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THE RISE AND DECLINE OF NORTH AMERICAN
PREHISTORIC SETTLEMENTS
A SEARCH FOR THE MEANING OF HABITAT PATTERNS
AND STRUCTURES IN THE SOUTHEAST

IZVORNI ZNANSTVENI ČLANAK
UDC 711.423:903.3 (73)

USPON I PAD SJEVERNOAMERICKIH
PRAPOVIJESNIH NASEOBINA
OBlici NASELJA I STRUKTURA AMERICKOG
JUGOISTOKA

ORIGINAL SCIENTIFIC PAPER
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FIG. 1 CAHOKIA, ILLINOIS – THE LARGEST PREHISTORIC CITY IN NORTH AMERICA
SL. 1. CAHOKIA, ILLINOIS – NAJVEĆI PRAPOVIJESNI GRAD U SJEVERNOJ AMERICI

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A SEARCH FOR THE MEANING OF HABITAT PATTERNS AND STRUCTURES IN THE SOUTHEAST

USPON I PAD SJEVERNOAMERIČKIH PRAPOVIJESNIH NASEOBINA

OBlici NASELJA I STRUKTURA AMERIČKOG JUGOISTOKA

AMERICAN PREHISTORY
AMERICAN SOUTHEAST
MOUNDBUILDERS
MOUNDS
NATIVE AMERICANS

AMERIČKA PRAPOVIJEST
AMERIČKI JUGOISTOK
GRADITELJI ZEMLJANIH HUMAKA
ZEMLJANI HUMCI
STAROSJEDITELJI AMERIKE

This paper represents analysis of an iceberg of scientific research on the earliest American prehistoric settlements of the Southeast, scoped through the planner's point of view, rather than archeological or anthropological one. Numerous types and sizes of settlements were discovered searching and evaluating existing archeological and anthropological data which were compared with the author's personal observation and experience while visiting some of the existing locations. Despite the fact that these cultures had no written or mathematical skills, the research shows the astonishingly high level in planning and design of settlements and earth structures, which in most cases was related to observation of astronomical phenomena.

Ovaj je članak dio rezultata istraživanja provedenih na temu nastanka prapovijesnog američkog grada, a koja je dosad ponajprije bila tema arheoloških i antropoloških istraživanja. Pomnom obradom i vrjednovanjem dostupnih podataka i obilaskom samo dijela od još uvijek postojećih prapovijesnih lokacija jugoistočnoga dijela SAD-a utvrđeni su brojni oblici i veličine prapovijesnih naselja i pratećih struktura kojih se vrijeme nastanka proteže sve do nekoliko tisuća godina prije nove ere. Rezultati ovoga istraživanja pokazali su, unatoč nepostojanju pisma, visok stupanj promišljanja i planiranja prapovijesnih naselja i ostalih struktura, koje se u najvećem broju slučajeva zasnivalo na astronomskim promatranjima.

INTRODUCTION – THE ARRIVAL IN THE NEW WORLD

UVOD – DOLAZAK U NOVI SVIJET

If questioned about the first North American settlements/cities, most architects and planners would offer the city-history timeline starting several decades after the day of October 12th, 1492, considered the first day of contact: the day that Native Americans first saw Europeans set foot on their land. It was Christopher Columbus and his crew, aboard three ships that had departed the port of Palos de la Frontera in Spain on August 3rd of that year. They landed on one of numerous small islands in the Bahamas. Upon arrival, Columbus named the island *San Salvador* (called Guanahani by its natives) and proclaimed it a property of the Spanish Crown. He was convinced that he and his sailors had managed to reach the target of their voyage – the east coast of Asia – and he remained convinced of this even on his deathbed in 1506. After Columbus returned to Spain, the collected artifacts made by the people he had met and traded with revealed the unavoidable truth: sailing west they had not reached India. None of the items seemed to fit existing knowledge of similar imported items originating in India. Besides, the on-site sketches of aboriginals didn't match already known profile and physical description of India inhabitants. Neither the people nor the places had anything to do with India – they were totally unknown to the Europeans. The sketches of settlements found there proved that they had existed centuries before the contact in 1492.

Numerous overseas expeditions, much deeper and wider into the new-found territory, were undertaken at the beginning of the 16th century. The first expedition into the heart of the newly discovered mainland was led by Hernando de Soto,¹ who became the first European to reach the banks of the Mississippi River. There he encountered something Europe had never dreamt of: abundant and fenced settlements with numerous flat-topped earth mounds (Fig. 1) and sizable, though long since abandoned, farmland. Through stories told by the aboriginals De Soto's group met traveling through the woodlands, they learned that mound places were built and inhabited by people called Moundbuilders. Whatever the stories (true or false) told, there was one inescapable truth: this land had been occupied by settlements erected by unknown cultures, much older than had ever been imagined. Who were these people? Where did they come from? For how long had they populated this new land? Scholars of the Old World were stunned. They had to find the answers.²

The first humans reached America (Alaska) from Siberia some 12,000-15,000 years ago, crossing the newly created "ice-free corridor" between Asia and North America – the Bering Strait, a vast dry land created during the Late Pleistocene Period. This Ice Age caused a worldwide lowering of the sea level by some 70 meters, which exposed nearly 1,600-kilometer-wide land bridge between Asia and North America and allowed on-foot access to the new land. Around 10,000-12,000 BC, the climate changed and ice-caps melted, unleashing megatons of water and creating an impassable barrier for small bands of big-game hunters chasing their prey across the treeless plains between two soon-to-be-divided continents. There was no return, so

¹ A Spanish explorer and *conquistador* in 1539/40 who led three expeditions into the mainland, southeast of today's North American continent, in search of gold and land passage to China.

² Today it is presumed (FOLSOM AND FOLSOM: 1994: 48) that, at the moment Christopher Columbus reached the Bahamas, both American continents were populated by some 55-66 billion *Native Americans*. Although no writings have been found, the discovered settlement patterns elaborated very sophisticated settlement "planning".

³ Gordon R. Willey (1913-2002), professor at the Department of Anthropology, Harvard University, described prehistoric stages of North American Cultures in his outstanding book *Method and Theory in American Archaeology* (1958), which remain the accepted scientific division of American prehistory.

⁴ The term *Paleo-Indian* came into use by scholars in the mid-twentieth century, intended to identify the culture that could be described as *first Americans*.

⁵ The archeologist William A. Ritchie (1932) was the first to introduce the term "Archaic" into American archeological literature to describe certain findings, primarily chipped stone tools. Today, this term describes a time-and-culture period, differentiating it from the earlier *Pa-*

they had to continue their journey across the open land of today's Yukon River Valley in Alaska (between the Brooks and Alaska Ranges) towards the south, passing by the Rocky Mountains. During this time-and-place *Continuum*, the bands of new-comers headed in three directions: following mega fauna along the mountains one reached the Pacific coast, the others headed south towards the dry areas of today's New Mexico and Arizona, while the rest ended in the wet woodlands of the Southeast (Fig. 2).

To better understand this paper, it is necessary to define the time-span of North American cultural stages. According to Gordon R. Willey,³ an outstanding American archeologist, there are five major prehistoric stages of North American cultures:

1. LITHIC (*Paleo-Indian*⁴) stage embracing the period of some 9,000 years (between 13,000 and 4000 BC) which can be roughly observed through two sub-stages: *Llano* and *Plano*;
2. ARCHAIC⁵ period covering a time-span of 3,000 years (between 4000 and 1000 BC), characterized by small-game hunters gathered into larger groups in seasonal camps;
3. FORMATIVE stage covering the period of 2,000 years, until the end of the first millennium of the Common Era (CE), with evidence of the first sedentary (and religious) lifestyle within simple village patterns;
4. CLASSIC stage, one of the shortest – roughly 300 years (between 1000-1300 CE), which is characterized by political, religious, military and even scientific activities (building of religious structures and observatories);
5. POST CLASSIC (1200-1540 CE) is the final stage of American prehistory, which concludes with the first contact.

