could be made that favor a broad-spectrum diet, the evidence continues to support at least a preference for megafauna in the diet, although other game and plants must have been included; plant consumption, after all, is necessary for obtaining essential vitamins, minerals, and other nutrients. Haynes points out that particularly as environmental change got underway during the Bølling-Allerød, leading to wide-scale drying of the midcontinent, proboscideans and other megafauna would have congregated in wet refugia, where the trails leading to gatherings of such titans provided even less-than-astute hunters with an unmistakable road map to preferred animal foraging areas. Because megafauna

simply weren't hard to find, search costs were dramatically reduced compared with more-dispersed game animals. Haynes presents a model of refugia (sources) linked by less-desirable landscapes the animals would have crossed to get from one refugium to the next. Human hunters following game likely followed a strategy that centered on proboscideans in refugia and a more diverse, opportunistic diet in the inter-refugial areas.

Waguespack takes on the extinction debate from a slightly different angle, focusing on the structure of the extinction debate. She emphasizes that the question of megafauna extinction—an event narrowly bounded in time—has to be divorced from other arguments about the peopling, including both the timing of entry and the speed of colonization. For Waguespack, it's immaterial whether Clovis was first or not, or whether the extinction was synchronous or staggered (although she argues for synchronous). The fact remains that it's Clovis artifacts we find intimately associated with dead proboscideans and other megafauna as the extinction event ran its course. Moreover, she cites humans as the most likely causal agent for extinction on account of their bias for larger-bodied prey. A huge environmental

**Beyond this point,
there be excitement.**

crisis, she argues, would have resulted in wholesale extinction of animals of all body sizes and surely would also have dramatically affected the human population. Such a blanket calamity, however, isn't evident in the archaeological or paleontological record.

Although the evidence for an essentially synchronous extinction is compatible with the fragmentary-comet impact theory presented by **James Kennett** (University of California–Santa Barbara) and colleagues, it isn't clear how size bias plays into this extinction theory. Kennett expounded the theory that a comet broke into fragments on entering the atmosphere and exploded in an air burst (like the recent Russian meteor). Evidence can be found, he argues, at a number of archaeological sites where the YDB (Younger Dryas Boundary, 12,800 CALYBP) is clearly evident in the stratigraphy by the presence of nanodiamonds and magnetic spherules in concentrations possible only as the result of a cosmic event. Other sites display atypically high pro-

portions of iridium, osmium, and platinum. Moreover, effects weren't confined to North America; evidence can also be found in northern South America, Europe, and the Middle East. At the site of Abu Hureyra in Syria, for example, faunal remains dating to 12,800 CALYBP are coated in melted aluminosilica and silicate glass spatters, and some bones were heated so intensely they melted. Furthermore, the YDB is marked by abrupt changes in

atmospheric circulation evident in the Greenland Ice Core (although temperatures took 180 years to plummet). The authors argue that the resulting environmental cataclysm could easily account for the extinction of the megafauna. They also find supporting evidence for concurrent environmental destruction in data from the Greenland Ice Core recently recalibrated by Paul Mayewski (University of Maine), which they claim show that the onset of the Younger Dryas was accompanied by abrupt increases in biomass burning, intensified wind strength, and heightened dust loads.

Regardless of whether a cosmic impact struck the final blow to the megafauna, the landscape was undergoing severe changes from different forces impinging on the continent: ice unloading, sea-level rise, and dramatic changes in precipitation. **Vance Holliday** (University of Arizona) recounted the consequences of the Bølling-Allerød and Younger Dryas transitions: rapid sea-level transgression along the mid-Atlantic and Gulf coasts, as well as the northwest Pacific coast; the rapid expansion

and catastrophic drainage of proglacial lakes, including Lake Agassiz and the proto-Great Lakes; and the desiccation of the pluvial lakes of the Great Basin and New Mexico. In the continental interior, rivers transported massive loads of glacial silt to increasingly arid lowlands, where winds swept great quantities of dust onto the plains, forming thick loess wedges and large dune fields.

