

The early prehistory of the Americas and the human peopling of the Western Hemisphere. An overview of archaeological data, hypotheses and models

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Abstract: This article is a general overview of early American archaeology, an updated synthesis of the most important archaeological data and radiocarbon dates concerning the oldest phases of human presence in the Americas, during the Terminal Pleistocene and the Early Holocene. It discusses – in a resumed manner - the most relevant hystoriographical and geographical contexts and academic debates, reviews the existing knowledge on archaeological cultures and sites, lithic technologies and cultural dynamics, and analyses the theories and models that pretend to describe and explain the complexity of phenomena laying at the base of the pristine peopling of the Western Hemisphere. This topic is not well represented in the European archaeological literature and, for that reason, this paper is meant for the Romania/European reader who wants to explore, at a general level, the most important “secrets” of such an exotic subject. The enigma of when people set foot on American lands, at some point during the terminal stages of the Ice Age, has not been solved yet. The chronologies of the earliest migrations, the origins of the first settlers, the demographic expansion models and the relationship between the earliest cultures still represent delicate issues that cause vivid controversies, clashes of paradigms and an immense input of energy and passions among scientists. Independent of the absolute dates, the arrival of the first human groups to that part of the world occurred much later than in Europe, Asia or Australia, perhaps during or after the Late Glacial Maximum, most likely not long before 18,000 years ago, as far as one can tell today. The most common theories suggest terrestrial migration routes starting somewhere in Siberia and crossing the Bering Land Bridge into Alaska and Yukon. In spite of the wide opinions and the increasing genetic data in favour of this hypothesis, there is little archaeological data to support it. Alternative hypotheses were proposed during the last decades, which point at other possible places of origin, such as Western Europe, for the earliest peopling of North America, or the Pacific, for the case of South America. For more than half a century, the traditional archaeology promoted the paradigm known as the “Clovis-first” model, according to which the first American settlers were a sophisticated hunter-gatherer culture known as Clovis, well documented over most of the United States and dated back to at least 11,500 RCYBP. Today, this model is considered refuted and there is increasing evidence in support of “older-than-Clovis” populations, not necessarily related to the famous mammoth hunters, both in North and South America. Some intermediary regions, such as Mexico and Central America, still fail to produce a consistent archaeological record for the earliest periods. Many archaeologists claimed very old radiocarbon dates for the human presence in their respective sites; nevertheless, the widely accepted earliest discoveries do not go further than 15,000 years ago. The peopling of the Americas continues to be today, one century after its beginnings as an academic field of research, one of the most debated and controversial subjects in world archaeology.

Rezumat: Acest articol reprezintă o vedere generală asupra preistoriei timpurii a Americii, o sinteză actualizată a celor mai importante informații arheologice și datări cu C¹⁴ în legătură cu cele mai vechi faze de prezență umană în cele două Americi, în timpul Pleistocenului Final și Holocenului Timpuriu. Aici se discută – într-o formă abreviată – cele mai relevante contexte geografice și istoriografice ale temei și dezbaterile academice în vigoare, se revizuiască cunoștințele disponibile despre siturile și culturile arheologice, tehnologiile industriilor de piatră și dinamica culturală și se analizează teoriile și modelele care caută să descrie și să explice fenomenele complexe care stau la baza populației originale a Emisferei Occidentale. Acest temă nu este obișnuită în literatura de specialitate în Europa și, tocmai din această cauză, articolul de față este adresat cititorului român/european, celui care vrea să exploreze, la un nivel general, cele mai importante “secrete” ale unui subiect atât de exotic. Enigma asupra epocii în care primii oameni au pus piciorul pe pământ american, într-un anumit moment din timpul fazelor târzii ale Ere Glaciare, nu a fost rezolvată deocamdată. Cronologiile celor mai timpurii migrații, originea primilor locuitori, modelele de expansiune demografică și relațiile între cele mai vechi culturi cunoscute încă reprezintă astăzi aspecte delicate care provoacă vii controverse, ciocniri de paradigme și o enormă cheltuială de energie și pasiune printre arheologi. Indiferent de datele directe, sosirea primelor grupuri umane în acea parte a lumii s-a produs mult mai târziu decât în Europa, Asia sau Australia, probabil în timpul sau după Ultimul Maxim Glaciatic, cel mai probabil nu cu mult înainte de 18,000 de ani în urmă, din care se poate spune azi. Cele mai vehiculate teorii sugerează migrații terestre, pe rute care începeau undeva în Siberia și traversau Podul Terestru peste actuala strâmtoare Bering înspre Alaska și Yukon. În pofida opiniilor generalizate și a rezultatelor genetice în favoarea acestei ipoteze, există foarte puține argumente arheologice care susțin. În

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ultimii ani s-au propus teorii alternative, care vorbesc despre alte locuri posibile de obârșie a primilor coloniști preistorici, de pild vestul Europei, peste Atlantic, în cazul populației Americii de Nord, sau dinspre Oceanul Pacific, pentru America de Sud. Pentru mai bine de jumătate de secol, arheologia tradițională a promovat modelul cunoscut ca „Clovis-first”, după care, primii locuitori ai Americii au fost o sofisticată comunitate de vânători-culegători cunoscută sub numele de Clovis, bine documentată pe teritoriul Statelor Unite și ale cărei începuturi datează pe la 11,500 RCYBP. Astăzi, acest model este refutat, în fața unei avalanșe de descoperiri care arată că populații „mai-vechi-decât-Clovis”, nu neapărat legate cu celebrii vânători de mamuți, atât în America de Nord, cât și de Sud. Unele regiuni intermediare, precum Mexicul și America Centrală, încă nu reușesc să ofere contexte arheologice de încredere pentru epocile cele mai timpurii. Mulți arheologi au vrut să arate date foarte vechi pentru prezența umană în siturile lor; însă, descoperirile cele mai favorabil acceptate de comunitatea științifică nu depășesc pragul de vechime de 15,000 de ani. Popularea Americii continuă să fie astăzi, la un secol de la începuturile sale pe scena cercetării științifice, unul dintre cele mai dezbătute și controversate subiecte din arheologia mondială.

Keywords: Prehistory of the Americas, First Americans, Peopling of the Americas, North America, South America, Mexico, Clovis, pre-Clovis.

Cuvinte cheie: Preistoria Americilor, primii americani, popularea Americilor, America de Nord, America de Sud, Mexic, Clovis, pre-Clovis.

◆ Introduction

The early American prehistory is, perhaps, not among the most familiar topics for European readers, either scholars or members of the general public. The monumental and impressive later civilizations of the New World most likely built up a shield of openness that often blocks the access to the more “insignificant” manifestations of culture belonging to the most remote periods of human occupation. Olmec colossal heads in the tropical jungle, Mayan and Aztec pyramids, Andean strongholds and monuments, rich tombs and mysterious hieroglyphs... They all contain enough magic and sufficient power to attract everyone's attention, flooding the mediatic environments, television and magazines. But, all these spectacular cultures, commonly labeled by archaeologists and public as “great civilizations”, trace their remote origins to a handful of settlers who first pioneered the pristine human conquest of the Americas, many millennia ago, at the end of the last Ice Age, coming from a place we cannot assure yet and at a time we still ignore.

This article is meant to be a general introduction, like a very brief textbook, written for those who develop a first interest in the earliest epochs of the human presence on the American continents, for the students and researchers who want to acquire a general knowledge about the ‘state of the art’ in the subject of the earliest arrivals to this part of the world and the earliest stages of cultural manifestations west of the Atlantic Ocean. This paper provides a synthesis on what is currently known about those earliest human occupations in the Western Hemisphere (North, Central and South America) during the Terminal Pleistocene and the subsequent Transition to the Holocene; an interval considered, roughly, between about 18,000 and 10,000 calendar years ago (from now on, cal BP) (figs. 1, 2). This comprises the time span between the end of the Last Glacial Maximum (at the end of the so-called Wisconsin glaciation, the North American equivalent of the European counterpart traditionally known as Würm) and the establishment of the current climatic conditions in the Early Holocene, during which the ancient prehistoric American cultures appeared in the archaeological record, transformed over time and space, before being replaced by the later manifestations commonly called “Archaic” (fig. 3).

This paper does not pretend to be a full discussion of the topic and it could never be anything more than an incomplete and general survey of the current knowledge. The archaeological record is simply overwhelmingly rich in data and it cannot be dealt with in a journal article. The reader can find a bounty of detailed information on the theme in a wide array of synthetic publications written by renowned authors (R. Bonnichsen, K.L. Turnmire 2005b; T. Dillehay 2000; E.J. Dixon 1999; B. Fagan 2004, 2011; S. Fiedel 1996; D. Meltzer 1994, 2009; D. Stanford et alii 2005, etc.). The discussion here strictly embraces the most sounded cultural components of the archaeological record. Because of obvious space limitations, it is not possible to properly venture into the fields of palaeoenvironments, palaeoclimatology, linguistics and genetics. It rather focuses on archaeological sites, artifacts, human remains and subsistence patterns, emphasizing the radiocarbon ages available.

I agree with David G. Anderson (2005) on the necessity to employ (when possible) calibrated dates, at least when doing macro-regional interpretations and continental comparisons of data; at least for North America, as the calibration curves for the Southern continent are still insecure. The

discrepancy of 1500-2000 years between the radiocarbon values and the actual calendar years - complicated by still insufficiently known fluctuations of the ^{14}C isotope atmospheric reservoir during the considered interval (cf. D.H. Mann et alii 2001) - could play tricks on the understanding of the real manifestations of the early human cultures in time and blur the results of comparisons at a continental level. Nevertheless, this text prefers to employ “radiocarbon years before present” (RCYBP) and introduces calibrated values only when provided by the cited authors in their publications. It is very important to warn the reader about a crucial detail: calibrated dates (calendar years) are expressed here as “cal BP”, as they are always managed in the American prehistory, meaning “calendar years before present”, so they should not be understood as “cal. B.C.” (not “before Christ”). Specific cultural-historic frames are also avoided, yet making use of already established names of archaeological cultures and complexes. Such models can be mentioned in the text, but there is no formal commitment to any, for reasons of objectivity.

Inevitably, this paper is somehow closer to the cultures, issues and controversies manifested within the North American archaeology, particularly the United States of America, a region better known by the author. On the other hand, the Mexican territory receives some particular treatment from place to place in this article, as the author of these lines has been working in Mexico for several years so far. Certain equilibrium between the northern and southern parts of the Western Hemisphere was an ideal goal of this text, but, if that was not achieved, I apologise to the readers who felt disappointed.

◆ A few words on geography, terminology, time frames and American Pleistocene

The overall geographical settings for the regions discussed here are probably familiar to the majority of the readers. However, a few short considerations may be required, especially concerning the delimitations of large geo-cultural areas. In the first place, the two Americas, North and South, are assumed - by almost everybody in the Western Hemisphere - as two different continents; that is why one is expected to refer to them as “the Americas”, in plural. Few people may have doubts about where South America begins; it commences, as a continent and geo-cultural “latin” entity, at the Panama Isthmus in the north and it has a well-defined contour all around its oceanic shores. Things are not that easy with North America though. Not only the general public, but scholars themselves, use to conceive North America as limited to its northern, mostly English-speaking half, meaning the United States of America and Canada, up to the frozen Alaska and Yukon regions in the northwest, where the “western world” meets Russia at the Bering Strait. For some reason, people forget to include Mexico. Curiously, almost everybody outside Mexico tend to locate this country in Central America. Now, strictly from a geographical point of view, Central America does not exist as a separate continent. It is only a geo-cultural sub-division of North America, perceived on the basis of linguistic arguments: that diffuse region full of jungles where everybody speaks Spanish. Then, in the eyes of the public, as a Spanish-speaking country, Mexico must be part of Central America. That is wrong even from the most liberal cultural-geographical perspective. Mexico is an inseparable part of North America; its geology, climate (in most of its regions), and even its prehistoric archaeological record link it strongly to North America. The reader should know that the landscape changes east of the Tehuantepec Isthmus, where Mexico narrows just west of the Yucatan Peninsula, becoming clearly more similar to Central America in climate, precipitations, flora and fauna. So, if one was to establish continental subdivisions elaborated on climatic and biological criteria, Mexico’s Yucatan and Chiapas regions would indeed belong to the Central American sphere of influence. But, as such divisions on top of divisions would turn things even more complicated, it is convenient to assume Mexico as part of North America, alongside the US and Canada. It is probably worth specifying here that, in this text, the word “America” refers to an entire hemisphere, not only to one country, as most inhabitants of the United States are used to understand it.

This is not the appropriate place to start a long discussion about the general environmental conditions, causes and processes that characterised the Pleistocene epoch, also known as the Ice Age, an era that started 2.6 million years ago (figs. 1-4). Brian Fagan (2009) edited a splendid and beautifully illustrated introduction to the subject, for those interested. However, the non-specialist reader should know a few general facts about how the Americas looked like during the last major glaciation (only the last one in a long series of alternating cold and warmer periods comprised within the Ice Age) (fig. 2).

First, as it is widely known, during the glacial period most of the water on planet Earth was trapped in the glacier caps around the world, meaning that the ocean levels were about 100 m lower than today, exposing large portions of the continental shelves, according to the particular topography of each coast. In consequence, the contours of the Americas were slightly different from today, differences made more visible on the Atlantic shores and less pronounced on the opposite coasts where land drops more abruptly into the sea (fig. 4). That means that archaeologists today can hardly have access to the ancient shorelines and their corresponding archaeological record; a permanent bias in the debates over the earliest human arrivals and migration routes. Second, as sea levels were low, Alaska and Siberia represented a single landmass, known by archaeologists as Beringia: the famous Land Bridge supposedly used by the first settlers to move from Asia to America, according to the most widely accepted peopling models. Third, and curiously, during the Ice Age, Alaska was ice-free, covered by wide-open grasslands suitable for large herds of herbivores, with subarctic forests and rivers rich in resources. Fourth, enormous ice caps covered the entire northern half of North America. On the west, along the Pacific coast, a narrower ice sheet (known as the Cordilleran ice sheet) covered the entire Canadian coast and penetrated into Washington and Oregon in the current USA (United States of America). Almost everything else known today as Canada was covered by a second massive ice sheet (the Laurentide ice cap), about 3 km thick, whose southern margins reached the latitudes where today the American cities of Chicago and St. Louis are located (fig. 4). During most of the Pleistocene - until late at the very end of that chronological interval - these two ice sheets were completely stuck together, forming an endless, impenetrable, lifeless polar desert. This is a very important "detail", as the idea of a human pristine colonization by foot from Beringia, through an inland route leading to the vast grasslands south of the ice sheets cannot be taken lightly and as a self-evident fact (fig. 26).

It is necessary to mention the different perception we have of the idea of "antiquity" in the American prehistory. The time frames are compressed on this side of the world, in comparison to the European scales. For Old World scientists, archaeological finds of tens or hundreds of thousands of years of age are normal facts in everyday's academic life. Not so for us, in the Americas. Here, the battles are still harsh around every single new radiocarbon date. The infancy of the archaeological quests on prehistoric grounds has not reached its end yet. The Holy Grail of the American archaeology has not yet been found: when did the very first people enter the continent? Where did they actually come from? Before diving into more sophisticated matters about the first hunter-gatherer societies of the continent (social organisation, cultural behaviours and so on), archaeologists in the Americas are still struggling to find a definitive answer to these primordial and fundamental questions. This paper is trying to show how complicated and fierce the controversies still are around this crucial subject.

Unlike many other regions in the world the European reader may be more familiar with, in most parts of the Americas the "Stone Age" lasted for millennia until very recently, in some cases up to the European invasions and, regionally, long after that. Few cultures developed substantial metallurgy and most tools represented in the archaeological record are made of flaked stone (cherts, obsidian, basalt, rhyolite, limestone, quartz), almost regardless of the time period they belong to. Stone tools were still in use all over the hemisphere only a couple of hundreds of years ago, well after the establishment of the modern countries founded by the descendants of European colonists. Also, simpler societies of hunter-gatherers dominated entire regions of both American continents and continued to do so at the same time with the uprising of formidable states and empires inside more complex cultures. This historical and anthropological reality renders the task of identifying the first human occupations a difficult one, not suitable for superficial evaluation and a priori assumptions. For example, the discovery - let's say, on the surface - of crude, "primitive"-looking stone artefacts is no guarantee in itself for the presence of early hunter-gatherer groups, as they could belong to any epoch, in theory. Only the thorough knowledge of the technological patterns of stone flaking for each particular prehistoric culture and the direct dating of archaeological finds and sedimentary contexts would provide the scientist with the adequate basis for the identification of the pristine human occupations and the earliest migrations of human groups across the continent. Unfortunately, this is not always the path some of our colleagues choose to follow; sometimes, inferences are made and conclusions drawn upon superficial attributes of artefacts, general impressions, weathering and visual aspect of the stone tools, shapes and contours, ignoring the fact that, during 15,000 – 18,000 years (or more) of possible human presence on the continent, manufacture fashions and stone tool shapes could have returned periodically at different points in time. In the Americas, where thousands of societies employed stone tools for such a long time and over such vast territories, only very rigorous

technological analyses and absolute dating can make the difference between science and speculations.

Another unfriendly factor that affects the prehistoric research in some regions of North America (for example, precisely Northern Mexico where I conduct my own research on early human occupations) is the poor stratigraphy. Whether in many parts of the United States the earliest phases of human presence are buried deep into dark soils, beneath later, Archaic strata (meaning Middle to Late Holocene; fig. 3), in the desert areas situated at high altitudes the sedimentation is very slow, inconsistent, and sediments simply cannot accumulate due to high erosion rates. That leads to a veritable nightmare for prehistorians: artefacts from all possible periods cluster together on the surface or at very shallow depth, erasing any hope for a stratigraphic control. Also, cultural features are diffuse, with very low potential for identification through remote sensing or aerial surveys (C.F. Ardelean, J.I. Macias 2012). Nevertheless, more as an anecdote, the reader should know about an unofficial trick archaeologists in the Americas use to employ. It is believed that bow and arrow were a later arrival to the continent, at an unknown point during the Holocene (at least, there are no indicators to think otherwise), while the preferred weapon in the earlier cultures was the spear, bearing larger stone points, thrown with an "atlatl" or spear-thrower. In consequence, larger stone points are considered of higher probability of being older than the small arrowheads, which are assumed to be younger. Many of us used to employ this basic criterion for an initial sorting of artefacts. However, future discoveries may well prove us completely wrong.

Finally, terminology is another matter worth mentioning in relationship to American prehistory, especially if one confronts literature from different countries. We cannot actually refer to an "American Palaeolithic", not without risking generating unfortunate confusions. The term is dangerous. The history of archaeological research on the earliest inhabitants of the Americas knew very tense moments when very old, unsustainable dates were alleged for the initial peopling of the continent or when - at the opposite end of the spectrum - skepticism manifested rigidly around almost any single radiocarbon date that dared to challenge the conservatory thresholds accepted by the dominant paradigms. So, referring to a Palaeolithic epoch in the Western Hemisphere would create an unwanted parallel with the Old World chronologies and, perhaps, too much legitimacy for the pseudo-scientists and enthusiasts who like to speak of the presence of humans beyond any scientific fundamentals. Most specialists working on this topic in the Americas reject the employment of this term. Until recently, the most widespread word used for the earliest hunter-gatherer societies was "Paleoindian" – obviously, in the literature written in English. Frank Roberts first employed this term in the 1930's and it implied certain links between the Pleistocene and the Holocene, because it referred to archaeological cultures that extended, chronologically, over both the Terminal Pleistocene and the Early Holocene (R. Bonnichsen 1999b, p. 2). In the United States of America, mainly, people inherited this word, "Indian", from the colonial times, naming the local indigenous populations. Native tribes, to a certain level, also adopted the label to name themselves in their interactions with the "white men". But that was not the case in Mexico and most of Latin America: the word *indio* has always been considered offensive, as it had been used for centuries as a synonymous for social and race inferiority by the Spanish chronicles and Colonial documents, soon turning pejorative. In consequence, the term was never welcome in the academic writing of Spanish language (C.F. Ardelean 2013). During the last decades, the use of "Paleoindian" diminished and it almost disappeared. Today, the most common term to name the earliest phases of human development in the Americas is "Paleoamerican" (or "Paleoamericano", in Spanish), relatively recently introduced by R. Bonnichsen and considered to be a neutral and "a more descriptive geographical term", without any political implications (*ibidem*). It basically refers to "any humans predating 8000 RCYBP (about 10,000 cal BP), associated with cultures identified as Paleoindian, Early Archaic, or Paleoarchaic" (J.C. Chatters 2010, p. 54).