Little is left of the people from the early Lithic (*Llano*, 13,000 – 8500 BC). The first evidence

leo-Indian period, based on stylistic differences of stone-point types and other artifacts appearance.

6 During summer camp in 1926, a group of archeologists from the *Denver Museum of Natural History* discovered several stone tools among the numerous bones of an extinct species of bison – bifacial chipped spear points with flute-like channel on both sides.

7 The most recognizable item is the fluted spear-point, flaked on both edges, with a small groove (or flute) removed from the base of each side used to nest a spear-point on a stick. The great mobility of the *Paleo-Indians* is suggested by the findings of stone tools throughout the Southeast and West. The spears were transported and traded over hundreds of kilometers from the quarry source, proving that the *Clovis* people explored and colonized the region.

8 The *Poverty Point* sites in Louisiana and western Mississippi represent the first major residential settlements and monumental earthworks in the United States. Although the social organization of the *Poverty Point* culture is not fully understood, it is recognized as the first culture extensively involved in transportation and trade of non-local raw materials which were made into finished products for further trade (like shells, rare rocks, copper), covering the eastern United States, from the Gulf of Mexico to the Great Lakes.

of these ancient Americans was discovered near the town of Folsom,⁶ New Mexico, in 1926. But in 1930, a new discovery at a site near the city of Clovis, NM, shook the world. Executing deeper strata excavations than at the Folsom site, archeologists found much different findings containing larger bones and stone artifacts. Among the ribs of a woolly mammoth they found numerous stone fluted spear points. As that kind of mammoth roamed the environment before the end of the Pleistocene Era, the site produced proof of a man that populated the area much before the *Folsom* people. These ancestors of all the indigenous cultures of North and South America were called *Clovis* people, after the City of Clovis. This site provided the first scholarly convincing proof of prehistoric human existence within the New World. Soon numerous sites from the same period were discovered, providing the world with more stone artifacts⁷ at kill-sites located at or near water sources, at the bottom of cliffs (the jump-kill), and at dead-end canyons.

By the end of the Archaic Period (ca 1000 BC), Paleo-Indians had shifted from intensive and broad-range foraging to the beginning of real cultivation of plants needed for their diet – changing their lifestyle from hunter/gatherer to a more settled existence. The Late Archaic people of the Southeast developed the first sedentary settlements and cultivated saltwater oyster beds, while the *Poverty Point* culture in the lower Mississippi River Valley developed permanent settlements on the riverbank cliffs, with several satellite communities. Many exotic (from outside the region) goods have been found inside the burial sites, which proves there was exchange/trade between different cultures. The Late Archaic Period is also characterized by fiber-tempered plain and decorated ceramics, which spread from the South Atlantic coast to the coastal plain of Alabama and Mississippi (*Poverty Point culture* area).⁸ The appearance of pottery has been viewed as a proof of the transitional period between *Archaic* hunting band camps and settled *Woodland* villages, when human existence depended on hunting, farming-gathering and storing the surplus. Finally, this period is considered the beginning of the southeastern mound-building tradition that would later evolve into the succeeding *Woodland* and *Mississippian* Periods.

BEGINNING OF HABITATION

POČETAK NASELJAVANJA

Due to climatic change by the end of the Pleistocene Period (around 8000 BC), and to humans' success in roaming the vast land and hunting, the mega fauna faced extinction. The Paleo-Indians had to revert to hunt-



FIG. 2 PALEOINDIAN MIGRATIONS OVER THE BERING STRAIT LAND BRIDGE TOWARDS SOUTH (8000-6000 BC)

SL. 2. SMJEROVI MIGRACIJA PREKO BERINGOVOG PROLAZA I DALJE NA JUG (8000.-6000. PR. N. E.)

ing smaller animals such as deer, bison, ... (*Clovis* vs. *Folsom* people); they were forced to change the size of their spear points and take up farming. No permanent settlements existed at that time yet, as hunting demanded mobility.

Social connections consisted of loose family groups based on kinship with no more than 50 members. The band would repeatedly move from one campsite to another (to new ones or back to old ones) during a single year. They would occasionally meet on specific sites to exchange goods or tools, or for ceremonial reasons.⁹ The only settlement-structures from that period were shallow pits covered with branches, bark and animal skin.

None of the prehistoric North American cultures had any knowledge of writing, so there are no written documents¹⁰ of their life and social system. The only data we have are assumptions based on archeological and anthropological researches performed at the various excavation sites.

In order to better understand the Paleo cultures, we should review the mayor topographic features of the two American continents. The most striking are the great Cordilleras that extend along both continents: from Alaska, down the Rocky Mountains, and continuing with the Andean mountain chain that stretches along the western coastline of South America. This mountain chain is also known as the Backbone of the Americas.

The North American continent's geography varies from desert valleys (some of them even below sea level) to some of the world's highest peaks. The land east of the Cordilleras is mostly a large plain, with the exception of the Appalachian Mountains.

The river plains and vast woodland areas of the east represent the most fruitful part of the continent – the Mississippi River Valley. Another natural element that played an important role in spread of population was the tolerance of major food plants to frost. As most of the plants originated from the tropics (maize, corn, beans, squashes), their growing was most successful in lower latitudes. This provides a partial answer to the question of why the most human presence and settlement is found by rivers and within the moderate temperature regions along the Mississippi River. These cultures erected settlements, structured with mounds and other earthworks which differed in shape, size and building purpose.

In this paper we shall concentrate on the culture that occupied the southeast of the United States and their way of planning and constructing places of long-term habitation.

THE BEGINNING OF SETTLEMENT CREATION

POČETAK STVARANJA NASELJA

For the purpose of this research, the last three stages mentioned previously will be differentiated through another time division, the division which relates more to the topic of this paper – human settlements of the Southeast. The *late* Archaic Period is followed by the so-called *Woodland Period*¹¹ which is, among scholars, divided into three sub-periods: *Adena*¹² or *Early Woodland* (1150-200/100 BC); *Hopewell*¹³ or *Middle Woodland* (200/100 BC – 500 CE); and *Late Woodland* (500-1200 CE). Partly overlapping the *Woodland Period* is the so-called *Mississippian Period*¹⁴ which covers the span between 900 and 1500 CE. *Fort Ancient*¹⁵ or *Late Prehistoric* (1000-1500/1550 CE) was the last stage of prehistoric cultures that populated the North American continent. All of these time spans should be taken loosely, as the time range of each of them differs depending on the region within the continent.

The adoption of a basic agriculture made it possible for *Woodland* people to start living

9 *** 1992: 23-24

10 The exceptions are numerous petroglyphs, petroglyphs and pictograms found throughout the Southwest that represent randomly drawn human, animal or plant images (drawings), along with numerous geometric shapes of which the most common is a spiral. Some are recognized as representing astronomical features and occurrences – such as the petroglyphs of the *Super Nova* and Halley's Comet found in Chaco Canyon, NHP in New Mexico. The star that caused the 1054 *Super Nova* was six times brighter than Venus and was visible at high noon for 23 days.

11 The term "*Woodland*" was introduced in the 1930s to describe prehistoric sites and cultures placed in time between the *Archaic* (hunting and gathering) and the *Mississippian* (mound-building) cultures of the Southeast, roughly from 1000 BC to 1100 CE. It is characterized by developments in pottery, introduction of the bow and arrow, construction of conical burial mounds, long-distance trade, and agriculture. During this stage there was a marked increase in ceremonialism – perhaps as a result of people settling longer in one place.

