



# Occupation of primordial “Brazil”

Evidence suggests that hunter-gatherers inhabited all major regions of Brazil roughly 10,000 years ago



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**A**round 10,500 years ago, almost the entire region that would later become Brazil was already inhabited by hunter-gatherer populations. From the Amazon to the Pampas, passing through the areas currently known as the Cerrado, Caatinga, and Pantanal, signs of human presence dating back at least 10 millennia have been found in all of the main Brazilian biomes. The only exception seems to be the Atlantic coast; the oldest and most reliable records suggest that *Homo sapiens* may have taken another 500–1000 years to reach the eastern shoreline of the continent. Three major traditional cultures known to have manufactured stone artifacts, such as scrapers, flakes, and arrowheads, had also settled in the eastern region of South America by approximately 10,000 years ago. Evidence of Umbu culture has been found in the south, the peoples of Lagoa Santa were in what is now the state of Minas Gerais, and Itaparica culture occupied parts of the Brazilian

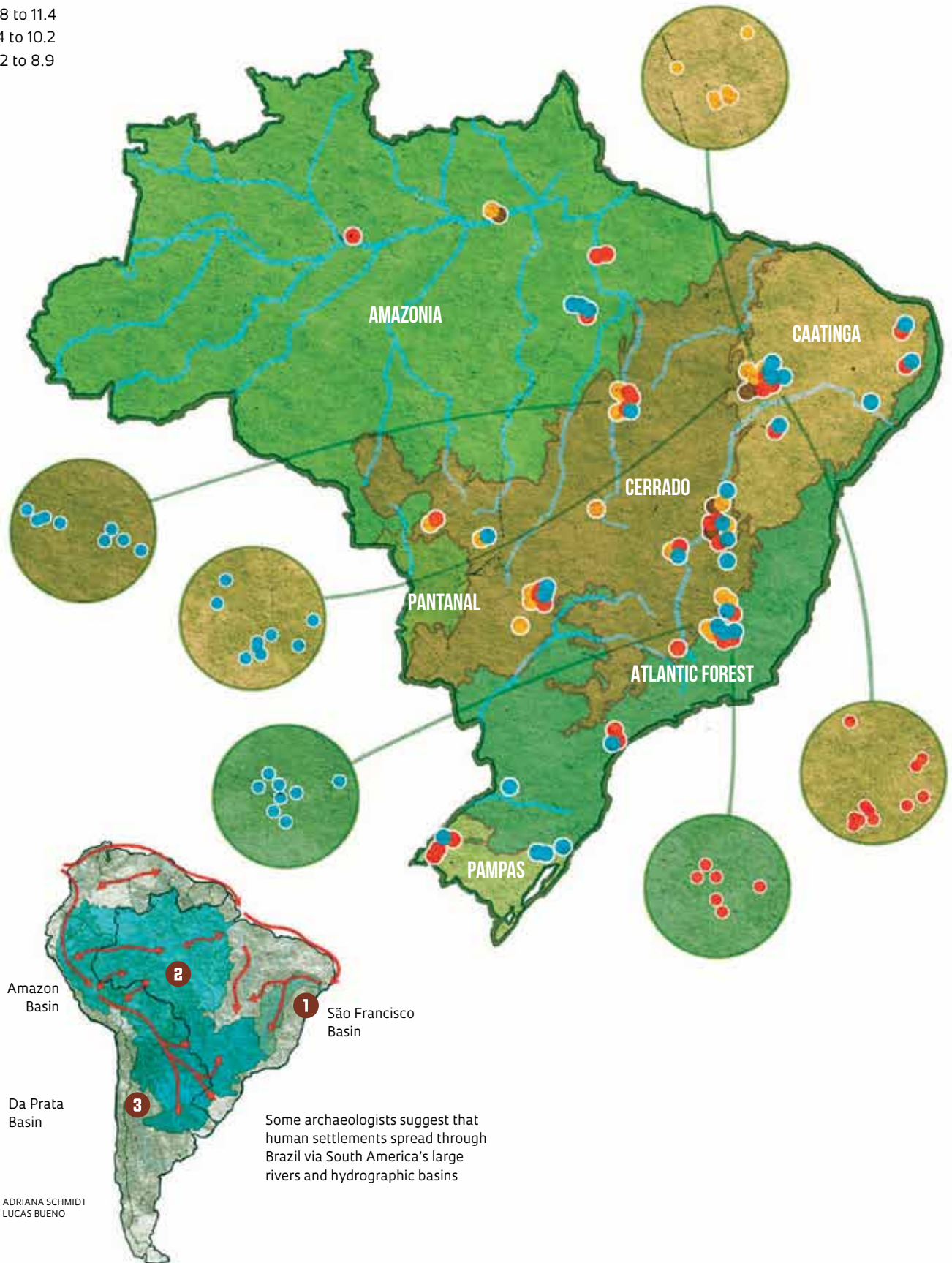


Three arrowheads from the Tunas site in Paraná (*left*), one from Marinheiro in Minas Gerais (*top*), and another from Garivaldino in Rio Grande do Sul (*above*). All are around 10,000 years old

# Age and location of ancient prehistoric sites

When humans occupied the major biomes (dates in thousands of years before the present)

- 15.5 to 12.8
- 12.8 to 11.4
- 11.4 to 10.2
- 10.2 to 8.9





Rock paintings at Pedra Pintada in Monte Alegre, Pará, where human presence dates back 12,000 years

northeast and midwest. Despite its simplified and schematic nature, this overview of the initial colonization of Brazil condenses information and interpretations from most of the archaeological findings of the last three decades.

The picture suggests that modern humans arrived at the furthest reaches of Brazilian territory as part of a complex process, perhaps via multiple routes. To occupy an area the size of Brazil and to develop three distinct material cultures takes time, probably thousands of years. “There may have been multiple migrations into the region, starting before the latest ice age [which peaked about 20,000 years ago],” says archaeologist Astolfo Araujo from the Museum of Archaeology and Ethnology at the University of São Paulo (MAE-USP), who published a scientific paper on the subject in the journal *Anais da Academia Brasileira de Ciências (Annals of the Brazilian academy of sciences)* in April 2015.