◆ The childhood of the North American prehistoric research

By the mid-nineteenth century, the eccentric Swiss geologist Louis Agassiz proved the existence of an Ice Age in Europe and pleaded for its manifestation at global scale. Later, he was offered a position at the Harvard University in the US and from there he boosted the commencement of the glacial studies in North America. By the end of the century, other scholars, such as Thomas C. Chamberlain, defined the first accurate maps of the Pleistocene ice caps and labeled the stadials (cold intervals) and interstadials (warmer phases) that composed the North American Ice Age (see B. Fagan 2009) (fig. 2). This way, during the initial decades of the twentieth century, scientists in the United

States were well aware of the existence of a recent, long cold period in the geological history of the continent and of now-extinct animals roaming a different landscape in the past. However, the coexistence of humans and extinct fauna, the existence of the "Glacial Man" in the Americas was not at all a certainty and it remained in doubt for a long time, until speculations and individual passions could be replaced by hard evidence based on archaeological data obtained under controlled scientific conditions (for a comprehensive story of the advent of prehistoric archaeology in the Americas, see B. Fagan 2004; J.M. Adovasio, J. Page 2003).

During most of the eighteenth and nineteenth centuries, academics could not accept the idea that local "primitive" native populations could have been able to create the monumental earthworks in Eastern USA or the large stone monuments of Mexico. Just like it happened in the case of "black" African archaeology, those achievements could only be attributed to white migrants from the Old World, perhaps Phoenicians, Greeks or survivors of a mysterious Atlantis lost continent. Since the sixteenth century, J. Fredericus Lumnius had declared that the ancestors of the modern "Indians" must have been the Ten Lost Tribes of Israel, once exiled by the Assyrians. Such ideas grew on fertile grounds for a long time and they even survive today in the religious beliefs of Mormon sects and inside the troubled minds of pseudo-scientists. In spite of the first academic approaches and the first amateurish excavations realised on the impressive earthen mounds of Eastern USA during the second half of the nineteenth century, few scholars accepted a local origin for the ancient cultures. Eventually, things changed slowly towards the end of the nineteenth century; especially after Stephens and Catherwood 'discovered' the Mayan lost cities in the Mexican and Central American jungles in the 1840's and pointed at their obvious local attributes. Nevertheless, the harsh controversies moved to another ground: the antiquity of Man in the Americas.

During the last decades of 1800's, North America started to feel the influence of the Palaeolithic discoveries in the Somme Valley of France. Boucher de Perthes had begun his archaeological revolution that set the basis for the study of prehistoric people and their ways of life during the Ice Age. Was there a "glacial Man" in America, as well? A handful of scholars were convinced that there was; unfortunately, it was not long before the arguments they contributed proved wrong. Charles Abbott was a physician from New Jersey, a passionate of natural history who loved to collect crude, old-looking stone artefacts from the riverbanks in northeastern United States, advocating for a deep antiquity of humans in the region, probably of the same age like the newly discovered artefacts in Europe. Frederick Putnam, the well-known director of the Peabody Museum at the University of Harvard, who had the same faith in an American Palaeolithic, influenced him. Soon, enthusiasts were searching for the so-called "palaeoliths" all over the countryside. In 1887, the 'Palaeolithic controversy' started officially with Thomas Wilson, a curator of archaeology at the National Museum, who had just returned from a five-years collaboration in European Palaeolithic excavations. He brought those ideas with him and, through official documents from the Smithsonian in Washington D.C., he invited people around the country to collect and deliver old-looking stone tools to the prestigious institution. If artefacts looked like something in the European Palaeolithic, that was a proof for an American Palaeolithic of similar antiquity. That was the beginning of a paradigmatic fight that, in a modified form, continues today: the antithesis between an enthusiasm for old dates and very old human occupations, on one side, and the skepticism, criticism and rigid scientific scrutiny, on the other side.

In contrast with the initial enthusiasm fed by the large numbers of "palaeoliths" collected on the field, a new paradigm was born soon enough: human presence was only a few thousand years old in the Western Hemisphere, at least for North America; perhaps only 2000 to 4000 years old. At that moment, the new official theory was not built up simply on sectarian controversies, but on a scientific analysis of the alleged palaeoliths. An influential character at the Smithsonian Institution, John Wesley Powell, commissioned William Henry Holmes to investigate the fundamentals of the Palaeolithic euphoria in the USA. Holmes studied the incoming artefacts, visited the sites they came from and quickly reached the conclusion that they were not at all finished tools indicating remote occupations, but the flaking debris (cores, flakes, preforms) from arrowhead manufacture of very recent times. He even proceeded to experimental flaking in order to support his posture. Holmes struck a hard blow to the "liberal" opinions in American archaeology and gave birth to the new official attitude: skepticism. A few years later, at the beginning of the twentieth century, a Czech-born physical anthropologist, Aleš Hrdlička, joined the Smithsonian and became the fiercest guardian of the skeptical position. Using osteological comparisons and rigidly controlling the field discoveries around the country, he maintained for a long time the strict idea that the archaeological record lacked any arguments in favour of an Ice Age human occupation.

Hard archaeological indicators commenced to show up in USA during the interval between the two world wars. Since 1908, a local black cowboy named McJunkin, from a remote village called Folsom in the northeast of the State of New Mexico had found old bison bones and a few curious flaked stone artefacts (spear points) eroding out of the banks of a small creek (fig. 19). After seventeen years in the man's house, the small collection reached the Colorado Museum of Natural History, where its director, Jesse Figgins, quickly recognised in it the bones of an extinct species of bison, a Pleistocene variety. Could they have been associated in the same context? In 1926, Figgins started his excavations at the locality where McJunkin had made the initial discovery and found another stone point indeed associated with bison bones. He took the artefact to the Smithsonian, but a find removed from its context did not produce a positive effect on Aleš Hrdlička. During the 1927-1928 field seasons, Figgins was careful enough to leave all the newly discovered artefacts in place, so that other scholars could visit the site and witness themselves the association between man-made stone tools and an extinct form of bison. Although Hrdlička continued to be skeptical, the academic community now accepted the undeniable stratigraphic association of finds and the contemporaneity between people and extinct Ice Age beasts. That became a normal practice (even today) in the early prehistoric sites of the Americas: the doubts among colleagues are so high that, if you want to be believed by your peers, you need to organise visits of influential archaeologists to your controversial sites and allow evidence to be validated by others. With Figgins' work, the Folsom archaeological culture was born and the antiquity of Man in North America suddenly moved back 6000 more years, somewhere around 10,000 B.P., as it was guessed for long by the archaeologists before the invention of radiocarbon dating (figs. 11/H, 18).

Only a few years later, another locality, situated in the same State but southwards, came to erase any doubts on the existence of the Ice Age Man on this side of the Atlantic. In the early 1930's, a new road was being built between two small towns, Clovis and Portales, set not far apart. A quarry was opened near Portales, along a shallow creek named Blackwater Draw, in order to extract gravels and sands for the construction (fig. 9). A few boys from neighbouring Clovis town found the first lanceolate, fluted points that later would be called after their town (the daughter of the train station keeper at Clovis re-baptised the place with this name just because she loved to read books about the Frankish king, Clovis) (figs. 6-7). The history of the research there is long and complex (see L. Katz 1997; A.T. Boldurian, J.L. Cotter 1999). The site was also rich in Folsom period contexts, mainly a massive bison kill site at Locality 1, which started to be excavated in 1932 (fig. 10). Later, for years and years to come, especially during the pioneering work of 1949-1951 seasons, Blackwater Draw yielded several localities in which new Clovis-type artefacts were found in direct association with mammoth bones, clearly beneath the Folsom levels. Clovis culture proved to be stratigraphically older than Folsom. A few years later, the first archaeological samples to be tested by Libby's new radiometric dating method were precisely from Folsom and Blackwater Draw, confirming the ages estimated by archaeologists. In the eyes of academics and public, Clovis soon became the iconic manifestation of the "First Americans", associated with the mythical migrants that supposedly crossed the famous Beringian Land Bridge, those who subsisted on mammoth flesh and made stunning spear points. And the "Clovis-first" model stood like that, impenetrable, for half a century.

In Mexico, things went on a different path. Mexican archaeological environment evolved completely apart and separated from the effervescence on the North American stage alluded above (C.F. Ardelean 2013). Traditionally, Mexican archaeologists, mainly the prehistorians, used to keep very little contact with their neighbours across the border. In fact, the lack of communication was mutual, the USA side constantly ignoring (even today, with very few exceptions) what happens south of their border. Poor conditions for international cooperation, political and nationalistic adversities, anti-USA or anti-Mexican feelings largely contributed to this prolonged divorce. Paradigms were different, almost opposite. On the other hand, prehistory and early human occupations were never priority subjects in a huge country completely paved with massive pyramids and gigantic urban centres left by the Mesoamerican civilisations. The weight of individual persons (through their political and academic influences on colleagues) marked the pace in the development of the discipline in this Latin American country.

The birth of an academic prehistoric archaeology in Mexico occurred much later than in the United States, at the end of the 1940's and early 1950's. Like elsewhere on the continent, the Colonial times had produced a variety of opinions about the origins of native populations and the possible entrance routes into the New World, a theme too vast to be debated here (see C.F. Ardelean 2013; E. Matos 1987; A. González-Jácome 1988). For centuries, people in the countryside and workers building urban infrastructure in the capital city used to unearth "giant bones" (the popular term for

megafauna remains), but there was no formal, institutional interest in the dawn of humanity and no stone artefacts were still found in association with extinct animals. By the end of the nineteenth century, geologists had already identified, to a certain level, the Pleistocene stratigraphy in the Basin of Mexico and scholars were familiar with the greenish, bentonite Becerra Formation. The excavation of a drainage system at Tequixquiac, northeast of Mexico City, allegedly produced a curious artefact: a camelid pelvis bone sculptured in the shape of an animal head (M. Bárcena 1882 [1987]; L. Aveyrya 1965) (fig. 27). That was the first signal that drew the attention on the “Early Man” in Mexico, but controversies about its stratigraphic position and artificial nature persist today. In the 1940's, a US archaeologist, Helmuth De Terra, started the first systematic search for the earliest inhabitants of Mexico and his excavations at Tepexpan (not far from Tequixquiac) suggested an association between a human burial and mammoth bones (H. De Terra 1946, 1947, 1951, 1947 [2010]; H. De Terra et alii 1949). Today, we know that he missed the stratigraphic details of the site and the radiocarbon dates proved the burial to be of later Holocene age, but De Terra's work launched the quest for the Ice Age people south of the US border. The sediments and macroscopic remains he collected for radiocarbon dating – in spite of not being stratigraphically related to the discovery itself - were the first Mexican samples ever dated by the newly invented technique (H. De Terra 1951). At the same time, Richard MacNeish commenced his own investigation in northeastern Mexico, in the caves of Sierra Madre Oriental (R.S. MacNeish 1958, 1948 [2009]).

For the last 70 years, archaeology in Mexico was under the control of one institution, the National Institute of Anthropology and History (INAH, by its Spanish initials). INAH is the maximum authority in the matter today and it controls, legally and academically, everything done in archaeology throughout the country. In 1952, the Institute opened its short-lived Prehistory Department and, magically, the same year, a mammoth double kill-site was discovered at Santa Isabel Iztapan, basically in the same area like the previously-named sites of Tequixquiac and Tepexpan (today in the vicinity of Mexico City, some by the international airport and some close to the famous pyramids of Teotihuacan) (fig. 27). The two specimens were found in a Pleistocene lacustrine environment, associated with a great diversity of stone tools, mainly spear points of different types (L. Aveyrya, M. Maldonado-Koerdell 1952, 1953, 1956). Always presented by the official archaeology (still today) as the landmark of national prehistory, the now-disappeared site at Santa Isabel Iztapan contains too many enigmas and unmatching pieces that generate doubts about the actual finds (C.F. Ardelean 2013). South of the Basin of Mexico, in the same period of 1950's-1960's, near the city of Puebla, an amateur prehistorian, Juan Armenta, had been gathering fossil bones and flaked stone materials from exposed lacustrine and gravel deposits at Valsequillo, a place meant to become one of the most controversial sites in North America (fig. 29). Institutions from the United States eventually became fully involved in systematic explorations around the Valsequillo basin and so did INAH for a short time at some point (J. Armenta 1959, 1978; C. Irwin-Williams 1967, 1981; C. Irwin-Williams et alii 1969; V. Steen-McIntyre 2006; V. Steen-McIntyre et alii 1981). The discoveries there - still blurry today and too much affected by stratigraphic controversies, international disputes and the lack of peer validation on site - gave a strong impulse to the development of a passionate and competitive search for the earliest inhabitants of Mexico. The main character in INAH in those years was a Spanish-born archaeologist, José Luis Lorenzo, a communist refugee of the Spanish Civil War and fierce adversary of the investigations and allegations of antiquity contributed by the USA teams at Valsequillo. Lorenzo dominated and still dominates the official paradigms in the Mexican prehistory through a chronological model he created, a particularistic and poorly fundamented scheme that has little to do with the actual empirical reality (J.L. Lorenzo 1967). Lorenzo and his team opened a new site, roughly in the same region, at the foot of a volcanic hill in Tlapacoya, where an ancient occupation of 20,000 years was soon to be announced (J.L. Lorenzo, L. Mirambell 1986, 2005; L. Mirambell 1973) (figs. 27-28). Myths were about to be born, based on this and other sites. The desire to provide proofs of very old human presence in Mexico, older than those accepted in the United States was not the healthiest influence on the accuracy of data produced by the Mexican projects in those decades. El Cedral, in the state of San Luis Potosi (not far from my own study area), was another locality that, since the initial reports in the 1970's (J.L. Lorenzo, L. Mirambell 1981, 1984) and until the very recent final publication (L. Mirambell 2012), maintains certain level of doubts and confusions about the validity of the data and the radiocarbon dates of more than 30,000 years claimed for the human presence there (fig. 27). However, in spite of such controversial aspects, the prehistoric investigation in Mexico was already well on its course and some of the explorations produced extremely valuable data that may contribute to the shallow understanding we have today on the earliest human occupations in the Americas. Nevertheless, unlike the United States of America, Canada or South America, where so many

specialists dedicate their efforts to the earliest periods of human history, in Mexico only a handful of archaeologists prefer this delicate field of research, most of our colleagues getting involved in the study of the monumental, Mesoamerican settlements.

◆ Mile Zero: the Clovis culture

Independent of how old the earliest radiocarbon dates will turn out in the future, the best known integrated prehistoric archaeological culture of Late Pleistocene Americas is Clovis, which maintains as an obliged point of reference. In the common language spoken by archaeologists of these latitudes, everything earlier than a conventional time-marker set at 11,500 RCYBP is usually called "pre-Clovis" and everything after Clovis' end (around 10,800 RCYBP, right at the onset of the Younger Dryas climate reversal) is labeled "post-Clovis" or "Late Paleoamerican". Clovis remains today the 'mile zero' from which North American archaeological reality is measured.

As it was said above, this culture was first defined in 1932 at its type-site, Blackwater Draw, in New Mexico, United States (figs. 5, 9-10), where the first diagnostic projectile points were found in stratigraphic context and in direct association with extinct mammoths (see A.T. Boldurian, J.L. Cotter 1999) (figs. 6-7). The discovery was soon followed by many other finds, mainly proboscidean kill sites (more visible in the field than simple open camps), and the characteristic concave-based and fluted stone bifaces defined as the "Llano complex" which later became better known as Clovis (E.W. Haury et alii 1959) (fig. 5). Since the initial find, and for the next five or six decades, Clovis and the American mammoth (*Mammuthus columbi*) turned into the heraldic image of the Pleistocene human occupation. A strong paradigm was rapidly adopted in the North American academic environment, known as the "Clovis-first" model. The model implies that this culture was the archaeological manifestation of the very first and only pristine population to migrate into the New World, through the Bering Land Bridge, formed between Siberia and Alaska when the ocean's levels were more than 100 m lower than today (fig. 4). They moved fast and restlessly and peopled the entire hemisphere in less than a millennium, giving birth to all the other Pleistocene cultures in that part of the world, supposedly including the South American ones. A strong pillar of the paradigm was the so called "Overkill" model: humans, once arriving in the Americas, specialised in Ice Age megafauna and drove several taxa to extinction, causing instability in the ecosystems and endangering many other species (P.S. Martin, H.E. Wright 1967; P.S. Martin, R.G. Klein 1984; P.S. Martin 1984) (fig. 26). Such a theory, emphasising an unlikely highly specialised economy obsessed with megafauna, is being refuted by new data.

With many archaeological sites across the United States and parts of Canada (but no so in Mexico!), Clovis became a well-defined horizon, with a strong epistemological advantage over other discoveries that since the 1970's have been trying to claim older and culturally different human occupations (R. Bonnicksen 1999b; G. Haynes 2002; G. Sánchez, J. Carpenter 2003; D. Stanford et alii 2005; L.F. Bate, A. Terrazas 2006; S. Fiedel 2006a, 2006b). This situation is still valid in Mexico, where the only securely dated old occupations belong to this horizon. The recently discovered proboscidean kill-site at El Fin del Mundo, Sonora, is the only well-dated Clovis site in Mexico (G. Sánchez 2010; G. Sánchez, J.P. Carpenter 2012; G. Sánchez et alii 2007, 2009a, 2009b) (fig. 27). But, with a handful of specialists still defending the idea that Clovis was the only demographic wave to first people America (S. Fiedel 1996, 2004, 2005, 2006a), today there is a consensus about both concomitant and earlier-than-Clovis cultural presences in the hemisphere (figs. 15, 23).

Clovis culture is known for its diagnostic bifacial projectile points, lanceolate in shape, with a more or less concave base, sometimes slightly out-flaring ears, displaying basal thinning and consistent grinding of the base and lateral edges towards the proximal end (figs. 6-7). Their most famous feature is the "flute" or "channel". This means that the biface shows a pronounced longitudinal flake scar on one or both sides, extracted from the base, after the setting up of an isolated platform carefully prepared for that purpose. Whether related to hafting techniques or ritual and symbolism (cf. B.A. Bradley, M.B. Collins 2013), the flute remains consistent across early North America, found also on non-Clovis artefacts (figs. 11, 16). Not all Clovis bifaces are fluted and not all the fluted unstemmed points are necessarily Clovis. What defines the culture is not the fluted point, but the highly complex lithic technology expressed in the rich artifactual assemblages (fig. 8). The presence of these people can be detected by identifying a series of very specific signatures in the flaked stone materials. The high incidence of biface thinning flakes, a proper blade industry using prepared wedge cores (fig. 8/D), biface cores to be used both as transportable raw material for blades

or as blanks for bifaces, flake cores, careful preparation of platforms, a consistency in the so-called "overshot" (or *outrépassée*) flakes, as part of the reduction procedures, are only some of the typically Clovis features (M.B. Collins 1999; B.A. Bradley et alii 2010).

The Clovis point was a lethal weapon (both projectile and knife), designed to penetrate and cut, to resist impacts and cause fatal bleeding, meant to go deep into the prey's body, made to be glued with pitch in notched shafts and wrapped around with sinew over the ground edges (B.A. Bradley et alii 2010; A.T. Boldurian, J.L. Cotter 1999; G. Frison 2005). It was a valuable possession, extensively reworked and rejuvenated before discarded. Clovis people manifested special preference for exotic raw materials. The common stone was chert, but they often procured fine-looking materials from hundreds of miles away, such as transparent quartz, translucent agate, chalcedony, jasper, and banded or colourful cherts. Such objects must have had social, symbolic or ritual meanings (D. Meltzer 2002). The use of rare materials could either mean large territories, interregional trade or social ties meant to bond distant groups. Such finely crafted artefacts often appear in caches deposited in shallow pits in the ground (G. Frison, B.A. Bradley 1999; M.B. Collins 1999; B.B. Huckell, J.D. Kilby 2014). Were they ritual offerings or safety boxes? Sometimes, the lithic inventory is burned (D.B. Deller et alii 2009). Some cases, such as the Anzick child burial (Montana, US), show intensive use of ochre powder spread on objects.

The rest of the Clovis lithic assemblage includes large bifaces, blade cores, blades used as tools, blades used as blanks, end and side scrapers on blade and flake, burins, graters, adzes. Clovis people also worked bone and mammoth ivory in the form of scarcely represented artefacts. The art and symbolic expressions are scarce. In spite of the attempts to relate some engravings with >11,000 RCYBP occupations by experimental varnish dating (A.M. Tratebas 2004), there is no secure parietal art yet associated with early occupations. But Clovis people incised small limestone slabs with hatched patterns, such as those found at the Gault site, Texas; a tradition that continued into Archaic times (L.B. Davies et alii 2009) (fig. 8/C). Increasingly accepted evidence is the engraving of a proboscidean on a mineralised bone at Vero Beach, Florida (B.A. Purdy et alii 2011). Most of the "classic" Clovis occupations concentrate in the centre and southwest of the United States, where the states of Arizona (mainly the San Pedro Valley) and New Mexico offer the most important groups of kill-sites of large mammals, while Gault is the largest habitation camp known so far (D.S. Byers 1954; H.T. Wright, W.B. Roosa 1966; G. Frison, B.A. Bradley 1999; G. Haynes 2002; B.B. Huckell 2004; B.B. Huckell, J.D. Kilby 2009; M.B. Collins 1999, 2005; G. Frison 2005; D. Stanford 2005; R. Bonnicksen 1999b; C.V. Haynes, B.B. Huckell 2007; D. Meltzer 2009; M. Waters et alii 2011; B.A. Bradley et alii 2010) (fig. 5).