12 The *Adena* culture derives its name from a mansion owned by Governor Thomas Worthington in Chillicothe, Ohio (around 1800), where the first artifacts from this period were found.

13 The *Hopewell* culture derives its name from the owner of a farm in Ohio which was extensively excavated and searched by many archeologists in the 19th century. The excavations uncovered traces of a culture younger and more sophisticated than the *Adena*.

14 The term *Mississippian* refers to the culture that flourished along the lower Mississippi River region, where most of the significant rectangular mounds and earthworks were built around central plazas and used for religious rituals and elite residences.

15 Fort Ancient was named after the high-walled and fort-like structures found near the Little Miami River in southern Ohio. The name was given by the locals. The sites were not fortresses, but ceremonial centers primarily built by the *Hopewellians* and then built up and rebuilt by the Fort Ancients, some 400 years after the *Hopewellians* left it. The Fort Ancient culture flourished within the Ohio River Valley (southern modern-day Ohio, northern Ken-

in one place for most of the year, without facing a food shortage. By clearing the wetland near riverbanks, they created grass fields for deer and other small game to graze. The *Adena* people were the first to live in permanent settlements, with up to a dozen buildings that could house the family and close relatives within circular houses, constructed by paired posts tilted outward and joined to form a cone-shaped roof covered with bark. The most we have learned about the *Adena* people has come from the conical mounds (built out of earth brought to the site in hundreds of thousands of baskets) ranging in size from 6 to 90 meters in diameter and up to 12 meters in height. Most of the mounds served as burial sites for their dead¹⁶ (Fig. 3). In most cases, the *Adena* burial mounds¹⁷ were located on remote out-of-village spots, along bluffs overlooking streams or rivers.

Some hundred years prior to the turn of the new era, new people with a distinct culture began to emerge in the northern woodlands, and continued to live with the *Adena* culture structures and settlements. They were named *Hopewell*. While they had much in common

tucky and western West Virginia). This culture was once thought of as an expansion of the *Mississippian* culture, but now is well recognized as an independently developed culture after *Hopewell*, which are also known as *Mound-builders*

16 The dead were laid on the hill summit, to be closer to the sky; then earth or gravel was piled upon the bodies. The bodies were stacked in layers; thus the biggest burial mounds might contain bodies of several generations. Their belongings were buried along with the bodies, which today provide evidence of the quality of their crafts, as well as their social leadership and organization.

17 One of the *Adena* burial mounds in West Virginia caused a major turnaround within the science of archeology. Thomas Jefferson, an amateur archeologist and researcher, soon to become the third US president, made some excavations over the earth mound found at his family plantation *Monticello* near Charlottesville. Unlike other archeologists of that time, he started the excavations by removing the entire grass cover and digging a vertical cross-mound trench from the top to the bottom, writing notes and sketching every artifact he found along with its surrounding environment. This provided the knowledge of entire mound-layers through the entire time-span and connecting the found artifact with the earth-layer around it. This approach was the beginning of a new methodology in archeological excavations and collecting data – *stratification*. Jefferson presented his results and conclusions, along with a detailed description of his research, in an article, *Notes on the State of Virginia*, in 1787. (http://archaeology.suite101.com/article.cfm/thomas_jeffersons_bones).

18 GRIFFIN, 1956: 63-71

19 Besides maize, which required at least 200 days of growing, they now had corn, which required only 120 days with no below-zero temperatures. This allowed planting and farming further north and on higher elevations than before.

20 The bow and arrow was invented in the Southwest and brought to the Southeast through trade, enabling hunters to be more accurate and successful in targeting and killing their game.

21 Some of the best preserved sites and settlements are described at the end of this paper.

with the *Adena* people, there was something that differentiated them – they had canoes which they paddled to the north (Lakes Erie and Ontario) and south (along the Ohio and Mississippi Rivers), trading goods from the Gulf of Mexico with goods from the Great Lakes or plains. They were notable for just a few centuries, yet they represent the *Woodland* people at their peak. In addition to their advanced farming techniques, they built more complex structures that clearly demonstrated their knowledge of mathematics and astronomy. Their mounds and earthworks were shaped and aligned to connect the earth with the universe above; they created geometric Figures and understood the cycles of the sun and the moon, along with the movement of other visible stars. *Hopewell* villages were larger than those made by the *Adena*. They housed several hundred inhabitants that lived in larger and oval-shaped houses (bare saplings were set in the ground and bent towards the middle roof beam, forming a rounded roof which was covered with animal skins, elm bark, or simply mats of woven fiber). Within the settlements,¹⁸ which had massive earthworks along the enclosure lines, burial mounds were found. Around 500 CE, for reasons that still remain unclear, the *Hopewell* culture disappeared. One reason could be the change in climate – colder weather rendered foraging and gardening less productive. There was no more surplus of food for trading, and shortage of food might have resulted in more hostile clashes between neighboring villages and the erecting of fences around their enclosures.

The next culture has been named *Mississippian* and was nested within the lower Mississippi Valley. Their diet was enriched by corn,¹⁹ beans and squash imported by trade from Mexico and then planted and grown next to the village: the entire population had enough food and necessary proteins. Still, the *Mississippians* remained hunters who replaced the spear, inherited from their ancestors, with the bow and arrow.²⁰ The mound sites near rivers and trading routes soon evolved into large urban centers with flat-topped mounds.²¹ The central mound was usually a multi-level, truncated pyramid constructed in stages, serving as a base for a temple or other ceremonial or astronomical structure. There were grand plazas, burial mounds (cemeteries), playgrounds, structures with astronomical functions (like *calendar poles* in Cahokia), and palisades enclosing the entire village. Some mound sites can be found in Canada, too but their number, shape and appearance as settlements cannot be compared to the ones in the Southeast of US.

From the planner's point of view, a settlement may be defined as a unit of Space within



FIG. 3 HOPEWELL BURIAL MOUND, CHILLICOTHE, OHIO
SL. 3. POGREBNI HUMAK, CHILLICOTHE, OHIO

Time, with definable limits containing several dwellings or other structures used by humans during a definable period of time. The arrangement of dwellings and other structures, the relation of built to open space, is called the *settlement pattern*, which could be either planned or organic – *vernacular*. One of the very first scholars to focus on settlement typology within an environment was archaeologist Gordon Willey.²² Following Willey's idea, another archeologist, W. Sears,²³ suggested classification of settlement pattern in the Southeast into six different units: *camp, village, town, ceremonial center, village cluster* and *town cluster*. But there is something *vague* about this division, where size and function are not considered separately.

SETTLEMENT TYPES

VRSTE NASELJA

Therefore let us return to our (the planner's) point of view. The most obvious and acceptable way to define settlement type is by its size, and then by its primary function. Described by the category of size, five different types can be distinguished: *camp, hamlet, village, town* and *village/town clusters*. The first type – *camp*, refers to the simplest and smallest site where dwellings for sheltering people can scarcely be found or recognized. The dwellings, in fact very primitive structures covered by branches, animal skin or bark (scarcity or total absence of post holes at most of the sites of this size indicates a very poor existence of permanent structures), were usually organized around a fire pit with very thin sediments around. As the camp occupied a very small area (between 50-400 m²), it could provide shelter for few community members; therefore it must have served mostly for short-term and/or seasonal occupation.

Next in size to the *camp* is a *hamlet*, covering an area between 1,000 and 5,000 m². The hamlet consisted of a maximum of 15 dwelling structures that were similar to today's farmsteads scattered around the site. Shelters were improved by adding walls along the sides.