A few decades ago, archaeologists were extremely skeptical about the dating of Clovis sites at 13,000 years old or more. The Clovis people were named after the town in New Mexico, USA, where the hunter-gatherer group’s famous fluted projectile points were first found. For most of the last century, the Clovis people were considered

to be the first inhabitants of the Americas, but today, the 13,000-year barrier has been met or surpassed by several other archaeological sites around the continent, both above and below the equator, including Monte Verde in Chile; Huaca Prieta in Peru; the Paisley Caves in Oregon, USA; Triquet Island in British Columbia, Canada; and a number of sites in Brazil. “It is not a question of focusing solely on when Brazil was first inhabited by man, but how people came to inhabit such an enormous area, with such a vast range of landscapes,” says archaeologist Adriana Schmidt Dias from the Federal University of Rio Grande do Sul (UFRGS).

#### BY RIVER

If *Homo sapiens* migrated across the American continent from the Northern Hemisphere to the Southern Hemisphere, they must have passed through and probably settled somewhere in Central America before reaching the Amazon and the Andes. “The problem is that we have not yet found any archaeological sites in Panama—which must have been a part of this journey—that are older than those in South America,” says archaeologist Eduardo Góes Neves from MAE-USP. Upon arriving in South America, humans prob-

ably followed the rivers deep into Brazilian territory. This hypothesis is corroborated by the large number of archaeological sites located near the large rivers that cross the country, such as the Amazon and the Solimões in the Amazon rainforest, the São Francisco in the northeast, and the Paraná and the Uruguay in the south. “Rivers are always the first place to look when contemplating colonization routes,” says archaeologist and anthropologist Walter Neves from the USP Biosciences Institute.