In spite of apparent unity, there is a substantial variation inside this cultural horizon (J.E. Morrow, T.A. Morrow 1999). In fact, the most intense presence seems to occur in Eastern North America, east of Missouri and Mississippi rivers, where the variability of artefacts actually defines distinct cultural traditions, with different and probably non-Clovis patterns (fig. 11). Nevertheless, whether pioneers or newcomers, Clovis spread very quickly all over the continent and many other groups adopted aspects of their culture; "the Ice Age equivalent of the spread of Coca-Cola or baseball caps", as T. Dillehay says (2000: xvi).

There is a recent and very interesting posture meant to explain the sudden appearance of Clovis in the North American archaeological record, proposed by B.A. Bradley and M.B. Collins (2013). The hypothesis is based on the concept of cultural revitalisation (and derived "revitalisation movements"), an anthropological product rarely applied to archaeological interpretations. This model describes a succession of steps that a cultural system follows in order to improve and turn more satisfactory in front of stresses received by human groups from either environmental or cultural stimuli. In my opinion, it interestingly parallels, somehow, the same mechanisms described by Thomas Kuhn (1962) for the decline and fall of paradigms within the model of 'scientific revolutions'. For Bradley and Collins, the role of the 'steady state' was played by the pre-Clovis populations of Eastern North America, originated in the Western Europe Upper Palaeolithic and living in proximity to productive coastal environments of the Late Pleistocene. With the deglaciation, sea levels rose, ecosystems lost productivity and large herbivores disappeared, deriving into factors of stress or pressure for the established cultural systems. In front of challenges menacing the survival and continuity of the groups, a cultural revitalisation is required, in order to produce adjustments that would render the system satisfactory in coping with the new conditions. Perhaps, a visionary person, a shaman or prophet, took the initiative and proclaimed a return to ancient values, maybe to myths, beliefs, customs and latent baggage of behaviours brought from their place of origin. By preaching and spreading these ideas, a 'new order' was settled and new cultural practices entered in vigour in

an almost sudden way, including the fine flaked stone technology that defines Clovis in the archaeological record.

But how old is the Clovis culture? These people showed up suddenly around 11,500 RCYBP and vanished from the archaeological record right at the end of the Younger Dryas cold event, in the middle of a serious drought, around 10,800 RCYBP or slightly later (C.V. Haynes 2005, 2006, 2007). D.G. Anderson (2005) situates them in his Middle Paleoindian phase, during the Allerød warm period. Roughly, in calendar years, their era was 13,500-13,000 cal BP (S. Fiedel 2004). The chronology varies widely in the literature, according to the region, site and changing accuracy of dating techniques. Numbers cluster between 11,400 - 10,600 RCYBP (J.E. Morrow, T.A. Morrow 1999; A.C. Roosevelt et alii 2002; D.G. Wyckoff 2005). The most recent re-evaluation of Clovis' radiocarbon dating concluded its duration was even shorter, between 11,050 and 10,800 RCYBP (M. Waters, T. Stafford 2007).

Mexico does not count with a consistent Clovis occupation. Some isolated finds of Clovis bifaces have been reported from northern and northwestern regions during the twentieth century (H. Aschmann 1952; J.L. Lorenzo 1953; C.C. Di Peso 1955, 1965; S. Arguedas, L. Aveleyra 1953; L. Aveleyra 1961). No Clovis artefacts were reported from the doubtful context at the mammoth kill-site of Santa Isabel Iztapan (a site that did not yield a single radiocarbon date) and no indicators of Clovis camps are found anywhere deep into the Mexican territory. The only exception is El Fin del Mundo, close to the US border in Sonora. But it clearly belongs to the packed cluster of Clovis sites of Arizona (together with Murray Springs, Naco and Lehner), so it does not even count as a proper Mexican discovery. The site of Oyapa, in Central Mexico, allegedly contains Clovis artefacts (G. Cassiano, A. Vázquez 1990), but the surface collection from Oyapa lacks a thorough analysis of lithic technology and the superficial similarities are not sufficient to sustain such a cultural affinity, yet (fig. 27).

◆ Clovis' competitors: The Others

It has always been said that Clovis people moved very fast over the continent (D. Meltzer 2002; G. Haynes 2002; C.V. Haynes 1964, 2005; S. Fiedel 2005); a sort of a "blitzkrieg", leaving mammoth carcasses and short-lived camps in their path (fig. 26). Independent of the relationship between this idea and the "Clovis-first" model, the geographic distribution and radiocarbon dates seem to agree with the fast move. Most explanations imply that Clovis people were highly mobile megafauna hunters who invaded an unpopulated continent, with plenty of space to occupy. An idea that is contrary to what we normally learn about hunter-gatherers around the world. In my opinion, the reality was quite opposite: Clovis faced competition and social pressure from other groups; so, they had to be on the move. If they originated elsewhere, they found an America already occupied by the "pre-Clovis" populations. Cultures were already established and foraging territories had already been defined. Clovis hunters were not alone. Then, who were "the others"?

Archaeologists signalled the variability in forms and technologies reflected in the repertoire of fluted points across the Americas (J.E. Morrow, T.A. Morrow 1999). The regional names assigned to different shapes of points received more acceptance as proper local cultural manifestations than mere stylistic variations of a monolithic Clovis culture. On the other hand, new investigations and recent radiocarbon dates tend to propose that other lithic forms and distinct cultural assemblages overlapped historically with the fluted varieties. Analysing the distribution and diversity of different fluted points, one notices a pattern of variability showing an increased evolution of forms towards 'waisted' and fishtail-like contours, from north to south. In North America itself, fluted points display more a lanceolate form with straight parallel sides in the west, north and southwest, and more composed contours with pronounced lateral indentation, to the east and southeast (idem) (fig. 11).

No reliable clues have been recorded yet about the supposed origins of the Clovis culture in Eastern Beringia (US Alaska and Canadian Yukon). In the far north, along the Arctic Foothills, the fluted points show distinct characteristics and overlap the reference interval (fig. 12). The Putu-Bedwell and Mesa sites revealed human-made hearths dating between 11,600 and 9700 RCYBP. The archaeological record shows blades and lanceolate points with certain similarities with contemporary manifestations in mid-continental North America (T.D. Hamilton, T. Goebel 2005) (figs. 12-13).

The valleys of the Nenana, Tanana and Teklanika rivers in Alaska cluster a group of early sites whose culture is divided between two archaeological complexes. The concern here is with the earliest one, the Nenana complex. This used to be the 'component I' in sites like Dry Creek, Moose Creek,

Walker Road, Owl Ridge, Broken Mammoth, and Swan Point (fig. 13). One of the core discussions about the Arctic cultures is whether they link, causally, with the Siberian Palaeolithic cultures, whose inventory is dominated by microblade industries. A Siberian affinity with microblades is evident in the following Denali complex, but not in Nenana. The lithic assemblage is characterised by blades, flake tools, scrapers, anvils, unifacial tools, lanceolate points and the teardrop-shaped “Chindadn” points (fig. 12). They hunted northern herbivores, small mammals, waterfowl, but hardly had contact with proboscideans (T.D. Hamilton, T. Goebel 2005; A.C. Roosevelt et alii 2002; D. Stanford et alii 2005). The complex is as early as 11,800 RCYBP and lasts until about 10,500 RCYBP. It has a ‘pre-Clovis’ start but it undoubtedly overlaps Clovis in the south, lasting longer. The early dates are accepted even by the “fossil” partisans of the “Clovis-first” dogma, as supporting argument for the origins of Clovis within Nenana’s early phases (C.V. Haynes 2005; S. Fiedel 2005, 2007).

A mysterious culture existed about the same time as Clovis in the western United States, mainly in the Great Basin, the Snake River Basin, Rocky Mountains, intermountain valleys of the West and California (fig. 18). People there adapted to an environment of lakes, wetlands and highlands. It is known as the Western Stemmed Tradition (WST), characterised by a diversity of stemmed and shouldered types, lacking fluted points (figs. 18, 11/C, D, E). There are fluted bifaces in the area, but they must belong to a later penetration of Clovis groups migrating from the Plains. They were wide-spectrum, season-adapted foragers and do not seem to have been interested in megafauna. WST’s lithic assemblage contains a variety of bifaces, lanceolate points, crescents, adzes and ground stone tools. The crescent (moon-shaped, curved biface) is a typical tool, although its function is still debated (A.J. Dansie, W.J. Jerrems 2004; D. Stanford et alii 2005) (fig. 11/E). This culture is a viable candidate for older-than-Clovis occupations in North America. Its chronology seems to expand over a long interval between 11,600-8000 RCYBP. C. Beck and G.T. Jones (2010, 2012) already proclaimed the presence of the Western Stemmed Tradition in the region long before Clovis, probably coming from the coast after the uprise of ocean levels, and then an inter-cultural encounter between the two; a theory questioned by others (S. Fiedel, J.E. Morrow 2012).

A contemporaneous cultural tradition, with bifacial technologies similar to the WST ones and dated at least to 12,200-11,200 cal BP, but perhaps as old as 13,000 cal BP, is the “Paleocoastal” maritime adaptation identified on the US coast of the Pacific and on the Channel Islands of California. As important as the Western Stemmed Tradition, the creators of this Paleocoastal culture were partially contemporary with Clovis and survived through the Younger Dryas cooling event. Their technology and geographic location indicate seafaring and island colonisation in early Paleoamerican times, a diversified maritime economy and a subsistence based on sea birds, marine mammals and fish (J.M. Erlandson 2002; J.M. Erlandson, M.L. Moss 1996).

The case of the Eastern and Southeastern US is interesting and complex. During Clovis times, the region was characterised by the presence of a variety of ‘waisted’ fluted points. Their shape is sinuous, contracted above the base, with outflaring ears (fig. 22). Most authors still consider them a Clovis variety, although they could reflect local variations belonging to very different groups. Many discoveries occur in Florida and Virginia, as isolated points, kill-sites and workshops. Florida is rich in artefacts made of bone and ivory. This part of the continent has always shown a clear foraging economy, without emphasis on the extinct large mammals (B.C. McCary 1951; M. Faught 2006; A. Hemmings et alii 2004; J.S. Dunbar, A. Hemmings 2004; D.G. Anderson 2005).

Florida precedes the Central American scenario. There is a weak presence of Clovis-like fluted points at a few sites, roughly contemporary with the northern mammoth hunters, but more likely manifesting at the onset of the Younger Dryas. Some authors consider them Clovis, anyway (A.J. Ranere 2006) and speak of a “circumgulf interaction” sphere, ranging from Florida to Panama: the same waisted form typical for the southeastern US, possibly born from a southbound later migration (M. Faught 2006). The sites worth mentioning here are located in Guatemala (Los Tapiales), Costa Rica (Turrialba) and Panama (La Mula West, Madden Lake, Nieto, Cueva de los Vampiros) (fig. 14). The dates are interesting, between 11,700-10,500 RCYBP, reaching almost 14,000 cal BP. They imply controversy, showing contemporaneity and anteriority, rather than later Clovis-derived manifestations (idem). Actually, other authors deny any presence of Clovis in the region. According to A.C. Roosevelt et alii (2002), the points here are technologically different and the supposed flutes are rather base thinning flakes. The Central American fluting traditions could be indicators of parallel, independent occupations. It is worth investigating if the Mexican site of Oyapa, already mentioned above as a possible Clovis camp, with some fluting documented on bifaces, could also be a candidate for a different culture employing this technological marker.

"The first South Americans were not Clovis clones", as T. Dillehay wrote (2000, p. 6). And indeed, the austral continent, when seen from North American prehistory, looks like another world. It has never been affected by the "Clovis-first" paradigm, or by the biased views emphasising megafauna overkills. South America was diverse, culturally. It has never been dominated by a main culture. Highly eclectic in landscapes and ecosystems, almost void of glaciers and free to be peopled in all directions from very old times, this part of the world has always experienced a pronounced regionalisation and archaeological diversification during the Late Pleistocene and the Early Holocene. Lithic material is very diverse, communal kill sites are almost absent, hunted mammals were completely processed, campsites and inhabited rockshelters are abundant and the subsistence has always been a foraging one, based on a wide and complete use of resources (idem; L. Miotti 2004; R. Gruhn 2004, 2005; A. Borrero 2006). There are indications of the presence of possible Clovis points in Venezuela and Chile (L.J. Jackson 2006), but, as some specialists propose, they do not show proper North American filiation, rather being local manifestations of fluted forms (A.C. Roosevelt et alii 2002) (fig. 15).

The emblematic artefact in South America is the so-called "Fishtail" point (fig. 15/A). It is widespread over the continent, in Argentina, Uruguay, Chile, Peru, some parts of Brazil and Colombia. Fishtails hardly consolidated as a proper culture (with a more or less unitary artifactual assemblage), although they do define a horizon. These points are varied in shape (C. Gnecco, J. Aceituno 2006), although the prototype shows a stemmed artefact, with wide triangular or ogive-like convex-edged body, and a fluted concave-edged and concave-based stem. The variation in form is better explained by a high incidence of resharpener, as recently shown (R. Suárez 2003, 2009, 2010, 2011a, 2011b; C. Castiñeira et alii 2011). Fishtail makers also preferred exotic materials, such as translucent agate and quartz crystal, an aspect quite unique for the southern continent, where most tools are normally elaborated in locally available materials (H.G. Nami 2009; R. Suárez 2010, 2011a; C. Méndez et alii 2010). There is also a scarce unifacial variant, maybe by-products of the learning process (R. Suárez 2009). Most finds come from the surface, although the buried contexts increased recently. Its chronology is still not well understood. It is true that the Fishtail culture is a bit later than Clovis, more contemporaneous with Folsom culture in the north (L.J. Jackson 2006). Its average dates are 10,800-10,100 RCYBP (J.E. Morrow, T.A. Morrow 1999). But there are older dates, approaching 11,200 RCYBP, for example at the type-site of Fell Cave, where it was first recognised by Junius Bird (M. Massone 2003) (fig. 15). That makes it also contemporary with Clovis. The possible historical and cultural relationship between the two is still a vivid discussion, but Fishtails remain a local South American manifestation of the Late Pleistocene, employed by hunter-gatherers who exploited a wide array of ecosystems and lived on a diversity of resources, displaying formal and technological discrepancies with their counterparts in the north (L. Miotti 2004; L. Miotti et alii 2010; G.G. Maggard 2010; H.G. Nami, A. Castro 2010; R. Suárez, D.S. Leigh 2010; T. Dillehay 2000).

There are no well-defined cultures in South America contemporaneous with Clovis; at best, individual sites which do not form an integrated image, yet (fig. 15). All occupations start sometime during the Clovis interval and continue well into the Younger Dryas climate reversal. The barrier between the Terminal Pleistocene and the Transition to Holocene is not clearly expressed in the archaeological record. Among these sites, Agua de la Cueva in Argentina is dated to 10,950-9,200 RCYBP; a guanaco-hunting site using expedient tools made of quartz, rhyolite and chalcedony (A. García 2003, 2009; M.M. Paez et alii 2003). Also in Argentina, the sites of Cerro La China, Cerro Tres Tetras, Los Toldos, and La María-Casa del Minero 1, focused on camelids, revealed simple tools, dating around 11,500-10,000 RCYBP, maybe pushing back to 12,000 (M.M. Paez et alii 2003; R.S. Pautero 2003a, 2003b; T. Dillehay 2000). On the Peruvian coast, a fishermen community lived at Quebrada de Los Burros at 11,000-10,000 B.P. (D. Lavallée 2003). By the same time, coast-adapted people from Quebrada Jaguay subsisted on seafood and imported raw materials from the highlands (T. Dillehay 2000; S. Fiedel 2007; R. Gruhn 2004). On the Chilean coast, Quereo was a possible butchering site of Pleistocene fauna, in use by 11,600-11,000 RCYBP (T. Dillehay 2000; D. Jackson 2003). In Peru's highlands, Pachamachay Cave's inhabitants hunted vicuña with triangular and lanceolate points, maybe as early as 11,800 RCYBP, but surely around 10,500 RCYBP (T. Dillehay 2000; R. Gruhn 2004). El Inga (Ecuador) displays a strong Fishtail occupation with emphasis on obsidian, possibly occupied at 11,200 RCYBP (T. Dillehay 2000), but probably of a later age (A.C. Roosevelt et alii 2002). T. Dillehay (2000) stressed that northwestern South America had an important early unifacial industry, with simple cutting and scraping tools made on flakes, partly pre-dating Fishtails, at 11,400-8500 RCYBP. Its manifestations occur at Tibitó and Tequendama (Colombia), Tagua-Tagua (Chile), Talará (Peru) and as the Itaparica Tradition in Brazil. In the northeast of this

country, 12 sites cluster between 11,500-8500 RCYBP. At Caverna da Pedra Pintada, occupants left hearths, pigments, quartz and chalcedony artefacts by 11,200-10,000 RCYBP (A.C. Roosevelt et alii 2002).

One of the better-known sites of the period is AEP-1 rockshelter at Piedra Museo, in the Argentinean Patagonia. The earliest component there (Unit 6) ranges between 12,800 and 10,500 RCYBP, alledging a pre-Clovis occupation of 16,000 cal BP that lasts through the Younger Dryas. Pre-Fishtail bifacial tools were used to butcher horse, vicuña and ñandú (L. Miotti 2004; L. Miotti et alii 2003b; L. Miotti, R. Cattáneo 2003; L. Miotti, M. Salemme 2005; R. Gruhn 2005).

◆ After Clovis: the survivors

Clovis culture disappeared almost instantly between the end of the Allerød dry period (culminating in the so-called "Clovis drought") and the very beginning of the Younger Dryas, around 12,800 cal BP. Something happened in a very brief period of time, powerful enough to induce significant changes in the lives of people and make cultural signatures disappear from the archaeological record. The situation can be appreciated very well at several archaeological sites, for example at Murray Springs, Arizona (C.V. Haynes, B.B. Huckell 2007) (fig. 5) and reflected in the recent reconsideration of radiocarbon ages (M. Waters, T. Stafford 2007). Understanding the changes that occurred during the Younger Dryas, in terms of cultural diversification and increased regionalisation, remains a difficult task. We probably should not assume Clovis as a culture reflecting an ethnic group, but maybe as a widespread technological approach (M.B. Collins 2007). Nevertheless, it is plausible to see them as a network of strongly interrelated groups (perhaps in terms of behaviour and beliefs based on interregional objective or mythical kinships) who held an identity and consciously shared a specific technology. Because, as seen above, there were many other groups and traditions sharing the time and space with them and Clovis possibly meant more than just "a way of doing things". In my opinion, the reason to stick to a technology or adopt another has more to do with behaviour, traditions, culture hermetics, beliefs etc, than with the mechanism of adaptations and responses to environmental change. They only existed in the archaeological record for about 300-400 radiocarbon years, meaning around 500 calendar years. Why did they vanish suddenly while the other cultures continued with little changes during the subsequent centuries or millennia into the Holocene? It probably had to do with cultural porosity or versatility: inability to adapt customs, beliefs, and rigid norms to changes. Clovis people failed to do so and disappeared as culture. This subchapter is about those who survived.

The period is called "Late Paleoindian", in D.G. Anderson's words (2004, 2005) (fig. 3). Folsom is probably the most famous North American foraging culture that made it through the Younger Dryas. As said above, it was first defined in 1926 at the eponymic site in New Mexico, where a clear association between points and extinct bisons demonstrated, for the first time, the early presence of humans on the continent (A.T. Boldurian, J.L. Cotter 1999). Characteristic for the Southern and Northwestern Plains - but also for high altitude sites in Colorado Mountains (C.T. Hurst 1943) - this culture of bison hunters follows Clovis immediately, with a chronological range of 10,800-10,200 RCYBP (D. Stanford 2005; D.G. Wyckoff 2005) (figs. 18-19). Even so, there are no indications of causal cultural succession between Clovis and Folsom. This culture is part of the accelerated process of cultural diversification that one can notice in North America in that epoch. It is often referred to as the Folsom-Midland complex, some authors considering there is no real distinction between the two. Folsom is very homogenous compared to Clovis, and its typical projectile point is a smaller lanceolate point, with a deeper basal concavity. It is fluted on one or both sides and the flake scar is long, wide, occupying most of the biface's surface, almost reaching the distal end (fig. 11/H). Midland points are similar, but generally lack fluting. In some opinions, Midland and Folsom are likely different, but related technologies. Although wide-spectrum foragers, Folsom hunters organised large communal bison kills, with more than a hundred specimens per event. Among the important kill-sites are Lindenmeier, Lipscomb, Bonfire Shelter, Blackwater Draw, Lubbock Lake, with habitation camps at Horn Shelter, Adair-Steadman, etc. They don't use ivory anymore, but still employ bone artefacts and use red ochre for ritual purposes and hide processing. Their lithic assemblage is diverse, keeping interest in distant raw materials, but blade technology almost disappears (D. Stanford 2005; G. Frison 2005; J.M. LaBelle, C. Newton 2010; A.C. Goodyear 2010).