A *village* comprised a much larger area – between 3,000-12,000 m². The structures were more complex than the ones within a *camp* or *hamlet*. According to post-mold traces (depth, size and alignment), it is evident that the structures were sturdier than those in *camps* or *hamlets* and remained longer in place. Some of the *village* enclosures were even fenced (like those of *Hopewell* origin). In addition to houses, there was at least one ceremonial mound while burial mounds were located outside the *village* enclosure.

A *town* represents the largest single prehistoric inhabited place. The size was between 50-80 hectares, which enabled the erection of several hundred dwellings. The depths of refuse sediments, along with the depth of findings of heavy wooden structures, have proved the settlements' longevity. There are also cases in which dwellings were rebuilt or strengthened right on the spot. They were placed around the open plazas with at least one ceremonial mound. The layout of these groups was seldom in cardinal direction, creating a gridded settlement, with very few mounds built in a different direction (*Moundville*, Alabama). *Towns* were enclosed by loaf-mounds or palisades.

A *village/town cluster* consisted of several neighboring *villages/towns* that were related to each other, either by religious or cultural ceremonies, or by economic exchange of agriculture, game or products of art and everyday life. A similar scenario might have occurred later, a century before the first White Contact (early 16th century), when cultural life was at its peak; at this time, several towns were clustered around a strong nucleus (a ceremonial center with several temple mounds, burial mounds and plazas), such as *Moundville*, or *Cahokia*.

Differentiated by function (or primary use), the following types of settlements can be observed: *habitat settlements, ceremonial/religious centers, trade centers*, or all three at once (like *Cahokia*). However we look upon the prehistoric settlements, there are some major characteristics that indicate that the settlements were carefully planned, and not

²² G. Willey was a pioneer in settlement pattern studies. The approach, based on his fieldwork in Peru's *Viru Valley* during the late 1940s and early 1950s, highlighted the importance of the surrounding landscape, geographic location and its impact on the settlement pattern and represented a new approach in the world of archeology. Prior to this, little attention was paid to "settlement" patterns and the surrounding environment. For Willey, the patterns not only provided examples of human adaptation to the environment, but also mirrored the articulation of socio-political processes within certain time-space distribution.

²³ SEARS, 1956: 45-51

²⁴ *Mound* is a term in archeology that defines a deliberately constructed, elevated earthen structure or earthwork as an artificially heaped pile of earth, gravel, sand, rock or even debris intended to serve a range of potential uses. Besides mounds, there are numerous elevated causeways and paths (like the ones in Florida where the major reason for their construction might had been in vast swamps and marshland), and earthen enclosures of settlements.

²⁵ A *conical mound* is a mound with a circular or oval base. It is not flattened, but more cone-like. The conical mound was mainly used as a burial mound. But there are also cases of different usages of the conical mound. Excavations performed on the top of mounds outside some settlement enclosures uncovered traces of fire, which suggest the mounds might have served as a lighthouse to aid in after-dark movement, or possibly as some kind of communication medium (distant signaling with fire smoke?).

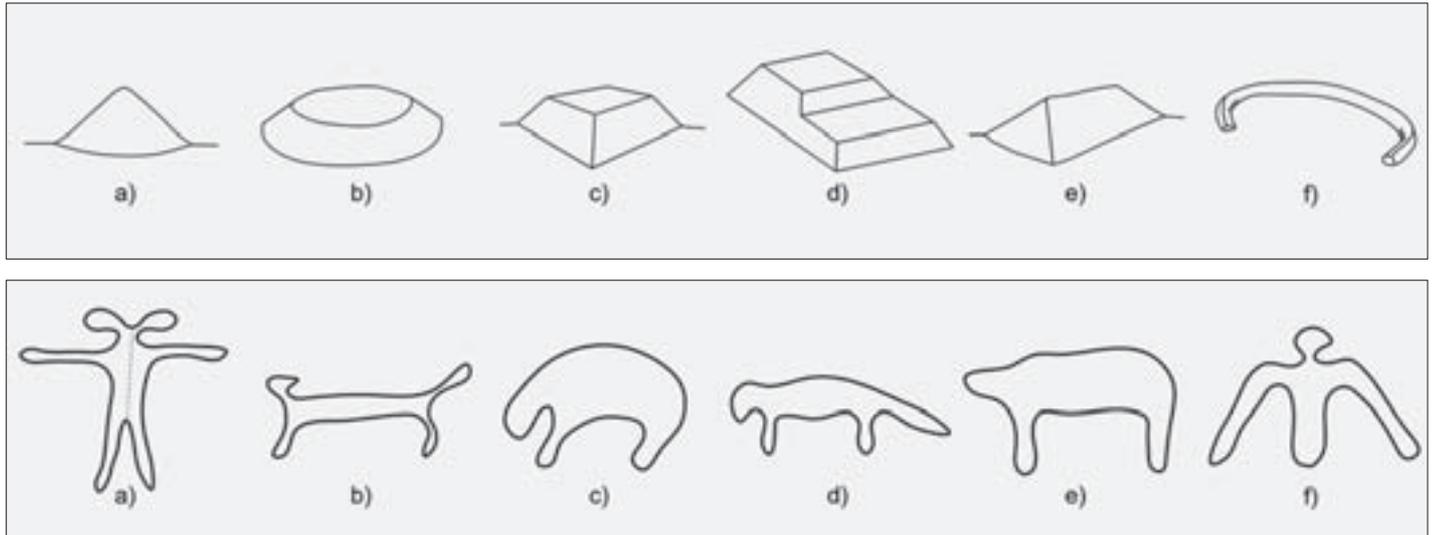


FIG. 4 MAJOR MOUND TYPES
SL. 4. OSNOVNI OBLICI ZEMLJANIH HUMAKA

FIG. 5 MAJOR EFFIGY TYPES
SL. 5. OSNOVNI OBLICI /EFFIGY/ ZEMLJANIH HUMAKA

haphazardly or randomly constructed: proximity to water (either for drinking, fishing, or transportation of goods); elevation from the surrounding terrain to avoid flooding; and orientation dependent on the dominant surrounding topographic features. Most of the structures were aligned with cardinal directions, and a few were aligned with certain astronomical features and occurrences.

The most outstanding astronomical alignments are connected with the sun's position at summer/winter solstice, or spring/autumn equinox (Poverty point, Cahokia), although alignment with the northernmost position of the moon's rising and setting can also be observed at some sites (Serpent mound).

26 A *platform mound* is a truncated earth structure with a rectangular base meant to support a structure (temple, house of the chief, "council house" or astronomic structure) or activity (cultural, religious or public gathering). Mississippian platform mounds are usually four-sided truncated pyramids, steeply sided, with steps of wooden logs set along one pyramid-sloping side. If the slope was too steep then they built an additional projecting ascending ramp in order to reduce the slope for platform access.

27 A ridge or loaf mound has form of a long, sinuous, parallel-sided mound, approximately uniform in height and width along its length, and usually was flanked by ditches on either side. Some of the ridge mounds found in Cahokia had wooden poles lined up along the ridge, mostly oriented with respect to the major cardinal axes. The mound height may have varied between 0.5-2.00 meters. The ridge mounds could have served to create site enclosures (Hopewell sites) or the entire settlement (semi-octagonal ridges at Poverty point).

28 The most famous and the most explored effigy is the one in southern Ohio – the *Great Serpent* or *Great Serpent Mound* dating from the *Hopewell* period. The effigy is discussed below.

29 Very well-documented data about increases in El Niño/Southern Oscillation events allow us to conclude that the rainfall at that time was extremely erratic and unpredictable. Therefore, the mounds and all earthworks with causeways might have been a community response to droughts and flooding – elevating and protecting the habitat and communication lines from the flood danger areas.