Humans reacted to these changes, both economically and spiritually. A key method they used was to create toolstone caches, whether for utilitarian or ritual motives. **J. David Kilby** (Eastern New Mexico University) reviewed the current state of our knowledge of Clovis biface and blade caches. Currently known caches describe a V-shaped pattern anchored on Texas, one arm extending up to Washington State, the other reaching to the Great Lakes and beyond, as far north and east as Minnesota and Maine. Recent dating has established an age of 12,700 CALYBP for the Anzick Cache in Mon-



HEATHER SMITH


tana, and a tentative age of ca. 13,600 CALYBP for the Beach Cache in South Dakota based on a single radiocarbon date of $11,626 \pm 68$ RCYBP. In most cases a cache served to provision toolstone-poor landscapes that were regularly used for hunting by highly mobile human foragers. Caches are therefore notably absent in areas rich in toolstone outcrops (such as the Great Basin or Southeast). Caches give the lithics analyst a valuable complement to assemblages from hunting camps: Whereas the latter are usually discarded artifacts at the end of their use-life, caches display the Clovis toolkit at its beginning; they're a representative sample of what a well-equipped hunter carried at the start of a hunting cycle. Because burying a cache implies the intent to retrieve its contents, caches identify regular patterns of movement following initial colonization of the landscape. Artifacts found in caches add to our understanding of land-use patterns and regional variations in behavior. The irony, of course, is that every cache we discover represents a failure of the Clovis hunting party to return for whatever reason.

A few caches containing exceptionally oversized non-utilitarian pieces open a window on Clovis ritual. A notable example is the Anzick Cache, which is associated with the bones of a child and seems to represent a ritual offering. The Anzick Cache and other probable ritual caches may be one expression of Clovis as a millennialist revitalization cult as proposed by **Bruce Bradley** (University of Exeter, UK) and colleagues. The Clovis culture, he explains, emerged suddenly and spread rapidly in what was likely an already populated continent. The diminishing megafauna population, coupled with a deteriorating environment, likely fomented anxiety among Clovis foragers. A revitalization movement arises when members of a culture face a crisis and recognize that their current lifestyle is no longer effective. As despair among the members mounts,

an individual may arise who, through a series of revelations, charts a specific course of action and may prescribe specific rules that the population must follow to restore balance to the culture. This charismatic individual rapidly gains followers who enact the recommended changes and spread the "message" among neighboring peoples.

From Bradley's perspective, people already in North America at the start of the Bølling-Allerød faced enormous environmental changes that likely created an economic and social crisis. He floats the possibility that Clovis arose as an extreme version of antecedent technologies—a perfecting of hunting technology—at this moment of crisis. Thus Clovis appeared in a geological instant and spread widely into the next, consistent with a revitalization movement. Other Clovis traits are consistent with a revitalization movement:

- its highly sophisticated technology required great skill and involved high risk of failure;
- the culture flourished with little variation over a large area and across varied ecological zones;
- raw material was chosen to exacting standards that required intimate knowledge of available sources;
- iconic techniques, such as fluting and overshot flaking, were perfected and scrupulously employed;
- artifact design has an air of boldness and confidence, "in your face";
- esthetic and practical qualities were equally valued;
- the culture was rapidly established and short lived;
- ritualized behavior, such as a focus on megafauna hunting and votive caching, was deep seated.

Clovis, Bradley argues, can be considered a cult marked by beautifully complex technology and behavior. 

The Latin American Mosaic: Biological Homogeneity and Cultural Diversity before 10,000 CALYBP



PERHAPS THE MOST AMAZING NEWS HEARD at the Paleoamerican Odyssey Conference was emerging evidence for early technological and biological diversity, plant domestication, and social complexity in Central and South America. It's axiomatic that a culture increases in complexity the longer it occupies an area. But Latin America gives the lie to this premise, for we learned that semi-sedentary horticulturalists made their appearance before 10,000 years ago in regions south of North America.

Similarity is more than skin deep

In North America, early skeletons are broadly similar: Kennewick Man and other early skeletons fit together in a group that is more like modern Polynesians than other populations, including Native Americans. According to **Doug Owsley** (National Museum of Natural History), crania from these skeletons share such common features as long, narrow cranial vaults, short faces, and a large size compared with modern skeletons. Despite the relatively high cultural diversity seen

in early North Americans, their biological diversity is low.