In the typical Southern Plains chronology, Folsom is followed by the Planview horizon (D.G. Wyckoff 2005) (figs. 11/G, 18). Remaining in the Plains' tradition of large bison hunts, probably

organised before important social gatherings between late Fall and early Spring, Plainview people were generalised foragers, too. Their projectile points lack fluting, but show different degrees of base concavity and thickness, maintaining basal thinning. There are several point varieties and, for this reason, the complex is better known as Goshen-Plainview, with particular variants, for example the St. Mary's Hall points as a later version (9900-8700 RCYBP). The chronology is rather confused in the literature, oscillating between contemporaneity with Clovis to more conservative views of 10,000-8000 RCYBP. Recent assays situate it in late post-Folsom times until about 9-8000 RCYBP. Together with Golondrina and Angostura traditions, Goshen-Plainview is one of the Transitional types between Pleistocene and Holocene (V.T. Holliday et alii 1999; K.B. Tankersley 2004; D. Stanford 2005; D. Stanford et alii 2005; G. Frison 2005; P.C. Condon et alii 2009; M.E. Hill 2010) (fig. 11/F)). In Bruce Bradley's opinion, Folsom is technologically related to and rising out of Goshen, which is derived from some northern branch of "pre-Clovis" originated in the East, spreading northwest along the retreating glacial front, including Chesrow in Wisconsin¹.

Several other complexes define this Transitional period, well defined culturally but still confused chronologically, somewhere between 10,000-9000 RCYBP. The Agate Basin complex - probably contemporaneous with and later than Folsom - manifested over the Plains, their unstemmed and unfluted long, foliaceous and sometimes bipointed bifaces being "the most lethal weaponry" of those times (G. Frison 2005, p. 276; D. Stanford 2005) (fig. 20/A). The Hell Gap complex probably derived from Agate Basin, technologically alike. The points are flat-based stemmed lanceolates, with rounded shoulders, and slightly contracting grounded stems (fig. 20/B). The flaking technique included soft hammers and pressure. They hunted bison herds by traps and cliff falls (D. Stanford 2005; S.R. Holen, K.A. Holen 2009). The makers of the notched San Patrice points, likely related to the Dalton type, were also a Plains (southeastern) adaptation hunting bison during the Younger Dryas, from New Mexico to the eastern woodlands (S. Hurst et alii 2009). The Cody complex included various cultural manifestations represented by the Scottsbluff, Eden and Alberta types, all square-based, shouldered and barely stemmed, adding to the strange one-shouldered, stemmed "Cody knife" (fig. 21). The Transitional phase concludes in the US Southwest with the still mysterious and poorly known San Dieguito-Sulphur Springs complexes, tentatively situated at 10,000-8000 years ago. Already showing technological characteristics of the Holocene, these confuse cultures maintain certain ties with the earlier manifestations in their tool-kit (E.J. Dixon 1999; C.V. Haynes, B.B. Huckell 2007).

Even more interesting is the situation in North America's northeast and southeast. There are late variants of fluted points resembling Clovis, named Gainey, Debert, Cumberland, Barnes, Crowfield, and Redstone. They vary in size, contour, fluting and finish technique (D.G. Anderson 2005; B. Lepper 2005; D. Stanford, B.A. Bradley 2012) (fig. 11/A, B). In Florida, there are two typical forms for this period: Suwannee and Simpson, probably in this chronological order (fig. 22). They have composite shape, the first displaying expanding ears and the latter narrower base, with pronounced contracting point above it, looking like fish (J.S. Dunbar, A. Hemmings 2004; M. Faught 2006). In other views, Simpson could be of early dates, maybe pre-Clovis and, in this case, potential precursor for South American fishtails.

In Alaska, this period belongs to the Denali complex, dated to 10,200-8200 RCYBP. It appears in the younger levels of some of the sites already mentioned above as Nenana exponents, adding Panguingue Creek and the Tangle Lakes site cluster. This cultural manifestation is characterised by microblades, conical microcores, lanceolate bifacial points, wedge cores and blades, more akin to Siberian traditions (T.D. Hamilton, T. Goebel 2005; W.R. Powers, J.F. Hoffecker 1989). More recent assessments imply that the Alaskan fluted points are rather contemporary with late Northeastern fluted and late Folsom of the Plains.

In South America, the occupations belonging to the pre-Holocene Transition require more investigations. In Uruguay, Rafael Suárez (2003, 2011b) has recently defined the Pay Paso component (11,000-10,200 RCYBP) and the K87 (or El Tigre) points (10,420-9700 RCYBP), named after the eponymous sites, following the Fishtail occupation (fig. 16/B, C). Units 4/5 at Piedra Museo (Argentina), yet containing a few Fishtails, date at 10,400-9200 RCYBP (L. Miotti, R. Cattáneo 2003; L. Miotti et alii 2003a). Several other sites throughout Argentina show generalised foraging economies of later dates: Huenul cave, with obsidian and basalt debitage, 9530 RCYBP (R. Barberena et alii 2010), Arroyo Malo 3 rockshelter, 9000 RCYBP (S. Diéguez, G. Neme 2003), culturally modified guanaco remains at Chorrillo Malo 3 rockshelter around 9700 RCYBP (N.V. Franco, A. Borrero 2003),

¹ Bruce A. Bradley, personal communication, 2012.

simple tools plus guanaco bones dating to 9700-9000 RCYBP at Cave 7 of Cerro Casa de Piedra (M.T. Civalero, C.A. Aschero 2003), La Gruta 1 from Deseado Massif, with chalcedony and obsidian flaked tools from 10,800 RCYBP (N.V. Franco et alii 2010), rockshelter 1 from Cerro El Sombrero and six more sites in the Tandilia range in the pampa, with lithics, hearths and pigments spanning between 10,700-9500 RCYBP (D.L. Mazzanti 2003; N. Flegenheimer 2003).

On the southern coast of Peru, Quebrada Tacahuay sheltered marine-adapted foragers employing unifacial tools, who fished anchovies and hunted sea-fowl (T. Dillehay 2000; S. Fiedel 2007). Typical is also the presence of the Paiján culture in the Moche Valley, partially coexisting with the unifacial industries. Paiján points are slim, triangular, shouldered and narrow-stemmed (fig. 17/A). Its creators frequented coastal plains and adjacent foothills and lived on fish, deer, birds and lizards. The dates cluster between 10,800-8500 RCYBP (T. Dillehay et alii 2003). Probably contemporary and somehow similar are the Restrepo points encountered in open sites in central Colombia (T. Dillehay 2000). The Colombian locality of San Isidro seems to contain indicators of anthropic disturbance of forests by fire around 10,000 RCYBP, in accordance with an incipient control of plants (C. Gnecco 2003), although the problem of man-made fires and hearths versus wildfires in the archaeological record is always a matter of concern (R. Bonnichsen, R.T. Will 2005). The "south Andean central tradition" (Peru and Chile's highlands) enlists a series of sites dating to 10,800-9500 RCYBP (idem). In Brazil, the Paranaíba Phase (10,700-9000 RCYBP) manifests as bifaces and limaces, while the younger occupation of Santa Elina rockshelter contains hearths, limestone, chert and quartz tools and hematite plaquettes going back to 10,100 RCYBP (T. Dillehay 2000; A. Vilhena 2011).

◆ "Pre-Clovis" or those who came before

It is proclaimed that the "Clovis-first" model is dead (R. Bonnichsen 1999a, 1999b). Beyond the archaeological epic wars in the Americas, the current naked data presents it as a reality. This topic provoked an arduous debate lasting for decades, with very complex hues (cf. D.S. Whitley, R.I. Dorn 1993; T. Dillehay 2000; D. Meltzer 2009; D. Stanford, B.A. Bradley 2012, etc.). Unlike the Old World - where very ancient dates of human occupations come and go frequently without much distrust from peers and the academic mind is prepared to accept changes more easily - the American scenario transformed the "pre-Clovis" (or "older-than-Clovis") argument into one of the harshest battles in the history of archaeology. The debate continues today, as the skepticism remains unbeaten or slightly modified in a handful of North American authors (S. Fiedel 2006a, 2006b; C.V. Haynes 1964, 2005; A.C. Roosevelt et alii 2002). In spite of that, most skeptics have admitted the reality, for some time now (R. Lewin 1989). The situation has always been different between the two halves of the hemisphere, as in South America the conservative paradigm was never embraced (R. Gruhn 2004, 2005; A. Bryan 2004; A. Bryan, R. Gruhn 1989; L.F. Bate, A. Terrazas 2006; T. Dillehay 2000; A. Borrero 1999, 2006).

There are several aspects defining the discussion on older-than-Clovis discoveries: if the "pre" populations arrived in one or several migrations; if they are to be seen as Clovis progenitors or totally independent groups; if they are or not potentially visible in the archaeological record; what a pre-Clovis complex should look like (fig. 24); and, finally, how old the radiocarbon dates should be in order to become "acceptable". The ad-hoc "adaptations" one can notice in the publications of the detractors facing increasing evidence are interesting: older than 11,500 RCYBP are acceptable if they are "not too old" and help suggest progenitors for the Clovis protagonists (cf. C.V. Haynes 1964). And also, assuming there were very old human incursions into Americas that died out, demographically low without leaving recognisable signatures under ground. Otherwise, the evidence is guilty of "factual and logical weakness" (S. Fiedel 2006a, p. 45). Any new potential ancient presence encounters rigid criteria before being accepted (at least in the United States, because in Mexico there is much less care about the perfection of data). Contexts, stratigraphy, excavation technique, excavator's professionalism, dated material, everything is questioned and expected to be almost impossibly perfect. Going to extremes, even *Homo erectus* groups could have entered the continent at some point, after all, why not? But, as they must have died out without leaving trace, the status-quo is happily maintained (S. Fiedel 2006a; D. Meltzer 1989, 2009; A.J. Jelinek 1992; A.C. Roosevelt et alii 2002; D.G. Anderson 2005; C.V. Haynes 2005).

Many sites claimed such antiquity and most of them entered the "pre-Clovis credibility decay curve" (D. Meltzer 2002). The "fight for acceptance" is a constant reality for the intrepid discoveries in the New World (E. Marshall 2001). Once again, it is important to be remind that there is a

fundamental difference between such a debate in Mexico and the United States. In Mexico, the "Extremely Old Dates syndrome" manifested freely and without criticism, too widely accepted as a paradigm, was based only on the authority of the proponents (C.F. Ardelean 2013). And today those sites can be refuted. In the USA and the rest of the continent, the extreme skepticism and the pressure imposed by the "Clovis-first" model yielded a positive effect: today, there are secure older-than-Clovis occupations that passed the test of the doubt (fig. 23). Even so, nobody has safely produced such old dates as those traditionally claimed for Mexican sites (that is, in excess of 25,000 years).

Sandia Cave in New Mexico was once considered an old site, where one-shouldered bifacial points were reported in association with extinct fauna. It is dated today at no more than 3500 RCYBP, the initially alleged antiquity being the result of a hoax (D. Stanford 2005; J.C. Thompson et alii 2008; J.C. Thompson, C.V. Haynes 2012). In the same state, Pendejo Cave doubtfully claimed for dates in excess of 30,000 years, with alleged human hairs, fingerprints and Pleistocene mammals (R. MacNeish 1948[2009]; E.J. Dixon 1999). The Calico Hills site, California, built its fame on crude "tools" considered contemporary with the Old World's Lower Palaeolithic, as proclaimed by Louis Leakey's 'verdict' in 1963. The famous discoverer of the Olduvai beds used to lecture widely in the USA in those years and for him it was natural to identify as natural an assemblage of crude, old-looking stones in a region of California. Today, they are known to be mere "geofacts" of natural origin, although their antiquity is sometimes defended (F.E. Budinger 2004; cf. D. Meltzer 2009). Association between humans and dwarf mammoths on the Channel Islands, California, and artificially modified bones of extinct animals at Trail Creek, Alaska express other such unclear cases (E.J. Dixon 1999). Several man-made hearths at Lewisville, Texas yielded valid dates of 36,000 years. But the ancient people there, who actually lived in much later times, burned ancient lignite in their fireplaces, cheating on us (D.G. Wyckoff 2005; D. Meltzer 2009). In Alaska, the fortuitous discoveries of artefacts, modified bones and mummified mammoths at the Fairbanks Muck Deposits are an intriguing and promising case for older-than-Clovis, but they lack secure contexts (E.J. Dixon 1999). Eastwards, in the Yukon territory (Canada), the Bluefish Caves and the Old Crow basin sites suggested very old human presence, with lithics and cut marks on bones, of 25 000-40 000 years of age; not sustained as valid evidence, yet (idem; J. Cinq-Mars, R.E. Morlan 2005; M.C. Wilson, J.A. Burns 2005; D. Meltzer 2009).

In Brazil, there are two important cases. The notorious one is Pedra Furada rockshelter, worked by French archaeologists who claimed to have discovered quartzite tools and hearths 15,000 and 30,000 years old (fig. 15). The case is dismissed, based on profound doubts on the artificial nature of the finds (D. Meltzer 2009; T. Dillehay 2000). The other case is a recent discovery, with more chances of survival in academia: the early phase at Santa Elina rockshelter, Mato Grosso, provided marginally retouched flakes, charcoal and *Glossotherium* osteodemes dated to around 25,000 years ago (A. Vilhena 2003, 2011) (fig. 15). In spite of this spectrum of doubts, the pre-Clovis occupation has become a reality and some others even speak of patterns of archaeological manifestations, such as culturally modified bone, unifacial tools and flaked bifaces (D. Stanford et alii 2005).

Mexico has its own list of sites that came to life as supposed evidence of very old presence of people, as already mentioned earlier in this text. Tlapacoya, south of Mexico City, was one of them (figs. 27-28). Supposed hearths placed on an ancient cobble beach of an extinct lake yielded dates around 21,000-24,000 RCYBP. An obsidian hydration date on a prismatic blade trapped under an ancient tree log in the lower strata at the site suggested occupation in excess of 20,000 years; the wood itself was radiocarbon dated at about 23,000 RCYBP (J.L. Lorenzo, L. Mirambell 1986, 2005; L. Mirambell 1973, 2000, 2001). Tlapacoya has serious problems in being accepted as a valid older-than-Clovis discovery, although it continues to be blindly accepted by the majority of scholars in the country. The hearths may not have been hearths at all, but naturally formed features, the radiometric results show too large deviations, while the stratigraphic position of the obsidian blade is also questioned (G. Sánchez 2001; D. Huddart, S. González 2006, p. 98; S. Sedov et alii 2010). El Cedral, in the deserts of Central-Northern Mexico, is another sounded site that never misses in the Mexican literature and textbooks, with old radiocarbon dates beyond 30,000 years obtained from alleged hearths made of mammoth bones in a spring context, as well as a series of artefacts associated to the Pleistocene sediments (J.L. Lorenzo, L. Mirambell 1981, 1984) (fig. 27). Sadly, the documentation of the claimed contexts remains poor and unconvincing, even after the recent publication of the monograph (L. Mirambell 2012), the radiocarbon dates look not reliable and were never replicated, while there is no way to verify the accuracy and legitimacy of the information today. The story of the

discoveries around the Valsequillo reservoir in Puebla is much too complex to be related here (see C.F. Ardelean 2013). However, the confusions and controversies around the old dates at the site are much too strong to allow it to be considered a valid older-than-Clovis locality. I consider that, for the moment, there are no archaeological sites in Mexico able to prove a human occupation older than the Clovis threshold.

Then, after such a diversified controversy, what is the reliable evidence today on the continent?

In the Tanana valley, Alaska, there are two Nenana phase sites: Broken Mammoth and Swan Point. Going back to 11,800 RCYBP, they are considered by some as potential Clovis progenitors (C.V. Haynes 2005). The presence of microblades in the deepest levels (>12,300 RCYBP) is dubious, but sufficient to claim Siberian connections (S. Fiedel 2006b). With their excavated contexts and unifacial industries, these localities were in use by 14,000 cal BP (R. Bonnichsen 1999b; T.D. Hamilton, T. Goebel 2005; D. Yesner 2007). In the Northwestern Plains and adjacent mountains of USA, the evidence is absent so far (G. Frison 2005). The Northwest coast has the "Manis mastodon" (11,800-12,000 RCYBP) with a bone projectile tip found between its ribs (E.J. Dixon 1999). Lamb Spring, Colorado, below a Cody complex level, yielded an insecure butchering event 13,000 years old (idem). Burning Tree Mastodon site, Ohio, did not reveal artefacts, but a possible human-made meat cache, with dates reaching 11,600-12,200 RCYBP. Still uncertain is Burnham site's situation, in Oklahoma, where the association of bison and artefacts could be as old as 26,000 years (D.G. Wyckoff 2005). The open site at Shriver, Missouri, has an early non-point component probably slightly older than Clovis' onset. There is an interesting case in Wisconsin, too, known as the Chesrow complex. Settled closely to the Pleistocene ice front, focused on caribou hunting but still killing proboscideans, Chesrow people used thick, basally thinned, quasi-fluted, heat-treated and side-ground points. Flaked tools and cut marks appeared in the context of the Schaefer and Hebior mammoths, the most important sites of this cultural area (fig. 23). The dates are around 12,500 RCYBP, one millennium older than Clovis (D.F. Overstreet 2004, 2005; C.V. Haynes 2005).

In Eastern-Southeastern North America, the discoveries are more abundant and it's there where the most secure pre-Clovis finds appear (fig. 23). Saltville, Virginia, shows the intensive exploitation of a mastodon carcass, with associated bone and stone tools employed in the process, and also musk ox remains, apparently from 14,500 RCYBP (A.C. Goodyear 2005; D.G. Anderson 2005; J.N. McDonald, J.E. Wiederhold 2009). Topper site in South Carolina (dated only by OSL -Optically Stimulated Luminescence- and stratigraphy to about 16,000 cal BP) revealed concentrations of chert nodules, chert flakes, quartz artefacts, blades, retouched flakes and a supposed "smash-core" technology (D.G. Anderson 2005; A.C. Goodyear 2005; E. Marshall 2001). To the south, Unit 3 at Page-Ladson, Florida, has a possible pre-Clovis occupation of 12,400 RCYBP, manifested as potentially proto-Clovis points and chert artefacts in relationship with mastodon bones and ivory (J.S. Dunbar, A. Hemmings 2004; D. Stanford, B.A. Bradley 2012).

Three discoveries from the eastern regions have been recently brought into attention and they actually form the most important, intriguing and promising corpus of evidence for the older-than-Clovis occupations in North America. A Solutrean-like bipointed biface (known as the "Cinmar biface") was dragged from the bottom of the ocean in by the coast of Virginia, together with mastodon bones dated to 23,000 cal BP, from a place corresponding to the ancient coastline (figs. 23, 24/H). In the Chesapeake Bay, Maryland, an exposed profile at Miles Point revealed a large boulder used as an anvil for the production of stone tools, underneath the Tilghman paleosol, a known stratigraphic marker dated to 24,000-16,300 cal BP (fig. 24/E, F). In the vicinity, at Oyster Cove, a similar projectile point looking like the one at Miles Point and other early sites, appeared in the same palaeosol (D. Stanford, B.A. Bradley 2012) (fig. 24/G).

These points resemble those from Cactus Hill, southeast Virginia (figs. 23, 24/A, B). Considered by some as the best candidate for a secure pre-Clovis occupation (G. Sánchez 2010), it is still questioned by those who question everything (C.V. Haynes 2005; S. Fiedel 2006a). However, Cactus Hill, together with the discoveries in the above-mentioned Atlantic coastal sites, completes what possibly means the earliest cultural evidence of Pleistocene human occupation in North America. The Cactus Hill small triangular points of concave base are similar to some mentioned above and are technological pairs of the Miller point excavated from Meadowcroft Rockshelter (figs. 23, 24/C, D). Beneath the Clovis occupation, there was an older human presence manifested as hearth-like concentrations of charcoal, quartzite flakes and quartzite prismatic blades. Dates range from 15,000 to almost 17,000 RCYBP and there is little to discredit their authenticity (D. Stanford, B.A. Bradley 2012; E.J. Dixon 1999; A.C. Goodyear 2005). The traditional approach to the pre-Clovis problem

would have always emphasised Meadowcroft Rockshelter (see below). Today, thanks to the discoveries from Cactus Hill, Miles Point, Oyster Cove and thanks to the Cinmar biface, the emphasis shifts to these more clear archaeological arguments, in which the technology together with the radiocarbon dating and the geology became more solid arguments that will soon surpass in strength and relevance the older evidence that still carries behind a long history of doubts and confusions. However, the reader can notice something very important: the earliest archaeological sites in USA so far are situated in the east and northeast of the country.