One of the oldest prehistoric sites in Brazil, with a first occupation dated at roughly 25,000 years and another between 12,000 and 2,000 years ago, is the Santa Elina rock shelter in Mato Grosso, located 30 kilometers from the Cuiabá River, an important tributary of the Paraná/Paraguay basin. The Serra da Capivara sites in Piauí, where humans may have arrived some 20,000 years ago, are approximately 100 kilometers from the São Francisco River. Stone tools dated at approximately 12,000 years old were found at Laranjito, a site located on the Brazilian side of the Uruguay River in the far west of the state of Rio Grande do Sul, on the border with Argentina.

In an article published in USP’s *Revista de Estudos Avançados* (*Journal of advanced studies*) in early 2015, Adriana Schmidt Dias and archaeologist Lucas Bueno from the Federal University of Santa Catarina (UFSC) highlighted the existence of three major river routes that may have been used by prehistoric peoples entering the region that is now Brazil: one via the Amazon basin, another by the São Francisco River, and a third through the Da Prata River basin. The paper is largely based on compiled data and interpretations presented in an earlier study, published in *Quaternary International* in 2013 by the same authors, together with English archaeologist James Steele from University College London (UCL).

In this review article, the three researchers analyzed the dates assigned to archaeological artifacts from 90 prehistoric sites in Brazil based on scientific articles published since the mid-1980s. The dates were obtained using carbon-14 dating and a varied set of archaeological remains, such as human bones, teeth, and hair; stone artifacts; spearheads; and many fires (apparently man-

## The Atlantic Forest near the coast may have been the last area of Brazil to be colonized by man

made). The article interpreted 277 dates as reliable, with ages between 15,500 and 8,900 years (*see map on page 65*). “We disregarded 63 dates whose timelines were uncertain, for one reason or another,” explains Dias. Sites dated as more than 15,000 years old, which are often subject to doubts and controversy—as is the case with some sites in the Serra da Capivara National Park and Santa Elina—were also excluded.

Among the dates analyzed in the study, nine were between 15,500 and 12,800 years old. These were the oldest dates in the sample based on materials obtained from five sites. Two of the sites, Toca do Sítio do Meio and Toca do Gordo do Garrincho, are in the Serra da Capivara National Park. Another two are located in the north of Minas Gerais: Lapa do Boquete, in the valley of the Peruaçu River, where the Cerrado and Caatinga biomes intersect, and Lapa do Dragão, on the border with the state of Bahia. The fifth site is Pedra Pintada cave in the north of Pará State, near the Amazon River.



A 10,000-year-old burial site in the Lagoa Santa mining region

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The cave made international headlines in the early 1990s when American archaeologist Anna Roosevelt, the great-granddaughter of former US president Theodore Roosevelt, dated its rock paintings at approximately 11,000 years. The material she collected was not kept in Brazil, but now the cave is being studied again by archaeologist Claide Moraes from the Federal University of Western Pará (UFOPA). “We studied the charcoal and carbonized seeds from fires likely made by humans, and dated them at about 12,000 years,” says Moraes.

After the five oldest sites in the sample, the *Quaternary International* paper examines locations dated between 12,800 and 11,400 years old. It was during this prehistoric period that the geographic distribution of mankind began to expand. In addition to Piauí, Amazonia, and the north of Minas Gerais, there are sites from this period in the far south of the country on the border with Uruguay and in the midwest, such as Santa Elina. There are 56 dates assigned to this period from 29 archaeological sites.