A similar pattern is evident in Central and South American skeletons. Human remains from caves in southeastern Brazil, primarily from the Lagoa Santa area, vary little in size and morphology from a narrow range. Scientists have recovered from rockshelters more than 100 late-Pleistocene and early-Holocene skeletons, making this the largest population of skeletons from such early contexts in the Americas. **Mark Hubbe** (Ohio State University) discussed the results of his analysis of the crania of these

Skeletal remains submerged in a cenote in Yucatan. The stalactite signifies that the individual was laid to rest in a dry cave.

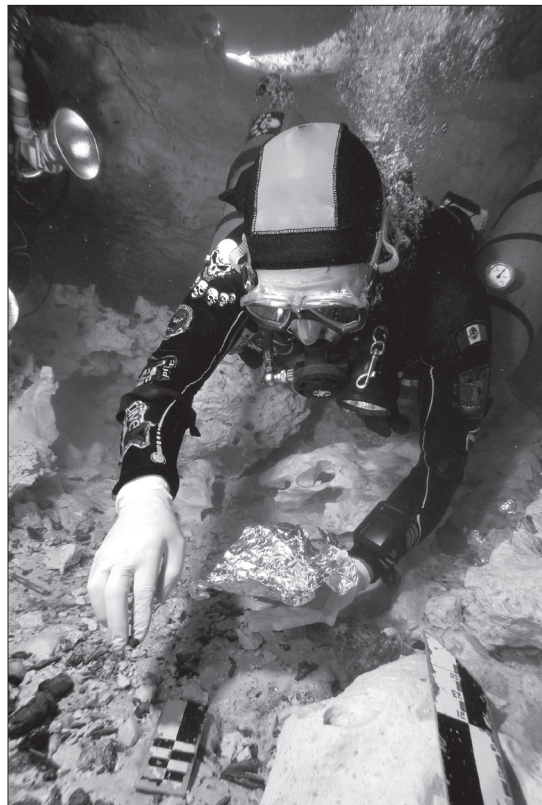


ARTURO H. GONZÁLEZ

skeletons. Although rockshelter occupation begins in the late Pleistocene, burial within these shelters at that time was rare. Of the Lagoa Santa skeletons, only the individual from Lapa Vermelha IV dates to the late Pleistocene; all others postdate 9500 RCYBP (ca. 10,800 CALYBP), when burial in caves became culturally important.

The range of craniometric variation among Lagoa Santa individuals is typical of the variation seen in a modern human population, which indicates that these skeletons can be treated as a population. Furthermore, morphological variation on a regional scale, encompassing individuals outside of Lagoa Santa, is much lower than we find among modern Native American populations. Even more interesting is that the cranial morphology of these skeletons differs remarkably little from that of coeval North American and Eurasian populations. The similarity among intercontinental populations that existed during the late Pleistocene and early Holocene stands in stark contrast to the diversity that had emerged throughout the world by the middle Holocene. How this diversity arose is unclear. It can be explained in part by the evolutionary processes of natural selection and genetic drift. Hubbe cautions,

Collecting the bones of a *Paleolama* . . . the hard way.



ARTURO H. GONZÁLEZ

however, that the contrast may be more apparent than real if driven in part by inadequate sample sizes. It may be that the much smaller skeletal sample from the late Pleistocene and early

Holocene simply doesn't accurately capture the complete range of variation present at the time.

The effect of evolutionary processes, however, may be evident in the skeletons recovered from the sites on the Yucatan Peninsula

in the province of Quintana Roo, Mexico, which differ from those of the Lagoa Santa. The Quintana Roo skeletons, reported by **Arturo González** (Museo del Desierto, Mexico), were recovered primarily from underwater contexts in *cenotes* (sinkholes), relics of a vast system of underground caverns that penetrate the limestone plateau of Yucatan. When sea levels were lower, so too were regional water tables. People who inhabited this region 9000 to 13,000 years ago occupied the subterranean caves and buried their dead there. What's more, springs in cenotes were important water sources in this riverless landscape. The people doubtless had a long, familiar congress, whether secular or sacred, with cenotes. Rising post-glacial water tables subsequently drowned these sites and preserved the skeletons.