At the opposite end of the country, at Paisley Caves, Oregon, there is another kind of indicators (fig. 23). Bones of butchered large mammals showed up in association with lithic debitage, a Western Stemmed-like obsidian point and human coprolites that yielded human DNA as additional evidence. The obsidian hydration and radiocarbon dates coincide: humans were there, in the Northwest, already by 16,000-14,300 cal BP (M. Gilbert et alii 2008; A. Oberling 2010). At the opposite end of the continent, in Venezuela, Taima-Taima is probably the second most important austral site claiming older-than-Clovis age, in spite of its decreasing fame in publications. Studied in the 1960's-1970's, the site is a waterhole in a small basin. In Unit 1, the butchered remains of a juvenile gomphothere (a warm-adapted smaller variety of proboscidean with straighter tusks) appeared in clear association with the medial fragment of an El Jobo projectile point sheltered in the pelvic cavity (figs. 15, 17/B). It was the first challenge for the "Clovis-first" model, when originally announced in 1976. Dates obtained from several materials in that context range between 14,000-12,500 RCYBP. El Jobo points (long, narrow, bipointed willow-leafed bifaces) remain mysterious and confusing. Hardly found in buried strata, these points duplicate the problems built around the Lerma points in North America (C.F. Ardelean 2013). Actually, if these taxa existed as objective archaeological realities, they might be culturally related (R. Gruhn, A. Bryan 1984; R. Gruhn 2004, 2005; T. Dillehay 2000; L.J. Jackson 2006; C. Gnecco, J. Aceituno 2006).

If a line were drawn connecting the two better-known and most famous pre-Clovis sites in the Western Hemisphere, it would probably be called "the Cross Creek - Chinchihuapi Creek line". It would be about 8800 km long, running in an almost perfectly north-south direction, along the 75°W meridian. At one end, Meadowcroft Rockshelter, Pennsylvania, US. At the other end, the Monte Verde open site, near Puerto Montt, Chile (figs. 15, 23). These two sites stood for decades at the core of the older-than-Clovis argumentation. As mentioned above, at least for the North American end of the line, the current discussions started to shift emphasis towards the more intriguing recent discoveries from Maryland and Virginia. Nevertheless, these two sites must be presented, as they used to be the "classic" evidence and their historiographical importance in the debate is crucial.

Meadowcroft, Pennsylvania, is a deeply stratified rockshelter with a very long cultural occupation. It is among the best-studied Paleoamerican sites, part of a complex and complete regional archaeological study that yielded hundreds of other old localities. Beneath heavy roof debris, stratum IIa provided one of the best arguments for older-than-Clovis presence. With the neighbouring site of Krajcic completing the image, the here-defined Miller complex includes a small, unfluted, resharpened lanceolate biface similar to others mentioned for the eastern North America (fig. 24/C, D). The excavators describe it as a unique, blade technology with standardised small polyhedral core-and-blade industry. The artefacts differ from what is known at any time in North American prehistory. The dates make the case: 12,800 RCYBP, calibrating around 15,000 cal BP Older occupation is suggested, but such ages are sufficient for the debate (J.M. Adovasio et alii 1978; J.M. Adovasio, D.R. Pedler 2005; J.M. Adovasio et alii 2005; C.V. Haynes 2005; A.C. Goodyear 2005; D. Meltzer 2009; D. Stanford, B.A. Bradley 2012). Other authors see today a similarity between Meadowcroft, Cactus Hill and Chesapeake technologies (D. Stanford, B.A. Bradley 2012).

Monte Verde, Chile, is a unique case in the world archaeology, a sort of South American Pompeii. Sealed under a bog peat formed after its abandonment, the site is well-preserved, a context frozen in time. Component MV-II is the most important. Tom Dillehay's multidisciplinary team excavated a large house with wooden foundations and pole-and-hide walls, with hearths and clayed storage pits, next to a wishbone-shaped structure used as a mastodon carcass processing shelter and healing house, with an amazing amount of perishable materials, human footprints and animal fat conserved for study. El Jobo-like points were found at the site, together with bola stones probably for hunting or fishing, unifacial tools, wooden digging sticks and mortars, bone implements, cordage, hide, etc. The academic community has now agreed on the antiquity of the component: 12,500 RCYBP (14,000 cal BP). The other component, MV-I, yielded dates of 33,000 years, but this is less secure and the excavators themselves showed cautious about them (T. Dillehay 2000; T. Dillehay, J. Rossen 2002; D. Meltzer et alii 1997; M. Pino 2003; D. Meltzer 2009).

Such is the “pre-Clovis” scenario at the moment. The oldest dates accepted and coming from coherent contexts cluster after the Late Glacial Maximum and approach, in lesser or greater measure, the 11,500 RCYBP conventional time bar. They rely on professionally excavated strata and have passed the scrutiny of the skeptics and the pressure of paradigms.

◆ Ancient human remains

There is something that does exist in Mexico, as an advantage in comparison to the United States: the freedom to study human skeletal remains, without the constrictions imposed by the famous NAGPRA law in the United States². Starting as a supposed politically correct attitude, this legal requirement transformed into a nightmare for archaeologists, as many important discoveries lost the opportunity to be studied (cf. R. Bonnichsen 1999a, 1999b; D.W. Owsley 1999; F.P. McManamon 1999; A.L. Schneider, R. Bonnichsen 2005; J.R. Powell 2005). The discoveries are abundant in North America, much more than the shallow record in Mexico (fig. 25). But they are not very old. The genetic (DNA) ‘evidence’ is not discussed here, as that needs a specialised approach (see A.C. Stone 1999; T.G. Schurr, D.C. Wallace 1999; J.R. Powell 2005 and others). Neither mortuary patterns nor funerary contexts per se, for reasons of space (see G.D. Steele, J.R. Powell 1999; D.W. Owsley 1999; J.C. Chatters 2010). This section is limited to the revision of the available archaeological discoveries and related radiocarbon dates, in spite of their methodological complications (cf. T. Stafford 1994). It is important to specify that none of the existing human remains in North America (possibly excepting the very recent discoveries from the Yucatan Peninsula in southeastern Mexico) are older than Clovis, all falling in Late Paleoamerican times. It means they may relate to any possible founding events, incoming from any direction.

“Kennewick Man” was one of the most famous candidates for the Late Pleistocene bioarchaeological record and the object of hard legal battles under the NAGPRA law. Found accidentally in the northwestern state of Washington, it was an adult male showing many healed fractures and a Transitional/Early Archaic projectile point embedded in its iliac (fig. 25). It is not the oldest specimen, as its dating set at 9200-8400 RCYBP (J.C. Chatters 2004; J.R. Powell 2005). The list of relatively ancient remains continues with: Grimes Burial Shelter, 9700 RCYBP and Spirit Cave mummy, 9040 RCYBP, both from Nevada (J.R. Powell 2005; D.W. Owsley, R.L. Jantz 1999); Pelican Rapids, Minnesota, 7840 RCYBP (idem); Whitewater Draw, Arizona, 10,000-8000 RCYBP (J.R. Powell 2005; G.D. Steele, J.R. Powell 2002); Gordon Creek, Colorado, 9700 RCYBP (J.R. Powell 2005), Midland site and Wilson-Leonard Burial II, Texas, possibly both from 11,500 RCYBP (idem; E.J. Dixon 1999); Rancho La Brea, 9000 RCYBP, and Arlington Springs, 11,000 RCYBP, California (idem); Little Salt Springs and Warm Mineral Springs, Florida, 10,000 RCYBP, and finally the On Your Knees cave, Prince of Wales island, Alaska, about 9700 RCYBP (idem).

Three finds in USA are part of the oldest coherent bioarchaeological record. The Anzick burial of a two-year old infant was thought of as the only known Clovis individual. But this discovery in Montana, dated at 11,200 RCYBP, represents a mixed, non-primary context and it was not scientifically excavated (fig. 25). It contains associated Clovis artefacts: more than a hundred stone and bone implements, with red ochre that could have covered the dead and offerings (J.R. Powell 2005; J.E. Morrow, S. Fiedel 2006a, 2006b). The inclusion of red ochre continued 1000 years later, with Arch Lake Woman, New Mexico, a skeleton accompanied by talc beads, bone and stone tools, from 10,200 RCYBP (D.W. Owsley et alii 2010) (fig. 25). Older than this, related with the Western Stemmed Tradition, the young woman buried with artefacts at Buhl, Idaho, died around 10,670 RCYBP (J.R. Powell 2005; E.J. Dixon 1999). In South America, several human remains are situated in the Transition period between the Pleistocene and the Holocene. The most important is the adult female (“Luzia”) from Lapa Vermelha (Lagoa Santa, Brazil), not older than 12,000 cal BP (J.R. Powell 2005; G.D. Steele, J.R. Powell 2002).

Mexico has some of the oldest known skeletal remains on the continent (figs. 25, 27). Unfortunately, none of them was found associated with artefacts, so there is no way to know their cultural affiliation. Also, they are all fortuitous finds, not discovered during systematic digs. The oldest

² NAGPRA means “Native American Graves Protection and Repatriation Act”. It is a federal law introduced in the United States in November 1990 and it implies that any native tribes have the right to claim as their own the ancient human remains discovered accidentally or within archaeological projects and re-bury them according to their own traditions. The most negative aspect of this law consists in that it does not specifically include the right of the scientists to study the remains before being re-inhumated.

specimen, radiocarbon-dated and accepted by the wider academic community, is the young woman known as the Peñón III Woman, found in Mexico City. Its age is set at $10,755 \pm 55$ RCYBP, meaning around 12,800 cal BP, at the onset of the Younger Dryas cold period. Close to its age, an isolated skull from the site of Tlapacoya (unfortunately not found in excavation by the Lorenz'o's team, but by construction workers near the site, perhaps in one of the caves that face the modern highway: fig. 28), dated to $10,200 \pm 65$ RCYBP, during the same climatic reversal. The Peñón III woman, at least, died during a plinian eruption of Popocatepetl volcano, at the same time with two other specimens dated by tephrochronology applied to the volcanic ash adhered to them: the Chimalhuacán Man and the Balderas Underground male skull, both from Mexico City, as well (S. González et alii 2003, p. 381; 2006, p. 70,74; J.A. Pompa y Padilla 1988, 2006; J.C. Jiménez et alii 2010). In recent years, amateur divers found human skeletons in a submerged cave system on the eastern coast of the Yucatan Peninsula. During the Pleistocene, the Caribbean Sea was many kilometres away, when the sea level was low. Posteriorly, the caves got inundated and human and animal remains were trapped inside. Archaeologists intervened and studied some of the bones, more than one skeletons presenting interest for the discussion here (A. Terrazas, M.E. Benavente 2006; A.H. González et alii 2006, 2008). The finds have not been entirely published yet, but preliminary informations indicate that the young adult woman from the Chrystal Cave might be 11,600 radiocarbon years old, potentially pre-Clovis. Another important specimen, a nearly complete young woman from the Hoyo Negro chamber, was dated at about 13,000-12,000 cal BP and yielded DNA results that seem to confirm the arrival of her ancestors from Beringia (J.C. Chatters et alii 2014). These data place these two "first Mexicans" among the oldest human beings known so far in the Western Hemisphere.

◆ Subsistence and mobility

Early Paleoamericans were generalised foragers. This new paradigm implies three lines of argumentation. First, they were not specialised and exclusive megafauna killers (they did not live on mammoth meat only); second, they exploited a very wide spectrum of resources, either food or raw materials; and third, they covered vast territories procuring goods, trading, social networking, adapting to a variety of niches and ecosystems.

Hunting proboscideans (mammoths, mastodons, gomphotheres) was indeed a cultural practice in the early phases of the first Americans, no doubt about that. But it was a rare behaviour; elephants were not an exclusive resource, not even a favourite one. The "specialised" and the "overkill" models are no longer sustained. There seems to be a specific relationship between this cultural custom, particular geographic regions and specific groups. There is a relatively high incidence of the practice in the Great Plains, Great Basin, parts of eastern North America, with a high concentration of kill-sites in southwestern USA. In other regions, such a practice is much less common or absent. On the other hand, proboscideans and many other large-bodied species maybe disappeared in North America at the onset of the Younger Dryas cooling event or during that event. So, most of the archaeological record involving the hunt of megafauna is restricted to the Clovis period: a Clovis-only fashion. The importance of these animals as chronological markers for the Pleistocene biased the objective knowledge, kill-sites being much more evident during surveys and preferred for study over other contexts whose subsistence indicators looked less promising. The discussion on megafauna hunting includes the large bison kills becoming increasingly common in post-Clovis times, with the Plains complexes adapting to the communal hunting of hundreds of animals, through diverse cooperative techniques. Even so, the archaeological reality speaks today of a very different socio-economic landscape: foraging, diversity and adaptability.

Several characteristics are shared by the Paleoamerican foragers from pre-Clovis to Holocene (even historic) times, all over the hemisphere: subsistence adapted to the particularities of each region or locality; wide hunting spectrum, including herbivores, small mammals, reptiles, amphibians, rodents, fish and an impressive reliance on birds and waterfowl; low weight of megafauna meat in the diet, compared to other resources; high importance of plant gathering and processing, like nuts, seeds, fruits, roots, on the same levels as in the Holocene; seasonality and relatively low mobility related to food procurement versus high mobility related to trade and social networking. This scenario is supported by data from a great variety of sites all over North and South America and across all considered historic intervals (see F. Wendorf, J.J. Hester 1962; R.L. Kelly, L.C. Todd 1988; L.C. Todd et alii 1990; M.F. Seeman 1994; P.L. Storck, A.E. Spiess 1994; D. Meltzer 2002, 2009; T. Dillehay, J. Rossen 2002; D.F. Overstreet 2005; M.B. Collins 2007; R.J. Dent 2007; J.S. Dunbar, P.K. Vojnovski

2007; K.D. Hollenbach 2007; M. Kornfeld 2007; S.R. Kuehn 2007; R.B. Walker 2007; B.N. Andrews et alii 2008; T. Dillehay 2000).

Nevertheless, the Ice Age was an epoch of large-bodied animals and humans were people of their times (V. Geist 2005). The procurement of mega-mammals was a real practice and had several purposes: obtaining meat, hide, sinew and bones or ivory for artefacts, clothing and shelter, and probably social and ritual ends (B.A. Bradley, M.B. Collins 2013). It manifested in several ways: hunting live free animals, killing weakened or trapped specimens, driving herds into traps, scavenging carcasses, quarrying bone and storing meat in the form of caches (R. Bonnichsen, M.H. Sorg 1989; F. Solórzano 1989; E.J. Dixon 1999; G. Haynes 2002; D.C. Fisher 2004; E. Johnson 2005; G. Frison 2004; C.V. Haynes, B.B. Huckell 2007). Killing proboscideans was not such a complicated task, as often believed. Humans are able to hunt any sort of animal if the correct strategies are applied, without the need to rely on bogged places or sick individuals, as clearly shown by G. Frison (2004). The difficulty of the hunt is not the matter here, but this: the relative scarcity of proboscidean killing events (in spite of the opposite general impression), the amount of meat such kills imply and the high incidence of abandonment of carcasses and under-exploitation observed in the butchering events, with intact bodies and unused parts. This is also valid for the massive bison kills from the after-mammoth periods.

So, the final question about subsistence strategies is: if we already know that the Pleistocene Americans were generalised foragers relying mainly on other resources, why did they hunt mammoth and bison in large numbers without using the entire meat available and abandoning large volumes of the obtained prey? In my opinion, the answers are: a) megafauna killings were seasonal, social events, meant to provide food for large social/tribal gatherings, a scenario for social bonding; and/or b) mammoth kills were rare ritual hunts reserved for the initiation of young adults, according to traditions and beliefs that will never be known.

◆ Peopling of the Americas and the “zombie models”

A Mexican colleague wrote: “The narrative of the First Americans is still a very speculative stage, although some narratives are more testable than others” (G. Sánchez 2010, p. 21). This is mostly the case when debating the time, entering routes and mobility of the earliest settlers into and throughout the continent during the initial ‘colonisation’ process, “an ecological event of enormous magnitude” (N. Jablonski 2002, p. 3). The space here does not allow details and the complexity of the debate can be appreciated elsewhere (E.J. Dixon 1999; T. Dillehay 2000; D. Stanford et alii 2005; D. Meltzer 2009; R. Bonnichsen, K.L. Turnmire 2005a, 2005b). This is a review of the major models proposed for this process and a discussion of some aspects from my own perspective.

Today, parallel approaches are employed in the search for the origins of the earliest newcomers. Linguistics, glottochronology, genetics and bioarchaeology seem to converge in the idea that everything started in Beringia (A.C. Roosevelt et alii 2002; C.G. Turner II 2002; S. Fiedel 2006b; A.M. Haeussler 2004; T. Goebel et alii 2008). But these theories are based on the study of evidence that does not belong to the period in discussion and forcefully assume the validity of untested assumptions (R. Bonnichsen 1999b; R. González-José et alii 2005). More efforts have been made to understand the environmental conditions of Eastern Beringia for the supposed time of the first arrivals across the Land Bridge, than for any other region (S.A. Elias 2002; D. Yesner 2007). The archaeological evidence still fails to definitive proof for a pristine and unique entry by land through that point. Today, science prefers the posture of multiple waves of arrival, in order to explain both the initial peopling and the subsequent cultural and genetic diversity (R. Bonnichsen 1999b; D. Meltzer 1989; M. Faught 2008; D. Stanford et alii 2005). “Multiple waves” is a tricky concept and can be interpreted in several ways: it can either mean simultaneous entries of distinct populations, successive migrations of groups following the same or different routes or completely separate events occurring at great distances in time. It is possible that migrations commenced very long time ago and many other pioneering populations died out, went extinct, remaining invisible in the archaeological record (N. Jablonski 2002). It is true that the “Clovis-first” model is dead, but that should not automatically allow exaggeratedly old dates for the initial peopling without criticism and supporting evidence, as some did (A. Bryan, R. Gruhn 1989). A model that does give theoretical cohesion to the peopling of the continent is the concept of “adaptive radiation”, employed by Michael B. Collins (M.B. Collins 2012; cf. B.A. Bradley, M.B. Collins 2013).

There are three basic models for the initial peopling of the Americas: a) the inner route across the continental landmass, implying "colonisation" by land from Eastern Beringia to the territories south of the Laurentide and Cordilleran ice sheets; b) the Pacific coast route, supposing either walking along the coastline or travelling by watercrafts, bordering the shores; c) the North Atlantic route, with European Solutrean people seafaring across the ocean (fig. 26). Anderson and Gillam discuss these models and synthesise a series of options of demographic movement to the interior of the continents (D.G. Anderson, J.C. Gillam 2000).

The first option - a priori assuming the first touch point in Alaska - is centred on a crucial argument: it requires an opening between the two large continental ice sheets to allow people to pass southwards, the so-called "Ice-free corridor", which is believed to have opened around 12,000-11,500 RCYBP (fig. 4). If so, Clovis progenitors (probably Nenana groups) migrated through the long and very narrow passage between the immensely tall ice walls, subsisting on waterfowl and resources found around the young periglacial lakes, then flowed into the nowadays' United States, giving birth to the first cultures and, eventually, to Clovis and the rest of ancient societies all over the hemisphere (fig. 26/A, B). For those searching Clovis' ancestry in Beringia, this model is crucial (T.G. Schurr, D.C. Wallace 1999; C.V. Haynes 2005; M.C. Wilson, J.A. Burns 2005; S. Fiedel 2007).

The second option is related to the concept of maritime adaptations and also implies origins in Asia (fig. 26/C). If people took the coastal route, they had to be used to coastal environments, dominating seafaring technologies. If conservative views doubt about that (S. Fiedel 2007; T.D. Hamilton, T. Goebel 2005), others, using archaeological data and ethnographic analogies, consider it as an objective reality (R. Gruhn 1994; J.M. Erlandson 2002; M.A. Jodry 2005). South America has its variant, envisaging both oceanic shores, known as the "aquatic environments model", with people moving along the coast and exploring "eco-refuges" inlands, along the river valleys (L. Miotti 2004, 2006; L. Miotti et alii 2011).

The cross-Atlantic alternative has increased in strength and stabilised during the last decade as a viable theory (B.A. Bradley, D. Stanford 2004, 2006; D. Stanford, B.A. Bradley 2002, 2012). It is based on striking and undeniable technological and formal similarities between the Clovis culture and the Late Palaeolithic Solutrean counterpart in Europe. Coast-adapted Solutreans, using specialised watercraft, could have reached northeastern America during or shortly after the Late Glacial Maximum (fig. 26/C). The hypothesis has been strongly questioned by some peers (L.G. Straus 2000; L.G. Straus et alii 2005; T. Goebel et alii 2008; M. Kornfeld, A. Tabarev 2009) and supported by others (M.B. Collins 2005; C. Yahnig 2004; C.R. Moore 2012; C. Runnels 2012).

Any of these proposals could reflect the reality, maybe all at the same time. But crossing the Atlantic, crossing the Pacific, sailing along new shores or roaming across uninhabited and strange lands, all require some sort of justification and motivation. There are two models describing manners in which mobile populations would move through space: the "string-of-pearls" model and the "leap-frog" one. The first supposes a progressive move, with adjacent territories invading space after fissioning of groups and exhaustion of resources. The second implies long-distance "jumps" from one to the next settled territory, with culturally empty spaces left between (D.G. Anderson, J.C. Gillam 2000).