The only structures within once existing settlements that can be observed today are the *mounds* and *earthworks*,²⁴ which differ in shape, use and size. The most common mound shapes are: *conical*²⁵ mounds (a), *flat-topped* or *platform*²⁶ mounds (b, c, d), and *ridge*²⁷ (e, f) or *loaf* mounds (Fig. 4). In order to convey an idea or a symbol connected with religious or astronomical features, some of the earthworks erected by the *Adena* people had forms and shapes of different animals (also known as *effigies*) such as bears, foxes, birds or snakes²⁸ or even humans (Fig. 5). The purposes of the building mounds and earthworks are still unclear, but some recent studies on paleo-climatic changes²⁹ may provide clues.

Settlements in the Mississippi and Ohio River Valleys had enclosures of notable size and geometric shape that differed from single to multiple interconnecting geometric forms (circles, squares, rectangles, ...) sometimes over 100 meters in diameter, with a ditch alongside (probably created by digging the earth for the embankment). In later stages (Cahokia) the settlement enclosures were palisades. During the *Hopewell* and *Mississippian* eras, the structures within the enclosure were grouped around plazas of square or rectangular shape (interestingly, the plazas in the *Adena* period were mostly circular). Within larger settlements, there were several plazas – separate or interconnecting, but always laid along a cardinal direction. The use of these open spaces varied in usage: ceremonial or game usage.

Detailed descriptions of seven, most representative, Moundbuilders' sites follow and they will hopefully aid in understanding their importance and lead to a better understanding of American settlement planning history in the future.



FIG. 6 LOUISIANA STATE WITHIN THE US

SL. 6. POLOŽAJ DRŽAVE LOUISIANA UNUTAR SAD-A

FIG. 7 SITE LOCATION WITHIN THE STATE OF LOUISIANA

SL. 7. POLOŽAJ LOKALITETA UNUTAR SAVEZNE DRŽAVE

FIG. 8 WATSON BRAKE LAYOUT PLAN

SL. 8. WATSON BRAKE, MODEL TERENA

FIG. 9 VIEW OF THE LARGEST TODAY EXISTING MOUND

SL. 9. IZGLED OSTATKA DANAŠNJEG NAJVEĆEG HUMKA

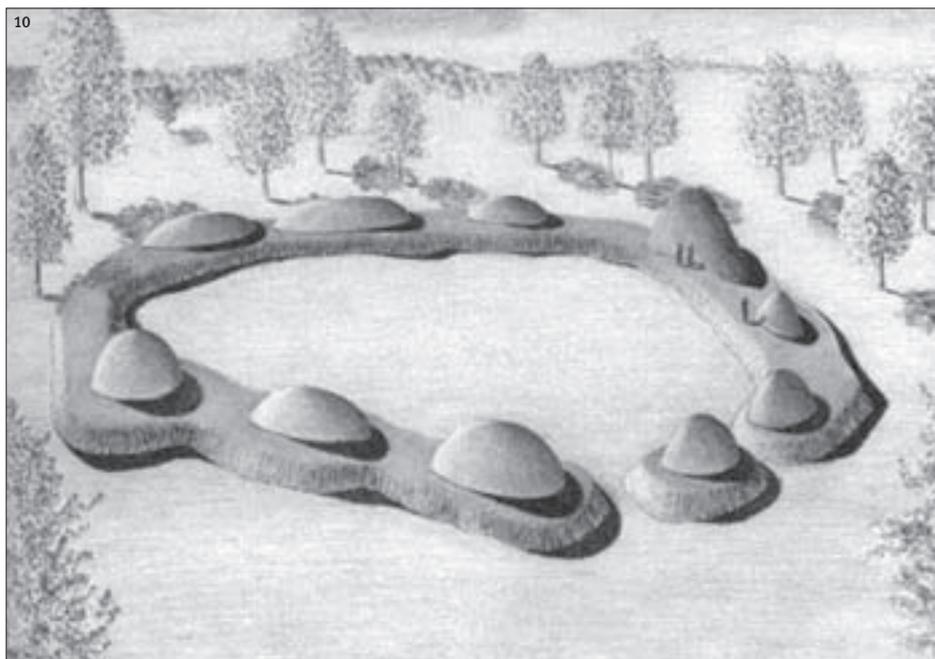
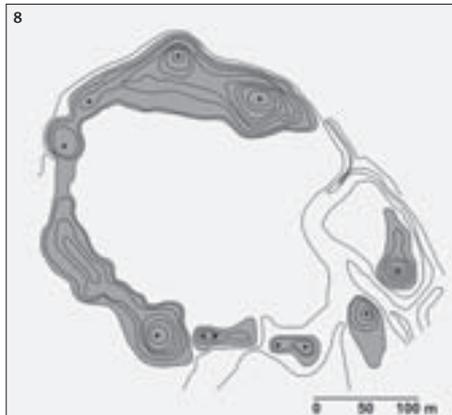
FIG. 10 WATSON BRAKE – POSSIBLE APPEARANCE OF THE SITE

SL. 10. WATSON BRAKE, MOGUĆI IZGLED LOKALITETA



1 SITE NAME:	WATSON BRAKE
SITE LOCATION:	MONROE, LA
SETTLEMENT TYPE:	CAMP
STRUCTURE TYPE:	MOUNDS AND EARTHWORK
PREHISTORIC STAGE:	ARCHAIC

Watson Brake, a prehistoric camp near the town of Monroe in the floodplain of the Quachita River (lower Mississippi River valley), northern Louisiana (Figs. 6, 7), represents an arrangement of 11 human-made conical mounds (Fig. 8) differing in height (1-7 m) and erected upon an oval shaped earth enclosure (ridge) sizing 190 by 250 m creating a large central plaza (Fig. 10). The enlo-



sure itself measured some 1,2 meter in height and 3,5 to five meters in width. The mounds were not used for burial or religious purposes (as no human remains or ceremonial objects have been found, but some faunal and floral remains instead). This site is considered as the earliest mound complex in North America – some 2,000 years before the better-known Poverty point earthworks near Epps. The complex was discovered by a local young archaeologist Recca Bamburg Jones on her property, in 1981. In 1997, Joe Saunders regional archaeologist working for the *Division of Archaeology of Louisiana*, published the findings about Watson Brake as an article in *Science*. In this site survey he presented the strong evidence that the earth structures were human-made by Middle Archaic hunter-gatherers. Because the "plaza" was found clean of debris, he concluded that the site had been used as a ritual space, rather than habitat. The discovery and dating of Watson Brake site undoubtedly demonstrated that the Mid- and Late-Archaic cultures (spread within the territory of the present-day US) were much more complex than previously thought. Very extensive stratigraphic studies, along with radiocarbon dates, displayed the data of first earthworks to be undertaken around 3500 BC. Mound-building process at this site restarted at about 3350 BC and continued in stages for couple of centuries. The site was abandoned for good around 2800 BC, after the Arkansas River changed course, making the site less suitable for seasonal habitation. Today, the site is hardly recognizable, except for the largest mound (Fig. 9).