A total of nine skeletons have been identified so far from the Quintana Roo cenotes, some associated with hearths and with megafaunal remains. Although some skeletons are arranged in no particular order, indicating accidental death, a number are articulated and positioned on the side or back as if intentionally laid to rest. Granted that a population of nine constitutes a small sample, González finds that the crania are mesocranial, with overall shape and size unlike the dimensions of the Lagoa Santa population and early humans from Mexico and Colombia. Instead, these skulls resemble skulls from early-Holocene North American sites such as Gordon Creek in Colorado, Marmes in Washington State, and Buhl in Idaho. It's interesting to note that minor features

of the skull anticipate features found in later Maya skeletons from the Yucatan region, which González argues as evidence for microevolution among these early populations.

Diversity of entryways and technologies

Despite the emergence of relatively small differences among New World skeletal populations by 9000 RCYBP, they are nonetheless remarkable for their similarity to each other and difference from later populations in the Americas. The same cannot be said of early technologies.

In South America, early cultures deployed a wide range of technologies in different environments. As **Adriana Schmidt Dias** (Universidade Federal do Rio Grande do Sul, Brazil) argued, between 12,440 and 8000 RCYBP (ca. 14,800–9000 CALYBP), Brazil was occupied by several different hunter-gatherer groups that pursued a largely generalist subsistence strategy. These groups may well have entered Brazil from different directions at different times. In her study, the earliest occupations appear during the late Pleistocene/early Holocene in the Sierra da Capivara along the northeast Atlantic Coast of Brazil and in the southeastern Lagoa Santa area, where sites with artifacts identified as belonging to the Itaparica Tradition have been found dating to 12,440–11,000 RCYBP (ca. 14,800–13,000 CALYBP). Itaparica Tradition assemblages consist of large utilized flakes, small cores, thick scrapers, end- and sidescrapers, and limaces. Bifacial flaking is known, and fragments of unifacial stemmed projectile points have been found. At Lapa do Boquete and other sites, such tools are associated with hearths.

At the same time, **Tom Dillehay** (Vanderbilt University) points out, there were present two very different industries in coastal Peru that expressed considerable regional variation. One is the Bifacial Tradition, which includes Fishtail, Paiján, El Jobo, and Monte Verde and other regional lanceolate and stemmed projectile-point styles. The other is the Edge-Trimmed Tradition, an industry where pebble tools and unifacial edge-trimmed tools predominate, found in Peruvian sites such as Huaca Prieta (dated to approximately 12,200 RCYBP, ca. 14,200 CALYBP), the Vale do Meio site in eastern Brazil (discussed at the conference by **Eric Boëda**), and possibly the Santa Elina rockshelter in southwestern Brazil. These highly informal assemblages consist of utilized flakes and cores with no evidence of use wear.

Although the early evidence for what South Americanists call the Pioneering Period is sketchy, across the continent diversified subsistence and technology appear to occur rapidly across the late-Pleistocene/early-Holocene boundary in what is termed the Establishment Phase. Dillehay points to the predominance of Fishtail and Paiján points in northern coastal regions of South America, which coincides with the emergence of the Central Andean Tradition (11,000–10,000 RCYBP, ca. 13,000–11,800

CALYBP) that includes triangular, sub-triangular, and willow leaf-shaped points. Along the Pacific coast and in parts of the tropical lowlands to the east, unifacial lithic industries are widely distributed.

Schmidt Dias documents expansion of occupation in Brazil at this time to the lower Amazon Basin and areas of central and southern Brazil. The evidence suggests a broad-spectrum diet based on small and medium-sized game with substantial reliance on plant foods even where megafauna are present. Rock-art styles become differentiated. In the lower Amazon, lithic assemblages comprise scrapers, limaces, blade-like flakes, graters, and bifacial artifacts, including stepped projectile points with triangular shapes. In central and northeastern Brazil and in parts of the Central Plateau, Itaparica Tradition artifacts were still made, although in southeastern Brazil technology became more expedient and small bifacial projectile points became common. In the Middle Uruguay Basin by 10,810 RCYBP (ca. 12,800 CALYBP), sites belonging to the Umbu Tradition dominate, typified by small bifacially edge-trimmed eared and stemmed projectile points, and bolo stones.