All these theoretical constructions are internally coherent and sound logical to the reader. But I question one specific aspect: moving elsewhere needs a reason. This could be: accidental (cast-aways, in the case of seafaring), social pressure (conflicts between groups, demographic increase, territoriality and buffer zones), environmental pressure (termination of resources, cataclysms, unsuitable climate or dangerous predators) or, simply, human curiosity and a sense for exploration. But, if we do not resolve the circumstances in which demographic movements occurred, we shall remain with what I would call "zombie models": people simply moving forward, along the coasts, across open seas, through virgin lands, like a mass of zombies, mysteriously chasing for something, or acting like they knew there was something to reach farther away. We should even avoid terms as "colonisation" or "migration", because they inevitably imply a goal, a consciously assumed target. They were people who did not have knowledge of the territories they were about to reach, who lacked maps and aerial views of what there might be beyond the hill (D. Stanford et alii 2005; D. Meltzer 2002, 2009).

The strangest "zombie model" involves the ice-free corridor of western Canada. If the corridor was closed before 12,000 RCYBP, the older dates can only be explained by coastal entries. But, even if it opened much earlier, even if that was the only possible land route, let us imagine this: the corridor was only a few kilometres wide, maybe 40-80 km at its widest, cold, humid, lifeless, with terrible floods and gigantic ice walls at sight, which probably even opened first in the south and later

in the north; with scarce vegetation and hardly anything to eat, with fish and waterfowl needing centuries before being established in the new-born lakes. But even if it had been a rich land, why would have anyone, on the Alaskan end, decided to enter a never-ending tunnel of ice leading into nowhere? Does it have an end? What's on the other side? What about the social behaviour, traditions, customs, social rules, myths, legends and beliefs regulating people's acts? These thoughts and the lack of sufficient archaeological evidence along the corridor's trail make me see this scenario as unfeasible.

◆ Concluding remarks

In conclusion, one can only ask, like in the title of a classic paper: "why don't we know when the first people came to North America?" (D. Meltzer 1989). Perhaps, the first answer coming to one's mind would be: because the archaeology of the earliest people in the Americas is still at its beginnings; but also, because passions, egos, conflicts, excessive skepticisms or excessive enthusiasm affected the course of this field of research. And finally, because the first inhabitants of the American continents were relatively few in number and their shallow traces are almost invisible, spread as they are over an enormous and tricky geography.

A few final considerations might be helpful in bringing together the main ideas discussed among so much data clustered in the previous pages:

1. The archaeology of the peopling of the Americas and the first human occupations in the Western Hemisphere is a field of research that competes, at least in some of the Latin American countries, against much more influential and visually 'attractive' topics, such as the large monuments of Mesoamerica and the Andes, with much higher impact on tourism and financial income.

2. The early prehistory in the Americas is still today, one century after its pioneering discoveries, the stage for hard and passionate academic disputes, controversies and confrontations of paradigms. In the United States, the scientific debates of the late nineteenth century set up the conditions for more cautious, even skeptic-dominated points of view about the accuracy of the archaeological data contributed by scholars to the "Early Man" debate; on the other hand, in other countries, such as the case of Mexico, discoveries commenced to appear much later during the twentieth century, but the attitude of the explorers was much more liberal, often causing an excess of trust in inconclusive archaeological indicators, an non-critical and easy management of absolute dating and the announcement of conclusions based on poorly sustained data;

3. The use of stone tools lasted during most of the human history in the Americas, sometimes long after the European invasions and the establishment of the new political orders. That makes the archaeological record of the earliest societies become less evident at a first glance, diluted under an immense richness of cultures and lithic typologies;

4. The most widespread cultural-historical model in American prehistory, during its last nine decades of "official" existence, was the so-called "Clovis-first" model. This paradigm implies that the bearers of a particular lithic technology known as Clovis, radiocarbon-dated at ca. 13,500 – 13,000 cal BP in a wide variety of localities across North America, were the direct descendants of the first Homo sapiens sapiens hunter-gatherers who crossed into the continent over the Bering Land Bridge that existed during the last stages of the Pleistocene. They were conceived as highly mobile groups, particularly interested in the hunt of now-extinct Ice Age proboscideans, moving fast across the entire continent and peopling both halves of the hemisphere. In retrospective, this model proved to be something that haunted mainly the academic environment of the United States and it has never meant a serious paradigm to scholars in Mexico and South America;

5. Two massive ice sheets, the Laurentide and the Cordilleran, covered the entire northern part of North America during the Ice Age, practically blocking the passage of living beings between the unfrozen Alaska and the rest of the continent. It is still debated whether the so-called "ice-free corridor" opened between the two ice caps soon enough in order to make the terrestrial peopling from Asia a reliable model;

6. It is now widely accepted that the earliest inhabitants of the Americas were not specialised megafauna hunters; they were rather generalised foragers and the proboscidean kill-sites are restricted to particular regions of the United States (mainly in the south and southwest), within Clovis territories, with very few such cases in the rest of the hemisphere;

7. The "Clovis-first" paradigm is now obsolete and one can hardly meet archaeologists still sticking to the old model. Today, the scientific battle moved into the even more disputed field of the

“pre-Clovis” controversies; a new reference point has been set at around 11,500 RCYBP, taking into account a media of the earliest known Clovis dates. “Were there people in the Americas before Clovis” is not a valid question anymore; the new “Holy Grail” of the American archaeology is how long before Clovis we can document an indisputable human presence;

8. It is apparent that Clovis people were not alone during their historical period and they may have interacted with a variety of other groups. It is still not possible to say whether “the others” were descendants of earlier arrivals or completely different societies with a different origin. The archaeological record in the United States is very different from one in Mexico and from the discoveries in South America, one simply cannot expect to find the same artefact typologies everywhere; it is likely that the continent was occupied by a large variety of archaeological cultures before the end of the Pleistocene (let's say before the end of the Younger Dryas cooling interval at about 11,700 cal. B.P.);

9. In North America, the earliest archaeological sites (candidates for an older-than-Clovis population) cluster in the east and northeast of the United States, in places like Meadowcroft Rockshelter, Chesapeake Bay, and Cactus Hill. Current investigations are analysing the possibility of “pre-Clovis” occupations in the west, within the Great Basin and the Pacific coast. In Mexico, several sites have provided extremely old dates, but their validity is still under discussion. South America has the earliest indisputable human settlement in the New World: Monte Verde, in Chile. The most conservative opinions situated the older-than-Clovis occupations at no more than 12,800 RCYBP (about 15,000 cal BP), while other specialists tend to consider the earliest arrivals twice that old;

10. The origin of the First Americans is still a mystery and no model can be considered as confirmed yet. The most common one states that the origin of the American cultures was Asia – Siberia, in particular – with two migration routes suggested, an inland one (through the “ice-free corridor” of Western Canada) and a coastal route, by seafaring. Other, more recent, theories suggest an income of people from the East, from Western Europe (perhaps Solutreans who touched ground in the northeast of the continent as early as the Late Glacial Maximum). For the case of South America, there is an increasing feeling that the peopling there represented a completely separate phenomenon, not related to the ‘conquest’ of the North. I personally prefer the hypothesis that the peopling of the Americas was a complex process, consisting of multiple entries from multiple directions.

◆ Epilogue

There is no evidence to support the belief that the very first people who actually discovered America for the first time were ethnically (or genetically) the same as later populations, such as the Clovis, Folsom, Plainview or even the same as the earliest occupants already documented for the eastern United States or southwestern South America. The question of “who were the Clovis people?” is not at all the same as asking, “who were the first inhabitants?”. The linear view linking the archaeologically known cultures to the original settlers has no scientific or obliged support. The very first people who stepped on American land may well have been groups who came from a variety of places, at a very remote moment in time, and they could have disappeared, they could have died out without lasting long into the archaeological record; and we are still unable to find their trace. Later people could have been unrelated, secondary migrations. Saying that the First Americans came from the sea, perhaps even across the Atlantic or seafaring over the Pacific, is no contradiction – in essence – with the officially accepted theories about the origins of Clovis or other established cultures.

Very recently, an already famous paper produced a new revival of the debates. A team of scientists announced the results of genome analysis of the only Clovis-related funerary context known so far, the Anzick burial in Montana, USA (M. Rasmussen et alii 2014). The remains of an infant were inhumated at the base of a cliff about 12,600 calendar years ago, at the very end of the Clovis era. Many Clovis artefacts surrounded him, covered in red ochre. The DNA results indicate that the young individual was genetically related to the majority of the Native Americans living today and his origins can be quite surely traced back to Asia. That seems to be a valid and remarkable discovery, perhaps even a definitive argument in favour of the Siberian origins. However, in my opinion, the only thing I personally understand from these results is that the lineage of that particular child came from Asia. It does not mean that the entire Clovis population originated up there, as there is no evidence to assume that all users of Clovis technology were ethnically, genetically or linguistically alike. And even if they were, even if the Anzick child was one of the last members of a proper Clovis “nation”, the

DNA results would only tell us about the Asian origins of Clovis alone, but solve nothing at all about the still mysterious origins of the very first Americans.

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Era	Geologic period	Chronology (Ma BP)
Quaternary	Holocene	0.01 - present
	Pleistocene	2.6 - 0.01
Tertiary	Pliocene	5.5 - 2.6
	Miocene	22.5 - 5.5
	Oligocene	38 - 22.5
	Eocene	55 - 38
	Palaeocene	65 - 55

Fig. 1. The main geologic periods of the Tertiary and the Quaternary, following the end of the Cretaceous Era. The Pleistocene (or the Ice Age) started 2.6 million years ago (not 1.8 million as it has been traditionally known) and it ended about 10,000 years ago, when the actual warmer stage (the Holocene) commenced. The Pleistocene and the Holocene form together the Quaternary Epoch (data compiled after M. Williams et alii 1998; J.J. Lowe, M.J.C. Walker 1997. Image modified from C.F. Ardelean 2013, p. 73, tab. 3).

Principalele perioade geologice ale Teriarului și Cuaternarului, urmând finalului Ereii Cretacice. Pleistocenul (sau Epoca de Gheață) a început în urmă cu 2.6 milioane de ani (și nu cu 1.8 milioane, cum se considera în mod tradițional) și s-a sfârșit în urmă cu aproximativ 10,000 de ani, când a început actuala fază mai caldă Holocenul. Pleistocenul și Holocenul, formează împreună Epoca Cuaternară (informații după M. Williams et alii 1998; J.J. Lowe, M.J.C. Walker 1997. Imagine modificată din C.F. Ardelean 2013, p. 73, tab. 3).

Holocene		Chronology (Ka)	
Late Pleistocene	Wisconsin Stadal	Late Wisconsin	35-10
		Middle Wisconsin	65-35
		Early Wisconsin	79-65
		Edwisconsin	122-79
Late Middle Pleistocene	Sangamon (inter-stadial)		132-122
	Illinoian (stadial)		302-132
Middle Pleistocene	Pre-Illinoian		26000 - 302
Early Pleistocene			

Fig. 2. The general chronological, traditional scheme of the Pleistocene in North America, which concludes with the Late Wisconsin glacial stage, comprising the Late Glacial Maximum, around 22,000 years ago. This is the only geological interval that witnessed the presence of humans on the continent, as it is known so far. Earlier stadials and interstadials (such as Nebraska, Aftonian, Kansas and Yarmouthian, not reflected in this scheme anymore) are no longer in use as separate stages and they are all gathered within the Pre-Illinoian. In fact, the current tendency is to abandon these terminologies and replace the names of the glacial and inter-glacial periods with alphanumeric codes correlated with the isotope stages from the Arctic and Antarctic ice cores (based on data from M. Williams et alii 1998, p. 79, fig. 3.8; J.J. Lowe, M.J.C. Walker 1997. Image modified from C.F. Ardelean 2013, p. 74, tab. 4).

Schema cronologică generală, tradițională a Pleistocenului din America de Nord, care se termină cu stadiul glaciatic Wisconsin Târziu, în care se include Ultimul Maxim Glaciatic, acum vreo 22,000 de ani. Acesta (Wisconsin) este unicul interval geologic care a fost martor prezenței ființelor umane pe continent, din care se știe până acum. Stadiile și interstadiile mai vechi (precum Nebraska, Aftonian, Kansas și Yarmouthian, care nu se mai reprezintă în modelul de față) nu mai sunt în uz, fiind toate reunite sub numele de Pre-Illinoian. De fapt, tendința actuală este să se renunțe la folosirea acestor denumiri din imagine, și să se folosească pentru diferitele stadii glaciare coduri alfanumerice corelate cu stadiile izotopice din nucleii de gheață obținuți din zonele arctice și antarctice (informații bazate pe M. Williams et alii 1998, p. 79, fig. 3.8; J.J. Lowe, M.J.C. Walker 1997. Imagine modificată din C.F. Ardelean 2013, p. 74, tab. 4).

PERIOD Chronology (calendar years before present)		
Historic		300 - ...
Late Prehistoric		1,200 - 300
Transitional Archaic		2,000 - 1,200
Archaic	Late	3500 - 2,000
	Middle	6/5,000 - 3,500
	Early	9/8,000 - 6/5,000
Paleoindian (or Paleoamerican)	Late	11,000 - 8,000
	Middle	13,500 - 11,000
	Early	>16,000 - 13,500

Fig. 3. The simplified general chronological model of the North American prehistory, as commonly employed mostly in the United States of America. The ages are approximate and orientative, only. This model is rarely used by Mexican archaeologists (based on data from E.S. Turner, T.R. Hester 1999; D.G. Anderson 2005 and others. Modified from C.F. Ardelean 2013, p. 75, tab. 5).

Modelul cronologic general simplificat al preistoriei Americii de Nord, așa cum este de obicei folosit în Statele Unite ale Americii. Datele perioadelor sunt aproximative și doar orientative. Acest model este rar utilizat de arheologii din Mexic (bazat pe informații din E.S. Turner, T.R. Hester 1999; D.G. Anderson 2005 și alii. Imagine modificată din C.F. Ardelean 2013, p. 75, tab. 5).



Fig. 4. Contours of North America showing the two large ice sheets that covered the continent during the Wisconsin glaciation (the Laurentide in the east and the Cordilleran in the west), with the “ice-free” corridor, opened around 12,000 ca. B.P., marked between them. The lighter surfaces around the contour of the landmass indicate the extension of the ancient coast lines, when the sea levels were much lower than today. That allowed the exposure of vast territories of land, such as the Land Bridge that connected Alaska and Siberia, known as Beringia (after D. Meltzer 2009, p. 2, fig. 1; modified from C.F. Ardelean 2013, p. 78, fig. 14).

Harta cu conturul Americii de Nord care arată cele două mari calote glaciare care acopereau continentul în timpul epocii glaciare Wisconsin (calota Laurentide spre est și cea numită Cordilleran spre vest), cu “coridorul liber de gheață”, deschis înspre 12,000 cal BP, sugerat între ele. Suprafețele de culoare mai deschisă care înconjoară conturul Americii indică extinderea liniei de coastă, când nivelul oceanelor era mult mai jos decât astăzi. Aceasta a permis expunerea la suprafață a vaste teritorii, precum Podul Terestru care conecta Alaska cu Siberia, cunoscut ca Beringia (după D. Meltzer 2009, p. 2, fig. 1; modificat din C.F. Ardelean 2013, p. 78, fig. 14).



Fig. 5. Map showing some of the most important Clovis sites in North America (United States) (base map from www.freeworldmaps.net. Modified from C.F. Ardelean 2013, p. 76, fig. 12).

Harta cu unele dintre cele mai importante situri ale culturii Clovis în America de Nord (Statele Unite) (harta fizică de fond din www.freeworldmaps.net. Imagine modificată din C.F. Ardelean 2013, p. 76, fig. 12).

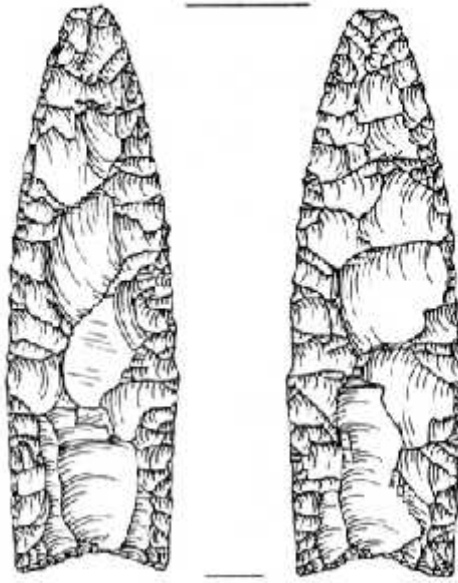


Fig. 6. The Clovis point type-specimen from Blackwater Draw, the first Clovis site near Portales, New Mexico, United States of America (modified from A.T. Boldurian, J.L. Cotter 1999, p. 59, fig. 25; taken from C.F. Ardelean 2013, p. 77, fig. 13).

Specimen tip al vârfurilor Clovis de la Blackwater Draw, primul sit Clovis descoperit lângă Portales, New Mexico, Statele Unite ale Americii (modificat după A.T. Boldurian, J.L. Cotter 1999, p. 59, fig. 25; preluat din C.F. Ardelean 2013, p. 77, fig. 13).



Fig. 7. A representative fluted-based Clovis-type biface from Blackwater Draw (photograph courtesy of Dr. George Crawford, Eastern New Mexico University in Portales, NM, United States).

Un vârf bifacial tipic Clovis, cu "flute" sau canal pornind de la baza artefactului, de la Blackwater Draw (fotografie cu acordul Dr. George Crawford, Eastern New Mexico University, Portales, NM, Statele Unite ale Americii).

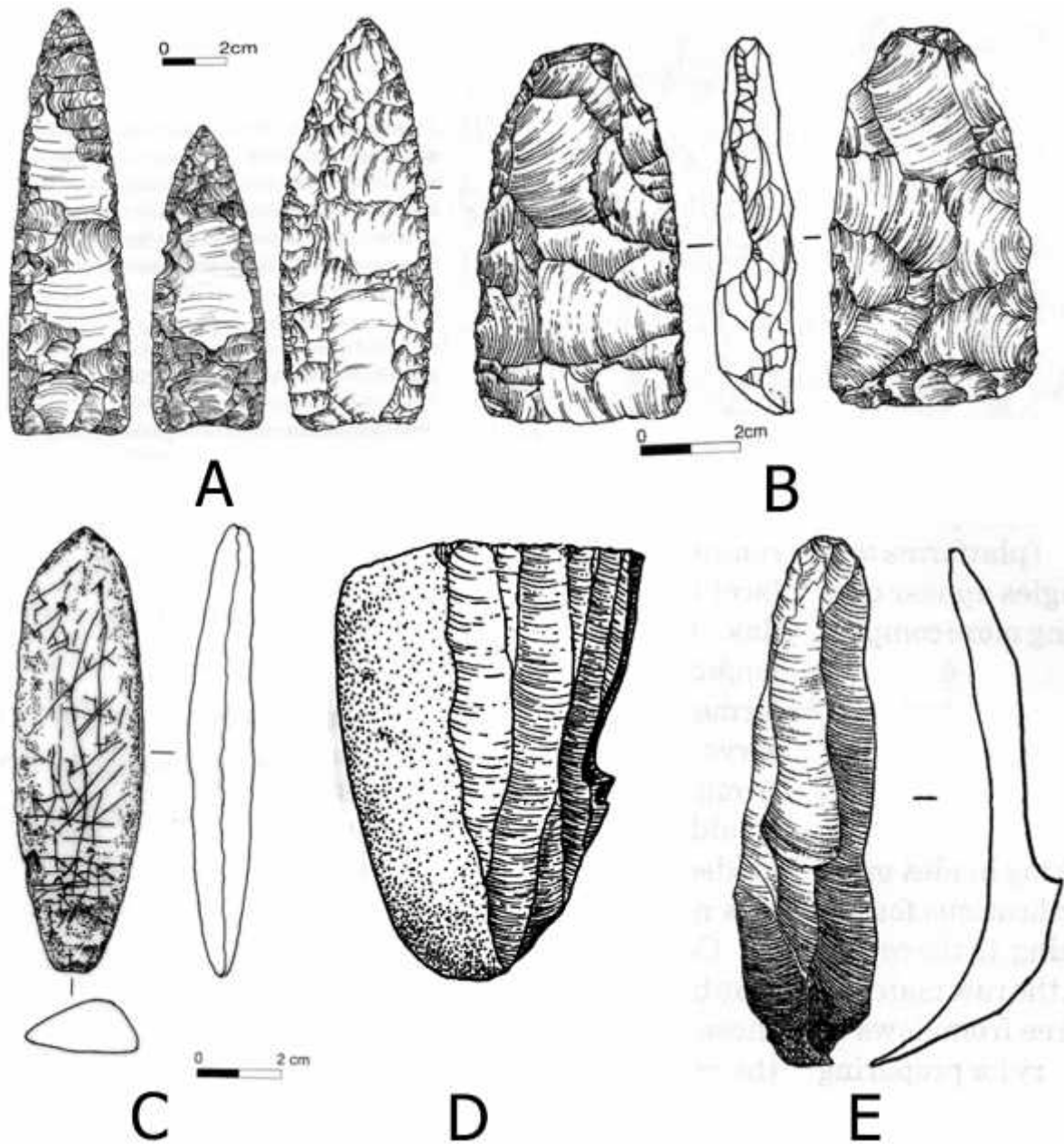


Fig. 8. Clovis stone artefacts: A) Clovis projectile points; B) adze; C) incised stone; D) blade core; E) blade. Artifacts are not at scale within the collage (modified from and based on D. Stanford, B.A. Bradley 2012; B.A. Bradley et alii 2010; image taken from C.F. Ardelean 2013, p. 80, fig. 16).
Artefacte Clovis din piatr : A) vârfuri de proiectil Clovis; B) tesla; C) roc cu incizii; D) nucleu de lamele; E) lamel . Artefactele nu sunt reprezentate la scara în cadrul colajului (modificat după i bazat pe D. Stanford, B.A. Bradley 2012; B.A. Bradley et alii 2010; imagine preluat din C.F. Ardelean 2013, p. 80, fig. 16).