Poverty Point is the oldest, largest and most complex *Late Archaic* earthwork site in North America, near the town of Epps by Mississippi River, northern Louisiana (Figs. 11, 12). The name has been derived from the plantation where it was discovered in 1873 by archaeologist Samuel Lockett. It was firstly believed to be of a natural phenomenon, but aerial photos (1950) revealed the complexity of the earthwork pattern and helped in recognizing it as a man-made structure. The most important figure in bringing the importance of this site to scholar community is archaeologist Jon Gibson, who performed most of contemporary site excavations. The whole site covers the area of nearly 160 hectares, while the main complex consists of six semi-elliptical platform ridges and five mounds spread around (Fig. 13). The ridges, that originally were 1,2-2,0 m high, now reach less than 50 cm, while the platform width might have reached up to 24 m. The ends of the out-most ridge are 1185 m apart, while the central ones are 590 m apart. They were separated by ditches 43-60 meters wide, (assumed to be created by digging necessary earth for ridge construction). The ridges were divided into six sectors by five wide aisles (passages) 10-49 meters wide. Interestingly, directions of these aisles coincide with some astronomical alignments, but the most obvious are the lines that connect central *Dunbar Mound* with *Mound B* and southeast perimeter of the *Mound A* (known also as a Bird Effigy mound, sizing more than 21 m high and nearly 200 m in wing span) defining the direction of Summer and Winter sunset (Fig. 14). According to the findings of wooden poles within the ridges, it is

2 SITE NAME:	POVERTY POINT
SITE LOCATION:	EPPS, LA
SETTLEMENT TYPE:	TOWN / CEREMONIAL / TRADE CENTER
STRUCTURE TYPE:	MOUNDS AND EARTHWORK
PREHISTORIC STAGE:	POVERTY POINT

assumed the platforms were used for nesting first buildings or shelters, while some larger poles might have been used as calendar markers (archeologists W. Haag excavated some pits with huge, tree-size posts that were too large for house construction). Central plaza, sizing nearly 15 hectares, is assumed to serve for ceremonial meetings and had two smaller mounds (*Dunbar Mound* by the north, and smaller *Sarra's Mound* by the south river rim). Other two mounds (*Lower Jackson Mound* and *Motley Mound*) today are hardly recognizable and approachable as they are on a private property. Usage of the site still remains a mystery – some scholars think that up to 7000 people might have lived there during the peak period, while the others consider the site to be occupied temporarily during (religious or astronomical) ceremonies or trade fairs. Other artifacts made of material that cannot be found in the vicinity, prove the idea of a site to be a center for long-distance trade. The Poverty Point site has been registered as National Historic Landmark (NHL) since 1962 until October 31st 1988 when the site was recognized as a National Monument.

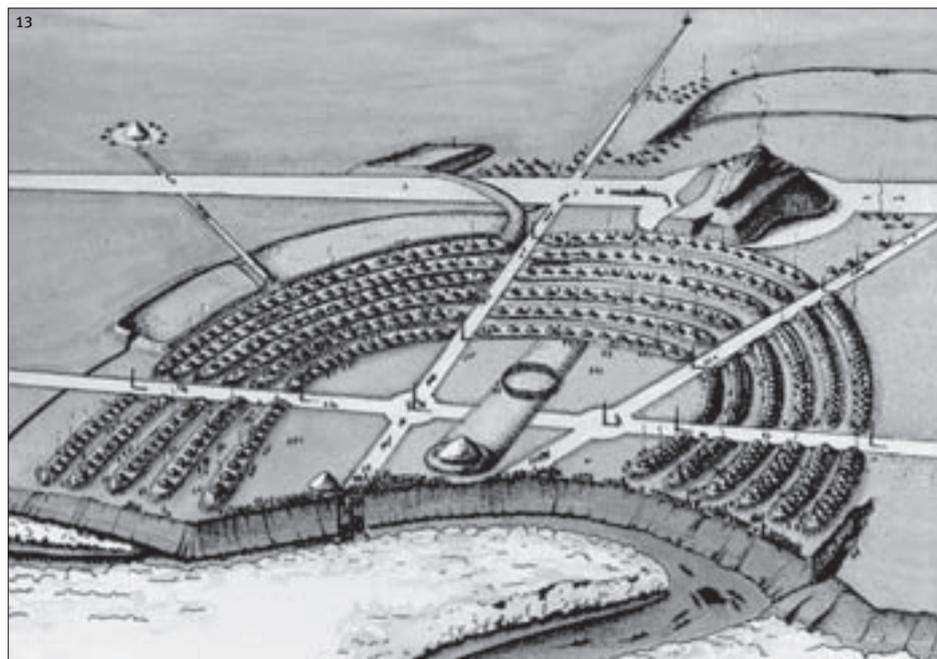
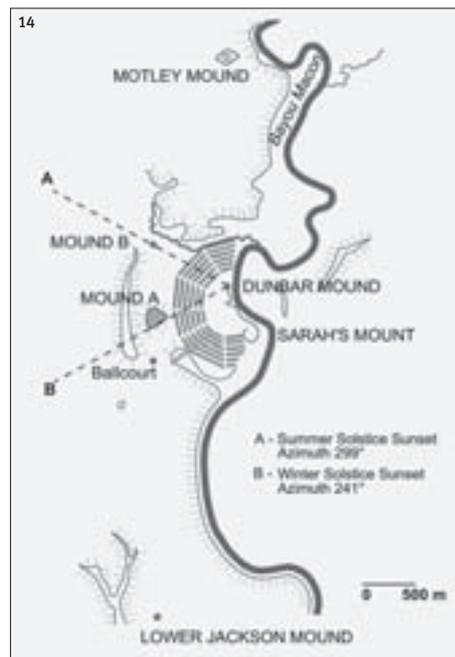


Fig. 11 LOUISIANA STATE WITHIN THE US
SL. 11. POLOZAJ DRŽAVE LOUISIANA UNUTAR SAD-A

Fig. 12 SITE LOCATION WITHIN THE STATE OF LOUISIANA
SL. 12. POLOZAJ LOKALITETA UNUTAR SAVEZNE DRŽAVE

Fig. 13 POVERTY POINT – VIEW FROM THE EAST
SL. 13. POVERTY POINT, MOGUĆI IZGLED LOKALITETA

Fig. 14 POVERTY POINT – MOUND STRUCTURES AND ASTRONOMICAL ALIGNMENTS
SL. 14. POVERTY POINT, RAZMJESTAJ ZEMLJANIH STRUKTURA TE NJIHOVA ASTRONOMSKA PORAVNANJA



13

14



FIG. 15 OHIO STATE WITHIN THE US
SL. 15. POLOŽAJ DRŽAVE OHIO UNUTAR SAD-A

FIG. 16 SITE LOCATION WITHIN THE STATE OF OHIO
SL. 16. POLOŽAJ LOKALITETA UNUTAR SAVEZNE DRŽAVKE

FIG. 17 MOUND CITY SITE LAYOUT PLAN
SL. 17. MOUND CITY I RAZMJESTAJ ZEMLJANIH STRUKTURA

FIG. 18 MOUND CITY – EAST ENCLOSURE WALL
SL. 18. MOUND CITY, POGLED NA ISTOČNI OGRADNI HUMAK

FIG. 19 MOUND CITY – THREE CENTRAL BURIAL MOUNDS
SL. 19. MOUND CITY, POGLED NA TRI SREDIŠNJA HUMKA



3	SITE NAME:	MOUND CITY
	SITE LOCATION:	CHILLICOTHE, OH
	SETTLEMENT TYPE:	BURIAL SITE
	STRUCTURE TYPE:	MOUNDS, EARTHWORK
	PREHISTORIC STAGE:	WOODLAND – ADENA/HOPEWELL

Mound city complex is a part of Hopewell Culture National Historical Park which is today composed of five different sites (Seip Earthworks, High Banks Works, Hopeton Earthworks, Hopewell Mound Group, and Mound City), in Ross County 6,5 km north of Chillicothe, Ohio, on the River Scioto bank (Figs. 15, 16). The first excavations of the mounds were performed by Ephraim Squier and Edwin Davis of Chillicothe in the 1840s. In one of the mounds, they discovered a deposit of more than 200 animal effigy pipes. Some eighty years later (1920) archaeologists William C. Mills and Henry C. Shetrone excavated several mounds and concluded that the Mound City Group was the best example of Hopewell culture burial area in Ohio and USA.