The importance of place

After 10,000 RCYBP (ca. 11,800 CALYBP), cultural diversity increased across South America, accompanied by an increasing sense of territoriality that emphasized the importance of place to these early residents. The burials at Lagoa Santa are bounded in time, occurring primarily 9500–6000 years ago, and highlight the importance of rockshelters as repeatedly used places within a larger human territory. That places might carry more than practical significance even to hunter-gatherers exploring largely virgin territory has been examined by **Nora Fle-**



Posters, by golly, and people to explain what you're looking at.

genheimer (CONICET, Argentina) and colleagues in studying late-Pleistocene/early-Holocene sites in Patagonia and the Argentinian Pampas. Here, evidence for occupation appears on isolated mesa tops with commanding views of the surrounding countryside. Important also is that these sites would have been singularly visible from the surrounding plains.

In the Pampas, the site of Cerro El Sombrero sits atop the highest hill in the area near a source of igneous-crystalline lithic raw material (orthoquartzite). This site is the densest and most extensive site in the area. Of the 1411 discarded tools recovered to date, 90% had been broken, primarily in use. The site has a particularly high incidence of bifacial tools compared with other sites in the region (175 Fishtail points and preforms), along with scrapers, raclettes, knives, graters, notches, and

nearly 10,000 flakes. Few cores are present in the assemblage. A strikingly similar site is Amigo Oeste several hundred kilometers away in Patagonia; also located on a hilltop with a commanding view, it has yielded many Fishtail points, most of them broken. Neither site offers shelter.

Flegenheimer describes the sites as special places where tools, principally those related to hunting, were brought to be discarded and replaced. The significant volume of discarded Fishtail-point bases speaks to repeated use of the locales for precisely this purpose. Exotic toolstones represented among the point bases suggest that points broken in use were deliberately returned to this particular location instead of being discarded where they failed. Flegenheimer suggests that these locations were imbued with a special meaning and served as important nodes in a wider-ranging settlement system. Whether the presence of such locations was a prerequisite for a people establishing themselves in a region isn't clear, nor can we determine what special meaning these places may have had. That these two sites are hundreds of kilometers apart, however, signifies that distant groups attached similar special meaning to like features of the landscape. By extension, this shared notion may indicate the existence of a social network between the two regions.

As a North Americanist, I am used to thinking of horticulture, sedentism, and the notion of territoriality as mid-Holocene phenomena that appeared when some unspecified threshold of population density

Many of the subjects presented at the conference were familiar to *Mammoth Trumpet* readers.

was reached. The landscape of South America, on the other hand, seemed to foster in humans a different relationship with it. Their lifestyle appropriated rockshelters for repeated short-term occupations and mesa tops as settlement "nodes." Dillehay credits early occupants with actively altering the landscape in which they settled, a process he terms "niche construction." Humans who first colonized the north coast of Peru around 12,200 RCYBP (ca. 14,200 CALYBP), and occupied sites dating to 11,500–10,200 RCYBP (ca. 13,500–12,000 CALYBP) show extensive evidence of niche construction. The earliest sites contain primarily unifacial edge-trimmed pebble tools used to exploit coastal marine and terrestrial fauna. Around 11,300–11,500 RCYBP (ca. 13,300–13,500 CALYBP) bifacial tools appear in the assemblages, initially made on non-local toolstone but increasingly on local varieties. Dillehay interprets this as evidence for the influx of migrants with bifacial technology from a previously populated area who could have moved on, but elected not to.

Over time, people apparently expanded their settlements farther inland and gradually learned to exploit a diverse array of local plants and animals unique to each ecoregion. Evidence for rock-lined tipi-like structures occurs in the archaeological


record, suggesting the emergence of short-term (seasonal?) sedentism. Around 10,100 RCYBP (ca. 11,900 CALYBP), while marine and terrestrial animals continued to be exploited, there suddenly appeared a range of new cultigens, including squash, quinoa, and avocado. Larger residential structures—up to 4 m in diameter and with thick floors—make their appearance. By 8000–9000 RCYBP (ca. 9500–10,500 CALYBP), these huts had become aggregated into small villages of up to eight dwellings made using adobe brick. Evidence shows the residents were now cultivating some 13 species of plants.