The study also counted 65 dates from 46 sites for the 11,400–10,200-year period, spread from north to south across what is now Brazil. “The number of archaeological sites begins to increase in all regions at around 10,500 years of age,” says

Dias. In the Serranópolis region of the state of Goiás, for example, there are more than 40 sites where lithic material associated with the Itaparica culture has been found. These include cave paintings in rocky shelters along the Verde River, a tributary of the Paranaíba River, and range from 10,700 to 8,400 years old. Even the state of São Paulo, long considered to be an archaeological void, has two sites from this period: Batatal I and Capelinha, both situated in the Ribeira Valley, were used by prehistoric inhabitants as kinds of rubbish heaps on the river banks, known as middens. A 10,000-year-old human skeleton, nicknamed Luzio, was found in Capelinha in the mid-2000s. The site is considered the oldest evidence of human activity in the Atlantic Forest region. Finding archaeological sites in areas near or on the coast is always a challenge—the sea level has varied over time and it is possible that old settlements are now underwater.

#### ARROWHEADS

The arrowheads found in Brazil tell a similar story about early settlement in the region, where this kind of material vestige of prehistoric culture is considered relatively rare. These lithic artifacts, more than 10,000 years old, have been recovered from at least three archaeological sites associated with two distinct ancient cultures. Umbu

Paintings from the Serra da Capivara National Park, one of the oldest sites of human occupation in Brazil





Stone artifact from the Santa Elina site in Mato Grosso State, dated at more than 25,000 years

## Several sites in South America are as old or older than the Clovis culture, which arose in the USA approximately 13,000 years ago

projectile points, aged 10,000 years, were found at the Garivaldino site in the state of Rio Grande do Sul, as well as in Tunas, Paraná. Similar lithic artifacts were also discovered in the Marinheiro cave in Minas Gerais, but the culture to which they belong is still under debate. Some archaeologists believe they are Umbu relics, while others are unsure how they should be classified. “The projectile points from the Marinheiro cave are totally different from those found further south. They do not belong to the Lagoa Santa or Umbu cultures. And they are certainly not of Itaparica origin, a culture that did not even make arrowheads,” says archaeologist Mercedes Okumura from the National Museum at the Federal University of Rio de Janeiro (MN-UFRJ), one of the few researchers in the country studying this type of lithic artifact. “Such variability and diversity in the way projectiles were made would have required a number of factors, including time to develop. To put it simply, it is a similar process to biological evolution.”

It is possible that a prehistoric group that already knew how to make a certain type of arrowhead migrated to an area where there was no such knowledge. In theory, this kind of migration would shorten the time it took for a group to learn how to make points of a certain style. However, the arrowheads found in Brazil do not resemble those of the Clovis culture in North America or the fishtail style found in Argentina and Uruguay, which could be as old as 11,000 years. “There are some of these in Brazil, but they haven’t yet been dated,” says Okumura.

### CALIBRATED AGE

The dating of archaeological sites often results in disagreement, sometimes even controversy, when results suggest unexpected ages. Very few well-preserved human skeletons have been found in the Americas, and of those that have resisted the passage of time, archaeologists have rarely managed to extract any biological tissue (collagen) that can be directly used in carbon-14 dating. Accurately dating human material is always a challenge. With the carbon-14 method, scientists can date material up to 50,000 years old. When it is not possible to establish an occupational timeline for an area using biological tissue from human skeletons, the next step is to look for indirect data. When there are no *Homo sapiens* bones, archaeologists look for

man-made objects or the remains of man-made fires. If none can be found, they must date the geological layer in which the object associated with the human presence was found.

To further complicate matters, the ages provided by carbon-14 dating can be presented in two ways: calibrated or uncalibrated. These different presentations create discrepancies and confusion. The general public does not usually know whether archaeologists or the media are using one method or the other. Carbon-14 ages have to undergo a kind of correction to obtain a true equivalent in calendar years. A carbon-14 age of 10,000 years, after calibration, represents approximately 12,000 calendar years. There is more than one way to perform this correction, and depending on the technique employed and the margin of error, the calibrated results can vary significantly. As a result, some archaeologists prefer to use carbon-14 dating without calibration. “I prefer to use uncalibrated dates,” says Walter Neves. The dates used in this report are the calibrated values. ■

### Scientific articles

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