Following their investigations, the mounds were restored and declared a National Monument in 1923. The site area of 5.26 hectares is framed by a rectangular shape earthwork, less than a meter in height (Fig. 18), with rounded corners (Fig. 17). Within the described enclosure 23 conical and loaf-shaped (burial) mounds could have been found at the time of their first mapping, but today only 12 can be located and identified (most of them were destroyed during the WWI when a military training base was built on a site). The mounds originate from Adena and Hopewell Culture (well known for monumental earthworks in a variety of geometric shapes: circles, squares, octagons, and ovals), as the carbon dating proved the utilization of the site between BC 100 and AD 500. Each of the mounds was constructed above a charnel house, a structure which was burned at the moment of cremation of the dead bodies, and therefore the site is known as Mound City Necropolis. There is no specific order in mound placement within the enclosure. The central group, containing two conical (mounds 18 and 7) and one loaf-bread mound (mound 3), are most representative. Mound no. 7 is a conical mound with a base of nearly 30 meters in diameter and 5 meters of height, while the neighboring loaf mound is about 42 meters long, 24 meters wide at the base and approximately 3 meters high (Fig. 19). As the members of the Hopewell culture were known for trade contacts with other groups residing from the Atlantic coast on the east to the Rockies on the west, their ornaments and objects were made of material that could not found in the neighboring area: of mica, shark and alligator teeth, obsidian, copper, . Inside the mounds (next to the bodies) numerous stone effigy pipes (raven and beaver pipes are the best known), ornaments and other artistic offerings were found. The outstanding examples of copper cutout are the falcon and men profile, or jewel-like pendants in a shape of long-fingered human hand, human torso, snake or talon of a hawk made of multilayered silvery mica employing sharp flint tools.

Moundville site, recognized as a real *Mississippian* one, is situated north of Moundville, some 20 km south of Tuscaloosa (Figs. 20, 22), on Black Warrior River in central Alabama. Covering the area of nearly 1,32 km², it is considered the second largest mound complex in USA, next to Cahokia, and probably best preserved. The site was in use for nearly 5,5 centuries (between 1000 and 1550 AD), with most numbered population estimated between 1200-1300 AD. After 1300, it ceased, along with maintenance of structures, while the area that once served as residential one was transformed into accumulation of graves not older than 1320. This proves the site transformation into burial place and ceremonial center. The final decline and abandonment happened around 1500, for reasons not yet discovered and understood.

Settlement shape is a rough square with four-sided platform mounds built and oriented to cardinal directions around large central plaza (Fig. 21), which was a result of artificially leveling and filling natural depression (up to 1 m deep) next to the river bank. The site was flanked by wooden bastioned palisades along three sides, nearly 1700 meters in length, letting the outside area be used for farmstead residential groups of buildings (estimated number of this population is 1200 + nearly 10000 within the entire valley), while inside the wall higher social-ranking families lived. There were 29 earthen mounds, most of them truncated pyramid sizing between 1 to 18 meters in height, with buildings of different uses on their summits. Interestingly, platforms are regularly distributed from north down to south, by decreasing their height, providing the clue that the north mounds must have been used for most important buildings. Even the burial mounds confirm this: the northern ones (C and D) had artifacts that clearly pointed out they were meant for higher social ranking people in contrast with other burial mounds. The largest and highest mound structure (B) is believed to have been nesting the noble residence building (Fig. 24), which supposed copy has been erected and was ac-

4 SITE NAME:	MOUNDVILLE
SITE LOCATION:	MOUNDVILLE, TUSCALOOSA, AL
SETTLEMENT TYPE:	TOWN/CEREMONIAL CENTER/BURIAL GROUND
STRUCTURE TYPE:	MOUNDS AND PALISADE
PREHISTORIC STAGE:	MISSISSIPPIAN

cessible by two ramps. South of mound B is mound A (Fig. 23), with a strange axis-deviation, which does not coincide with any astronomical alignment. Owing to the size it is presumed to have been used as a platform for main ceremonies. Today, the whole Moundville site is an Archeological park, while after July 19th in 1964 the whole area was recognized as a National Historic Landmark (NHL). The museum is displaying artifacts found on a site like clay effigy pipes or a rattlesnake disk – perfectly round 30 cm in diameter stone disk with engraving of an eye in an open human hand with 2 entwined rattlesnakes around.



FIG. 20 ALABAMA STATE WITHIN THE US
SL. 20. POLOŽAJ DRŽAVE ALABAMA UNUTAR SAD-A

FIG. 21 MOUNDVILLE SITE LAYOUT
SL. 21. MOUNDVILLE, RAZMJEŠTAJ ZEMLJANIH STRUKTURA

FIG. 22 SITE LOCATION WITHIN THE STATE OF ALABAMA
SL. 22. POLOŽAJ LOKALITETA UNUTAR SAVEZNE DRŽAVE

FIG. 23 VIEW OF THE MOUND A, J, K FROM MOUND B
SL. 23. POGLED NA HUMKE A, J I K S VRHA HUMKA B

FIG. 24 MOUNDVILLE – VIEW OF THE LARGEST MOUND B
SL. 24. MOUNDVILLE, POGLED NA NAJVECI HUMAK, B





FIG. 25 ILLINOIS STATE WITHIN THE US
SL. 25. POLOZAJ DRZAVE ILLINOIS UNUTAR SAD-A

FIG. 26 CAHOKIA SITE LAYOUT
SL. 26. CAHOKIA I RAZMJESTAJ ZEMLJANIH STRUKTURA

FIG. 27 SITE LOCATION WITHIN THE STATE OF ILLINOIS
SL. 27. POLOZAJ LOKALITETA UNUTAR SAVEZNE DRZAVE

FIG. 28 CAHOKIA – POSSIBLE APPEARANCE OF THE CITY
SL. 28. CAHOKIA, MOGUCI IZGLJED GRADA



5 SITE NAME:	CAHOKIA
SITE LOCATION:	COLLINSVILLE, IL
SETTLEMENT TYPE:	TOWN, TRADE AND COMMERCIAL CENTER
STRUCTURE TYPE:	MOUNDS, PALISADE, WOODHENGE
PREHISTORIC STAGE:	MISSISSIPPIAN

Cahokia complex was the largest North American prehistoric urban settlement which was located on the Mississippi River floodplain, some 13 kilometers east of St Louis, Missouri (Figs. 25, 27). The Missouri and Illinois Rivers confluence the Mississippi River north of Cahokia, creating the most favorable site position for trade and transportation communications. The whole complex (Fig. 26) was encompassing some 14 square kilometers, out of which only 50% was acceptable for habitation. Today the site is protected as a World heritage Site, covering the area of 8.9 km². Cahokia served as a regional center for the Mississippian culture and it can be observed for nearly 700 years, from AD 700-1400 (700-900 – Late Woodland Phase; 900-1050 – rapid growth; 1050-1100 – development into a city; 1100-1200 – climax of the city; 1200-1275 – decline; 1275-1350 sparsely used; 1350-1400 – reoccupation by Oneota people).

At its peak, Cahokia was populated by nearly 25,000 people (more than London at the same time) and is considered the largest urban place within Americas until 1800, when Philadelphia overtook the leadership.