To construct a human landscape from natural elements the settlers had to select sacred sites and settlement nodes, design domestic architecture, and establish camps for processing seasonal resources. In this ecologically rich environment, people could have remained highly mobile hunter-gatherers; they



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weren't compelled to settle down. Yet settle down they did, in coastal Peru and several other areas of South America. Each region was characterized by a unique lithic technology, and the regions may have been colonized by humans at different times in the Pleistocene. Nevertheless the result is that by 10,000 RCYBP (ca. 11,800 CALYBP), in widely divergent environments, people were clearing land for cultigens, in some places irrigating these plots with small feeder ditches; erecting seasonal camps; and targeting a chosen subset of plant and animal species for subsistence.

The role of humans as agents of landscape change in Latin America in the late Pleistocene and early Holocene is tremendously thought-provoking, for it invites important questions about cultural differences. Presumably North, Central, and South America had similar population densities during this period. Certainly all three regions embraced small geographic spaces with high ecological diversity, and plants that later became cultigens were available for exploiting from the start of human occupation. Why, then, did people south of the Panama Canal choose the path towards sedentism and social complexity, and why did people north of this line elect to remain foragers until much later? 



Archaeology and the Occupation of New Lands

PETER HISCOCK (University of Sydney) gave the keynote presentation at the banquet that closed the Paleoamerican Odyssey Conference. The archaeological evidence he reviewed for the peopling of Australia remarkably resembles that of the New World despite its much earlier date. The first humans must have piloted boats, as yet undiscovered, to traverse a deep ocean trench and enter Australia sometime between 50,000 and 55,000 CALYBP. As in the Americas, early sites in Australia are few and widely scattered, and the ability of archaeologists to track small, highly mobile populations across the vast interior in remote time periods is painfully limited because current data don't support reliable testing of models of early human dispersion. It's a truism that humans wreak environmental change on every area they settle, but, just as in the Americas, it's frequently difficult in Australia to distinguish direct and indirect agency by humans from climate change and other natural agents possibly responsible for the extinction of megafauna. Even the timing of the extinction of individual species is unclear. It's possible, in fact, that some species had already become extinct before humans arrived.

America, were probably used to fashion a wide range of organic tools and clothing made of hide, twine, bark, bone, and ivory. Remains of non-lithic artifacts, however, haven't been found, so the nature of this broad inventory of organic cultural materials remains unknown.

Just as in the Americas, the early record of Australia is one of cultural diversity. Assemblages dating to 35,000–45,000 CALYBP demonstrate that human decoration and regional differences in symbolic expression apparently satisfied the need for a group of humans to inform other groups of their existence, and through rock art and personal adornment to define the boundary of their territory in space and time.

Mind over matter

The similarities and complexities of the archaeological records from Australia, Siberia, and the Americas can only be understood if scientists bring to bear new tools, improved techniques, and a critical mind that is nonetheless open to new possibilities. This theme pervaded all three days of the conference.

Tom Dillehay (Vanderbilt University) argued, on the one hand, for full publication of all purported pre-Clovis sites; accepting Monte Verde II as pre-Clovis in age, on the other hand, shouldn't excuse us from critically examining evidence from other early sites. Experiments that simulate natural and cultural formation processes, such as the trampling studies outlined by **William Andrefsky** (Washington State University), are critical for sorting out the evidence for human occupation from myriad other processes that make and break flakes. Novel techniques, such as the use of different kinds of technologies for imaging the sea floor described by **Quentin Mackie** (University of

Unashamedly biased, Jim Adovasio argues the case for Meadowcroft Rockshelter and other pre-Clovis sites that the scientific community refuses to recognize.



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As in the Americas, in Australia the loss of megafauna precipitated and accompanied other environmental changes that profoundly affected human cultures. Prior to extinction, megafauna populations in Australia may have progressively diminished, thereby compelling humans to diversify their subsistence strategies. Economic diversity inevitably gave way to technological and social diversity as populations grew in number and settled into the landscape. We find evidence for this progression in Australia in early lithic assemblages, which consist of highly standardized unifacially retouched flakes that, like the unifacial industries common in late-Pleistocene South

Victoria), are undeniably essential for finding and investigating early occupations on the Pacific and Atlantic coasts of the Americas.