Fig. 9. General, partial view of the Blackwater Draw Clovis type-site, New Mexico, United States, showing the landscape disturbed by the gravel quarrying activities that originally led to the discovery of the famous prehistoric culture. A building can be appreciated in the center of the image: it is the dome built in the main area of the site, sheltering the open excavation shown in fig. 10, where tourists and specialists can observe the concentration of bison bones from the after-Clovis, later Folsom levels (photograph by Dr. Ciprian F. Ardelean, 2014).

Vedere generală parțială a sitului Blackwater Draw, situl tip al culturii Clovis, în New Mexico, Statele Unite, arătând peisajul modificat în timpul activităților de extragere de pietriși nisip care inițial au dus la descoperirea celebrei culturi preistorice. În centrul imaginii se poate aprecia o clădire: este vorba despre edificiul construit deasupra zonei principale a sitului, acoperind suprafața deschisă care se vede în fig. 10, unde turiștii și specialiștii pot observa concentrația de oase de bizon aparținând nivelelor Folsom posterioare culturii Clovis (fotografie de Dr. Ciprian F. Ardelean, 2014).



Fig. 10. The author of the article standing next to the Folsom level open excavation in the interior of the dome at Blackwater Draw, New Mexico, United States (photograph by Dr. Rafael Suárez, 2014).

Autorul acestui articol lângă suprafața deschisă cu nivele Folsom din interiorul domului de la Blackwater Draw, New Mexico, Statele Unite (fotografie de Dr. Rafael Suárez, 2014).

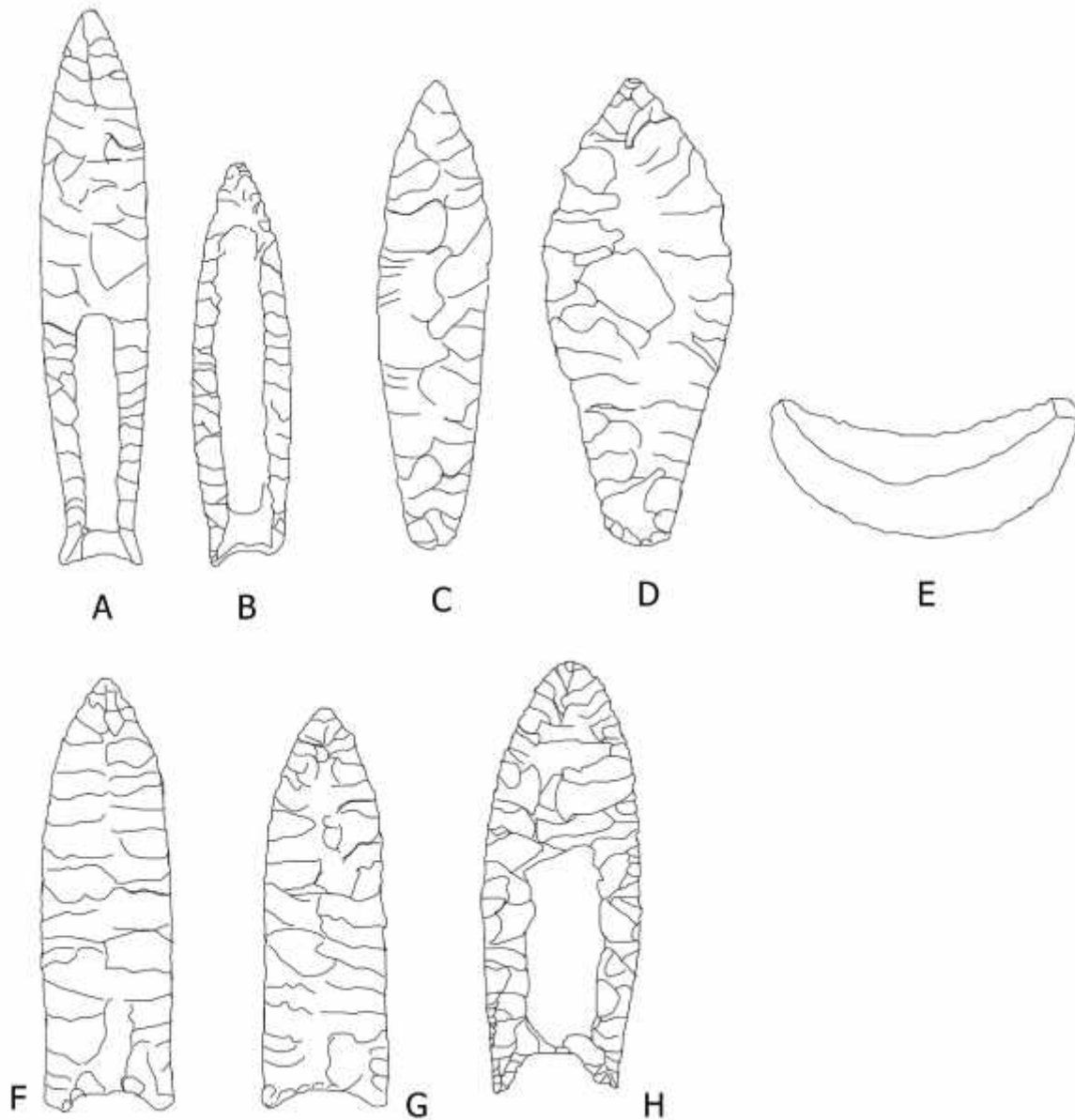


Fig. 11. Projectile point types contemporary with Clovis and post-Clovis: A) Cumberland, fluted (drawn after D. Stanford et alii 2005, fig. 5); B) Barnes, fluted (after idem); C) Western Stemmed Tradition (WST) point (after idem); D) WST point (after idem); E) WST crescent (after C. Beck, G.T. Jones 2010); F) Goshen (after D. Stanford et alii 2005, fig. 10); G) Plainview (after idem); H) Folsom (after A.T. Boldurian, J.L. Cotter 1999, p. 77, fig. 37) (Image taken from C.F. Ardelean, p. 83, fig. 17).

Vârful de proiectile de tipuri contemporane cu Clovis și post-Clovis: A) Cumberland, cu "flute" (după D. Stanford et alii 2005, fig. 5); B) Barnes, cu "flute" (după idem); C) vârf Western Stemmed Tradition (WST) (after idem); D) vârf WST (după idem); E) crescent WST în semilună (după C. Beck, G.T. Jones 2010); F) Goshen (după D. Stanford et alii 2005, fig. 10); G) Plainview (după idem); H) Folsom (după A.T. Boldurian, J.L. Cotter 1999, p. 77, fig. 37) (imagină preluată din C.F. Ardelean 2013, p. 83, fig. 17).

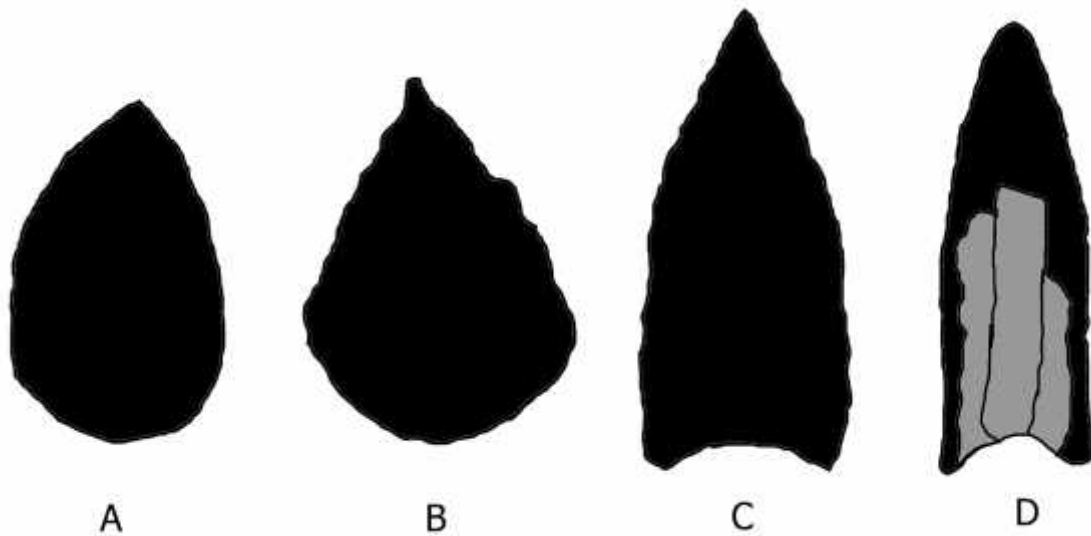


Fig. 12. Basic shapes of early Alaskan bifaces: A) and B) teardrop-shaped Nenana “Chindadn” points; C) Nenana concave-based point; D) Alaskan fluted point (based on artefacts from D. Stanford et alii 2005; D. Stanford, B.A. Bradley 2012. Collage taken from C.F. Ardelean 2013, p. 85, fig. 19).

Forme de baz de bifaciale timpurii din Alaska: A) i B) vârfuri tip “Chindadn” în form de lacrim , cultura Nenana; C) vârf Nenana de baz concav ; D) vârf cu “flute” din Alaska (forme bazate pe artefacte din D. Stanford et alii 2005; D. Stanford, B.A. Bradley 2012. Colaj preluat din C.F. Ardelean 2013, p. 85, fig. 19).



Fig. 13. Map with some of the most important early Alaskan sites, exponents of the Nenana complex (adapted from D. Stanford et alii 2005; base map from www. freeworldmaps.net. Modified from C.F. Ardelean 2013, p. 84, fig. 18).

Hart cu unele dintre cele mai importante situri timpurii din Alaska, exponente ale complexului Nenana (adaptat dup D. Stanford et alii 2005; hart de fond din www. freeworldmaps.net. Modificat dup C.F. Ardelean 2013, p. 84, fig. 18).

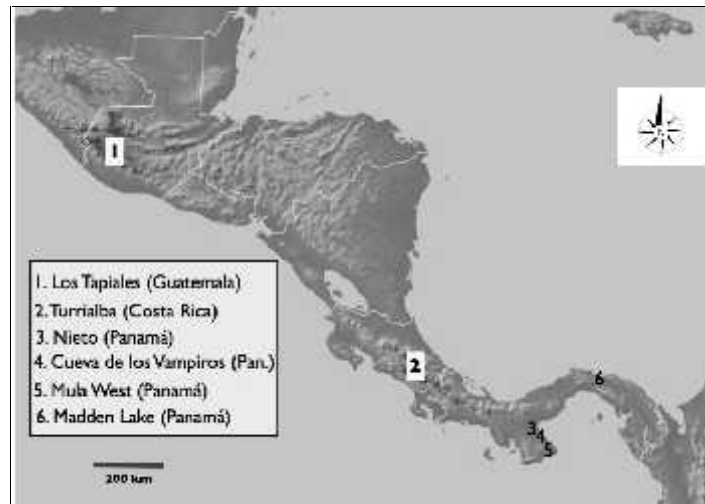


Fig. 14. Paleoamerican sites in Central America (base map from www.freeworldmaps.net. Modified from C.F. Ardelean 2013, p. 86, fig. 20).
 Situri Paleoamericane din America Central (hart de fond din www.freeworldmaps.net. Modificat dup C.F. Ardelean 2013, p. 86, fig. 20).



Fig. 15. The most important Paleoamerican sites in South America. The white squares indicate the earliest ones (base map from www.freeworldmaps.net; figure from C.F. Ardelean 2013, p. 90, fig. 22).
 Cele mai importante situri Paleoamericane din America de Sud. Numerele cu fond alb indic pe cele mai timpurii (hart de fond din www.freeworldmaps.net; preluat din C.F. Ardelean 2013, p. 90, fig. 22).

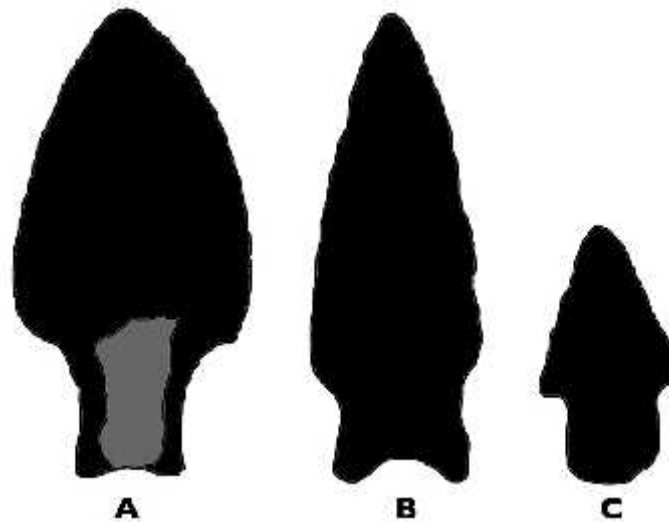


Fig. 16. Shapes of early South American points: A) fluted Fishtail point (after D. Stanford et alii 2005, fig. 13); B) Pay Paso point from Uruguay (after R. Suárez 2011b, p. 187); C) K87 – El Tigre point from Uruguay (after R. Suárez 2011, p. 192) (taken from C.F. Ardelean 2013, p. 88, 96; figs. 21, 28).
 Forme de vârfuri timpurii din America de Sud: A) vârf Fishtail (“Coad de pe te”) (dup D. Stanford et alii 2005, fig. 13); B) vârf Pay Paso din Uruguay (dup R. Suárez 2011b, p. 187); C) vârf K87 – El Tigre din Uruguay (dup R. Suárez 2011, p. 192) (preluate din C.F. Ardelean 2013, p. 88, 96, fig. 21, 28).

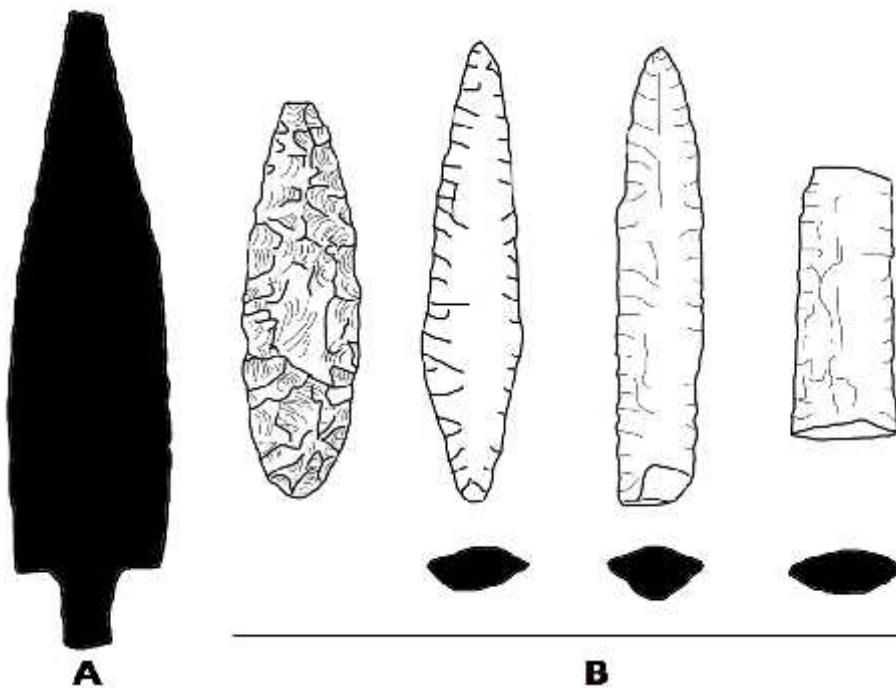


Fig. 17. Shapes of point types from South America: A) Paján point from Western South America (after D. Stanford et alii 2005); B) varieties of supposedly pre-Clovis El Jobo points (after D. Stanford et alii 2005; R. Gruhn, A. Bryan 1984, figs. 5.3) (taken from C.F. Ardelean 2013, p. 96, 103, figs. 29, 32).
 Forme de tipuri de vârfuri din America de Sud: A) vârf Paján din vestul Americii de Sud (dup D. Stanford et alii 2005); B) varietăți de vârfuri El Jobo, considerate de vârsta pre-Clovis (dup D. Stanford et alii 2005; R. Gruhn, A. Bryan 1984, fig. 5.3) (preluate din C.F. Ardelean 2013, p. 96, 103, fig. 29, 32).

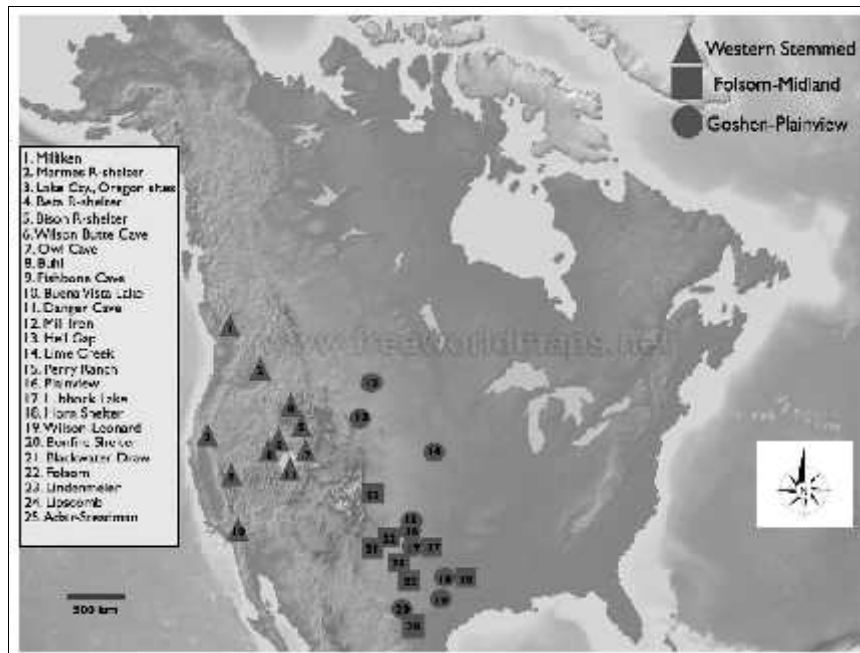


Fig. 18. Map showing the distribution of some of the most relevant archaeological sites belonging to the Western Stemmed Tradition, the Folsom-Midland culture and the Goshen-Plainview horizon (based on information from D. Stanford et alii 2005; map from www.freeworldmaps.net) (taken from C.F. Ardelean 2013, p. 92, fig. 23).
Harta con înând distribu ia geografic a unora dintre cele mai relevante situri arheologice apar înând tradi iei Western Stemmed, culturii Folsom-Midland i orizontului Goshen-Plainview (bazat pe informa ii din D. Stanford et alii 2005; harta de fond din www.freeworldmaps.net) (preluat din C.F. Ardelean 2013, p. 92, fig. 23).



Fig. 19. The characteristic landscape around Folsom, New Mexico, United States, in the vicinity of the type-site of the post-Clovis bison-hunting culture (photograph by Dr. Ciprian F. Ardelean, 2014).
Peisajul caracteristic din jurul localit ii Folsom, New Mexico, Statele Unite, în apropierea sitului tip al culturii vâ torilor de bizoni din epoca post-Clovis (fotografie de Dr. Ciprian F. Ardelean, 2014).

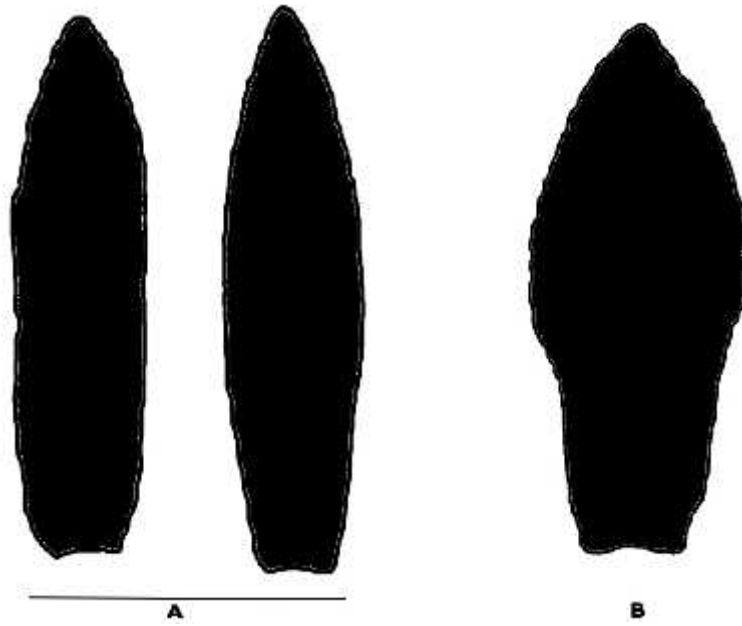


Fig. 20. Shapes of North American Paleoindian artifacts: A) Agate Basin points (after E.J. Dixon 1999); B) Hell Gap point (after E.S. Turner, T.R. Hester 1999) (collage after C.F. Ardelean 2013, p. 94, figs. 24-25).
Forme de baz de artefacte din America de Nord: A) vârfuri tip Agate Basin (dup E.J. Dixon 1999); B) vârf Hell Gap (dup E.S. Turner, T.R. Hester 1999) (colaj dup C.F. Ardelean 2013, p. 94, fig. 24-25).