Important in any of the peopling narratives is time: When were people in the Americas, and where were they on the landscape? **Tom Stafford** (University of Aarhus, Denmark) argued that unraveling the story of the peopling of the Americas will require major changes in how archaeologists approach this question. He cautions archaeologists that they need to look further back in time, to expect much greater diversity in tool form, and to search using much more refined


methods. (To emphasize this final point he praised the DNA work by Dennis Jenkins's team at Paisley Caves in Oregon.) Archaeologists must be much better scientists in diverse disciplines, he insists, if they hope to treat sites and sediments as the non-renewable biogeochemical time capsules they are. Only with a five-fold increase in scientific rigor does he believe that archaeologists will be able to interpret the complex data that hold the secrets of human migration and settlement in remote time periods.

Against this daunting list of new skills for Paleoamerican archaeologists to master, **Rolfe Mandel** (University of Kansas) offered a ray of hope: "Pre-Clovis is elusive, but not so much as Bigfoot."

The language of the speakers varied considerably in diction and volume when it came to the thorny question of pre-Clovis sites. "What might have been reasonable doubt now emerges as obvious," **James Adovasio** (Mercyhurst College) observed in trying to put the final nail into the coffin lid of the Clovis-First theory. "The case for substantial pre-Clovis is at the very least beyond reasonable doubt, if not overwhelming." **Steve Holen** (Center for American Paleolithic Research) argued that archaeologists should "teach students that we don't know when humans entered North America." He pleads for scientists to keep

an open mind and to look at the archaeological record of remote time periods without prejudice.

Michael Collins (Texas State University) was more explicit: "The peopling of the Americas is far more complex than previously thought," he said, "Clovis is the mid-point of the cultural history," coming at the end of 13,000 years of interaction with megafauna. Arguing with even more candor, he noted that we are at an enormously propitious moment. "We've come a long way since the previous Conference," he told the listeners. "We've got to stop this crap that there's nothing older than Clovis." When we next convene a conference in the not too distant future to talk substance, he hopes that "we are talking about Siberian and Iberian diasporas."

Mike Waters (CSFA, Texas A&M University), more conservative in his thinking (he places humans in the Americas firmly after the Last Glacial Maximum), ended the conference on an upbeat note. "We're getting closer to the story," he said, "but the Odyssey continues." When archaeologists next convene in Santa Fe, New Mexico, in another 10 to 15 years, he anticipates that a younger generation will be at the helm, bringing a more exacting science to resolve the key issues in the peopling of the Americas. I hope I'm there to see what exciting new discoveries have been made in the intervening period. 

Looking Back

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II in the temperate rain forest zone of Chile, dated at ca. 14,500 years ago (ca. 12,500 RYBP). Preserved at this site under a peat layer was evidence of dwellings constructed of wood frameworks covered with hides, and artifacts of wood as well as simple stone tools. There was a large variety of plant remains as well as a few bones of mastodon and *Paleolama*; and it is clear that the

Ruth examines the stratigraphic profile preserved from José Cruxent's excavations at Taima-taima in the late 1960s.



inhabitants of the settlement of Monte Verde II were foragers with an excellent knowledge of the resources of the forest, wetlands, coast, and Andean foothills. It was a way of life very different from that of Clovis hunters, and yet significantly older. This discovery has opened the eyes of North American archaeologists to the Paleoamerican world on the southern continent.

Since the year 2000, international specialists in Paleoamerican research have met in a major congress held biannually in a Latin American city. These symposia gather together archaeologists who are currently investigating the problem of the

first entry of humans into the various regions of the Americas, to learn of new discoveries and to discuss new interpretations. Latin American voices are also now to be heard more often at Paleoamerican sessions at the annual meeting of the Society

for American Archaeology, and the Center for the Study of the First Americans has made a strong contribution to the dissemination of knowledge by publishing reports on Latin American early sites. The Paleoamerican Odyssey congress, held in Santa Fe last October, was the forum for presenting a number of papers summarizing the evidence for the initial settlement of various regions of Latin

America, and for exhibiting artifacts from various sites. The unique scenario of Paleoamerican settlement of Latin America is now emerging on the world stage. 

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