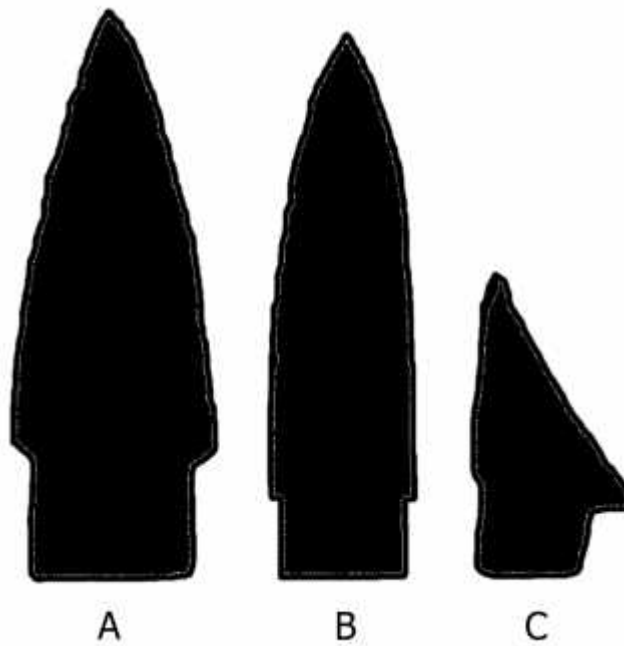


Fig. 21. Late Paleoamerican points from North America, belonging to the Cody Complex: A) Scottsbluff; B) Eden; C) Cody knife (based on E.J. Dixon 1999; E.S. Turner, T.R. Hester 1999) (image after C.F. Ardelean 2013, p. 95, fig. 26).
Vârfuri Paleoamericane târzii din America de Nord, apar înând complexului Cody: A) Scottsbluff; B) Eden; C) cu it Cody (conform E.J. Dixon 1999; E.S. Turner, T.R. Hester 1999) (preluat din C.F. Ardelean 2013, p. 95, fig. 26).

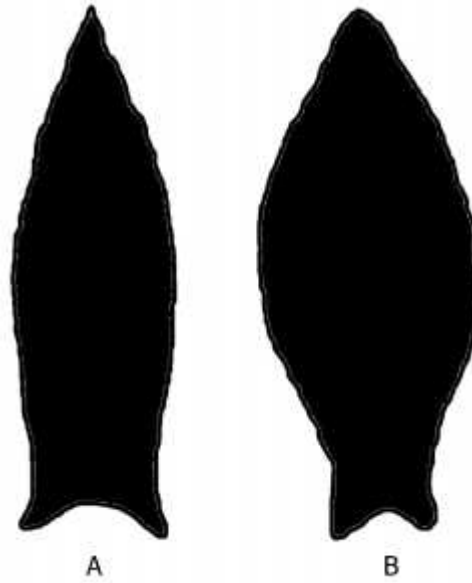


Fig. 22. Paleoamerican point types from Florida: A) Suwannee; B) Simpson (modified from J.S. Dunbar, A. Hemmings 2004, p. 67, fig. 1) (taken from C.F. Ardelean 2013, p. 95, fig. 27).
Vărfuri Paleoamericane din Florida: A) Suwannee; B) Simpson (modificate după J.S. Dunbar, A. Hemmings 2004, p. 67, fig. 1) (preluat din C.F. Ardelean 2013, p. 95, fig. 27).

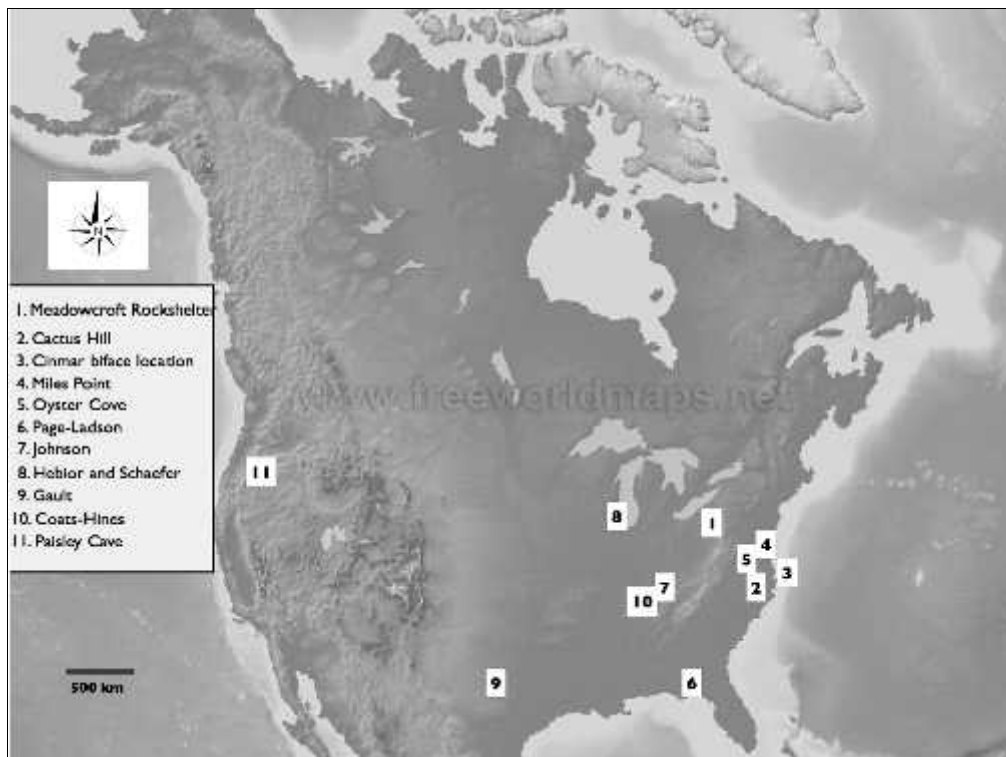


Fig. 23. Map of North America (excluding Mexico), with the location of the most important Pre-Clovis sites that provided more secure evidence. The majority concentrate in the eastern US (based on D. Stanford, B.A. Bradley 2012, p. 90, fig. 4.1; base map from www.freeworldmaps.net; figure taken from C.F. Ardelean 2013, p. 98, fig. 30).

Harta Americii de Nord (nu include Mexicul), cu poziția geografică a celor mai importante situri Pre-Clovis care au oferit evidențe mai credibile. Majoritatea se concentrează în estul Statelor Unite (bazat pe D. Stanford, B.A. Bradley 2012, p. 90, fig. 4.1; harta de fond din www.freeworldmaps.net; figura preluată din C.F. Ardelean 2013, p. 98, fig. 30).

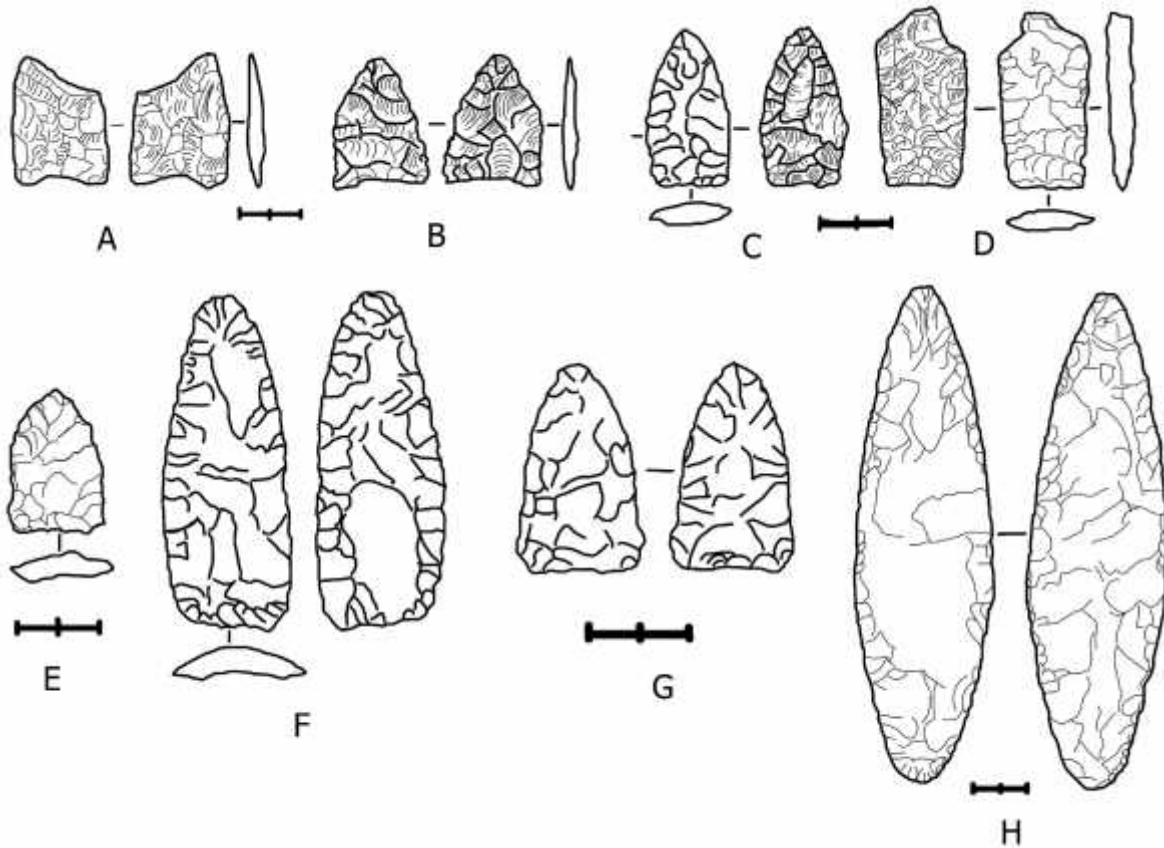


Fig. 24. North American flaked stone Pre-Clovis artefacts discovered in the United States: A) and B): Cactus Hill; C) and D): Meadowcroft Rockshelter; E) and F): Miles Point; G): Oyster Cove; H): the Cinmar biface. All scales have 2 cm (re-drawn from D. Stanford, B.A. Bradley 2012, figs. 4.3, 4.2, 4.4, 4.6 and 4.7; collage taken from C.F. Ardelean 2013, p. 101, fig. 31).

Artefacte de piatră cioplită Pre-Clovis din America de Nord descoperite în Statele Unite: A) și B): Cactus Hill; C) și D): Meadowcroft Rockshelter; E) și F): Miles Point; G): Oyster Cove; H): bifacial Cinmar. Toate scările au 2 cm (re-desenate pe baza a D. Stanford, B.A. Bradley 2012, fig. 4.3, 4.2, 4.4, 4.6 and 4.7; colaj preluat din C.F. Ardelean 2013, p. 101, fig. 31).

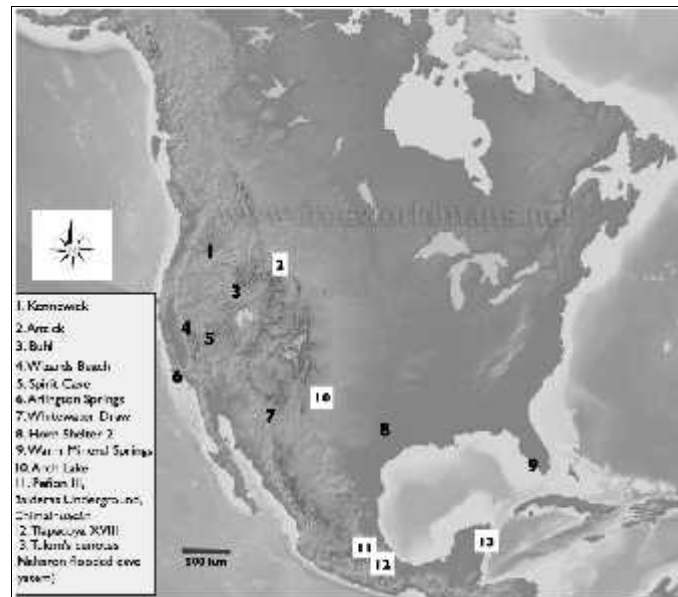


Fig. 25. Map of North America (including Mexico) showing the distribution of some of the most relevant discoveries of human remains of Late Pleistocene - Early Holocene age. The oldest ones are marked by white cases (after E.J. Dixon 1999; S. González et alii 2003, 2006; A.H. González et alii 2006, 2008; taken from C.F. Ardelean 2013, p. 105, fig. 33).

Harta a Americii de Nord (inclusiv Mexic) cu distribu ia geografic a unora dintre cele mai importante descoperiri de resturi umane datate pentru Pleistocenul Final–Holocenul Timpuriu. Cele mai vechi sunt marcate prin p trate albe (dup E.J. Dixon 1999; S. González et alii 2003, 2006; A.H. González et alii 2006, 2008; preluat din C.F. Ardelean 2013, p. 105, fig. 33).

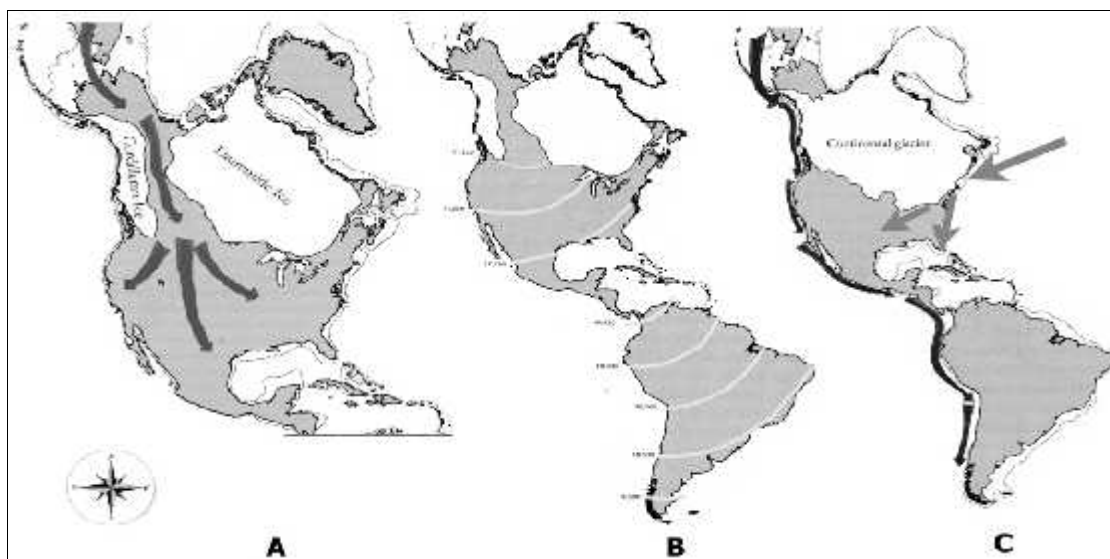


Fig. 26. The main models for the peopling of the Americas: A) the “classic” entry through Beringia and the migration through the “ice-free corridor”, the base for the “Clovis-first” paradigm; B) the “bow waves” spreading of the initial populations from north to south, in a fast movement that must have lasted less than a millennium; this is also linked to the “Clovis-first” and “Overkill” models; C) the alternative, maritime routes, before the opening of the ice-free corridor: the Pacific coast peopling, and the North Atlantic hypothesis, part of the “Solutrean connection” theory (base maps modified from E.J. Dixon 1999; figure taken from C.F. Ardelean 2013, p. 109, fig. 34).

Principalele modele pentru popularea Americilor: A) p trunderea “clasic ” prin Beringia i migrarea prin coridorul liber de ghea , baza modelului “Clovis first”; B) dispersarea în form de unde (“bow waves”) dinspre nord spre sud, într-o deplasare rapid care ar fi durat mai pu in de un mileniu; acest model este legat la rândul lui de modelele “Clovis first” i “Overkill”; C) rutele maritime, alternative, anterioare deschiderii coridorului f r ghia : popularea dinspre Pacific i popularea dinspre Atlanticul de Nord, parte a ipotezei cunoscute ca i “conexiunea Solutrean ” (harta de baz modificat din E.J. Dixon 1999; figur preluat din C.F. Ardelean 2013, p. 109, fig. 34).



Fig. 27. Map with the main prehistoric sites reported in Mexico. Only some of them are mentioned in the text (from C.F. Ardelean 2013, p. 72, fig. 11).

Harta cu principalele situri preistorice cunoscute în Mexic. Doar unele dintre ele apar menționate în text (din C.F. Ardelean 2013, p. 72, fig. 11).

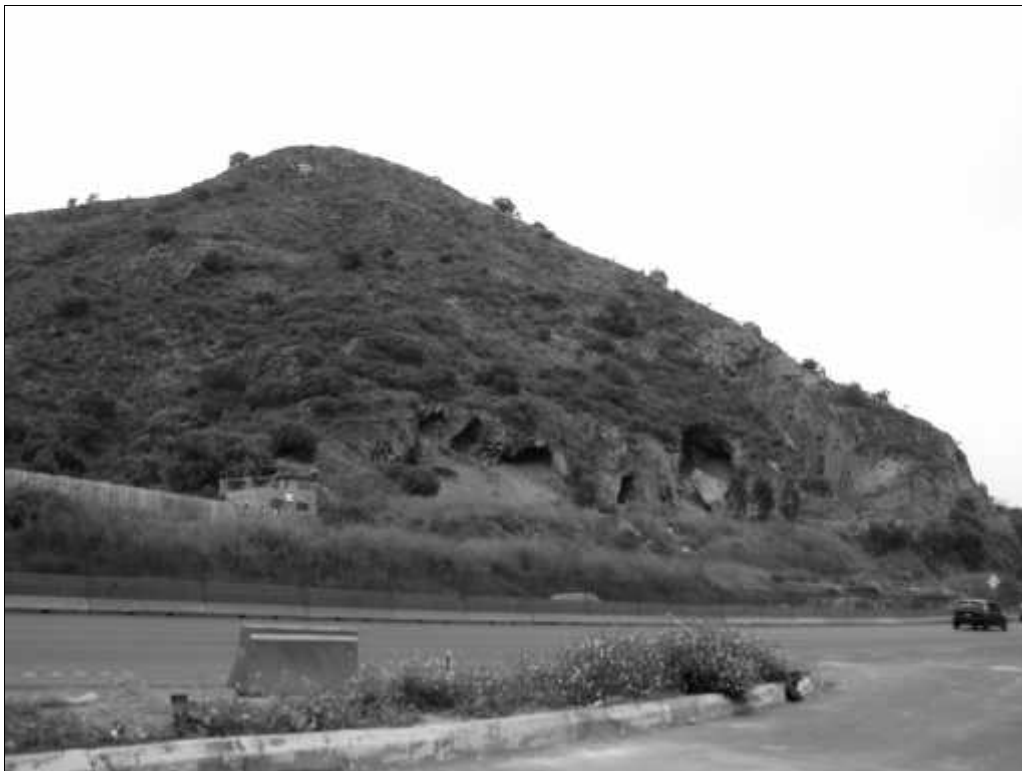


Fig. 28. The volcanic hill from Tlapacoya, in the south of Mexico City metropolis. A controversial site was excavated around it, considered by the Mexican traditional archaeology among the oldest in the Americas (photograph by Dr. Ciprian F. Ardelean, 2013).

Dealul vulcanic de la Tlapacoya, în sudul metropolei Mexico City. Un sit controversat a fost săpat în jurul lui, considerat în arheologia mexicană oficial printre cele mai vechi de pe continentul american (fotografie de Dr. Ciprian F. Ardelean, 2013).



Fig. 29. General view of Valsequillo site, near Puebla, Mexico, the centre for long disputes and controversies about the antiquity of human presence in the Americas. Recently, the waters of the Valsequillo dam have completely covered the location of the old archaeological excavations (photograph by Dr. Ciprian F. Ardelean, 2013).

Vedere general asupra sitului Valsequillo, lângă Puebla, Mexic, motiv de numeroase dezbateri și controverse în legătură cu vechimea prezenței umane în Americi. Recent, apele barajului de acumulare de la Valsequillo au acoperit complet locurile vechilor săpături arheologice (fotografie de Dr. Ciprian F. Ardelean, 2013).