The spatial structure of the entire city was very diverse: from walled area with a large community plaza (providing space for ritual activities) surrounded by tens of mounds of different shape and size; suburbs spread outside the palisade limits (the length of which was nearly 3.2 km) to outlying villages and remote farmsteads (Fig. 28). These farmsteads played very important role in food production for city population: religious and social leaders, artisans, traders, astronomers and numerous workers needed for construction of mounds and other earthworks. There is an estimate number of more than 120 mounds built within the city limits, out of which only 68 can be observed today. The largest truncated mound is named Monks Mound, after French Trappist monks who lived atop the near-by Mound 48 in the early 1800s. The entire Mound was constructed in four successive terraces, which lasted for nearly 300 years. Owing to a slope wash, the actual size of the mound base is hard to be distinguished but it is estimated to be between 290-320 (N-S direction) and 235-290 meters (E-W direction), depending on a contour line that is used for measuring. Looking at the layout plan of the terraces, a *Sacred Geometry* can be recognized: four terraces follow the *Fibonacci sequence numbers* rule (each subsequent number is the sum of the previous two), from 1 to 5 (Fig. 31). If arcs are drawn connecting the opposite corners of squares we get a spiral (snake or a serpent) – a sacred Moundbuilders' drawing, which represents the connection between Sky and Earth. The entire mound height reached nearly 30 meters and covered the base area of



more than 5.6 hectares. It dominated the surrounding landscape and served as a base for the most important building – a temple or palace sizing 31 by 14,5 and nearly 15 meters in height. This mound is recognized as the largest prehistoric earthen construction in both Americas. It is estimated that over 1.35 million cubic meters of earth had to be dug and carried in baskets to build all the mounds in Cahokia, without the aid of a wheel! The central Plaza did not have recognizable form as it was surrounded with smaller truncated mounds (supporting houses for less important town elite members) spread irregularly. The most common buildings in Cahokia were single-family houses, sizing not more than 6 by 6 meters, topped by a steeply pitched roof thatched with prairie grass (to allow the efficient run-off of rain water). The house walls were coated with daub (a mixture of clay and grass), and had no windows – just a doorway covered by a mat (Fig. 29).

There were some 20 conical (rising as high as 12 meters and serving as burial places) and six ridge mounds in Cahokia. The most peculiar mound is Mound 72 (a ridge mound, 42 by 21 in base and less than 2 meters high) which revealed remains of four headless and handless skeletons suggesting the human sacrifices. Besides, it revealed some evidence that celestial events ruled out the planning of Cahokia: at the mound base large post mold with timber remains have been discovered under the oldest part of the mound 72. The location of this timber would have marked the summer solstice sunrise 400-500 years ago, as seen from a circle center. Like most Native Americans, the Mississippians recog-

nized natural order of the Universe above, and regularity in Time changing. Therefore they built Woodhenge (wooden poles set in a circle), a solar calendar that enabled them to track the movement of the Sun and determine the most important dates. West of Monks Mound, and connected with Mound 72, archeologists found traces of five different woodhenge circles – differing in size and number of poles. The first one had only 24 poles, the second 36, the third 48, the fourth 60 while the fifth, had it been completed, would have 72 poles within a circle (Fig. 32). On the day of spring and fall equinoxes, the rising Sun had aligned the center of the Woodhenge, one determined pole and the front of Monks Mound (creating the image of a Mound giving birth to the Sun) This alignment might have been a signal to start planting or harvesting. Today, a portion of it has been reconstructed (Fig. 30).

Beside mounds, there are some other structures discovered on a site. As mentioned before, the central part of the city was surrounded by a stockade – a wooden palisade consisting of some 30 cm in diameter and nearly 5 meters long oak or hickory logs driven into 1.5 meters deep trench. The stockade had evenly spaced bastions, of different layout shape (Fig. 43.a and 43.b). The whole structure seemed to be plastered with clay (possible protection from fire and moisture).

Cahokia was designated national Historic Landmark in 1964, listed on the National Register of Historic Places in 1966, while in 1982 Cahokia Mounds State Historic Site was set on a World Heritage Sites List, under UNESCO.



FIG. 29 TYPICAL CAHOKIAN HOUSE
SL. 29. TIPIČNA STAMBENA KUĆA CAHOKIE

FIG. 30 CAHOKIA – 3RD WOODHENGE OF CAHOKIA, TODAY
SL. 30. CAHOKIA, TREĆI WOODHENGE DANAS

FIG. 31 MONKS MOUND GEOMETRY AND FIBONACCI NUMBERS
SL. 31. MONKS MOUND I GEOMETRIJA FIBONACIJEVIH BROJEVA

FIG. 32 CAHOKIA – RENDERED SKETCH OF 3RD WOODHENGE AND SOLAR ALIGNMENTS
SL. 32. CAHOKIA, MOGUĆI IZGLED TREĆEG WOODHENGE I SUNČANIH PORAVNANJA

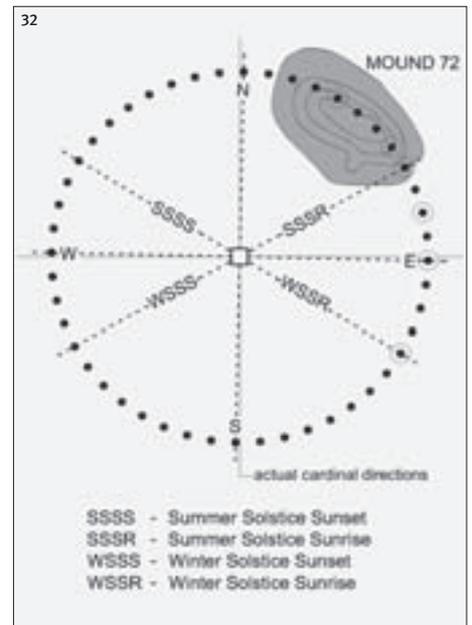
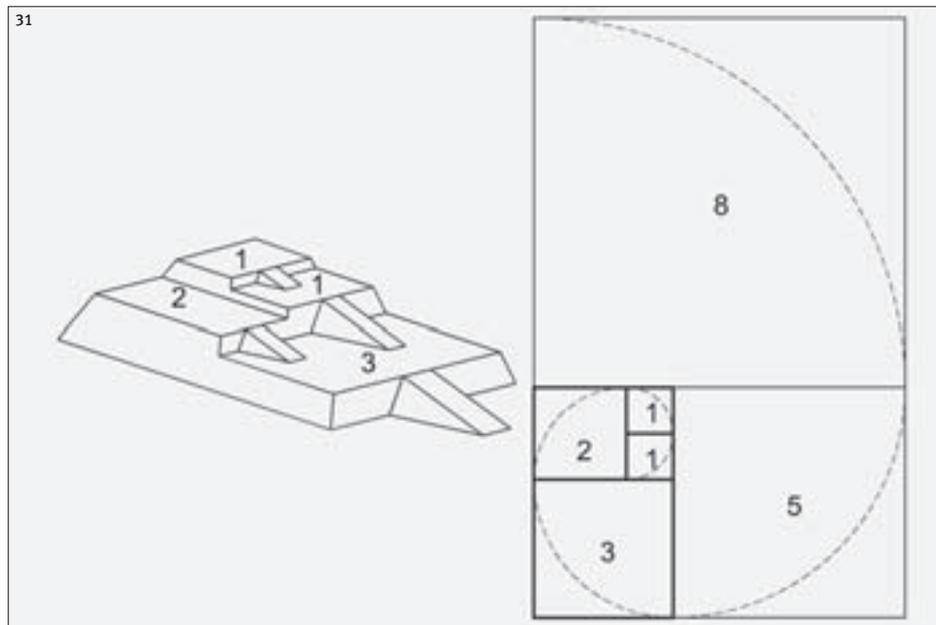




FIG. 33 MISSISSIPPI STATE WITHIN THE US
SL. 33. POLOZAJ DRZAVE MISSISSIPPI UNUTAR SAD-A

FIG. 34 SITE LOCATION WITHIN THE STATE OF MISSISSIPPI
SL. 34. POLOZAJ LOKALITETA UNUTAR SAVEZNE DRZAVE

FIG. 35 EMERALD MOUND SITE LAYOUT
SL. 35. EMERALD MOUND, RAZMJESTAJ ZEMLJANIH HUMAKA

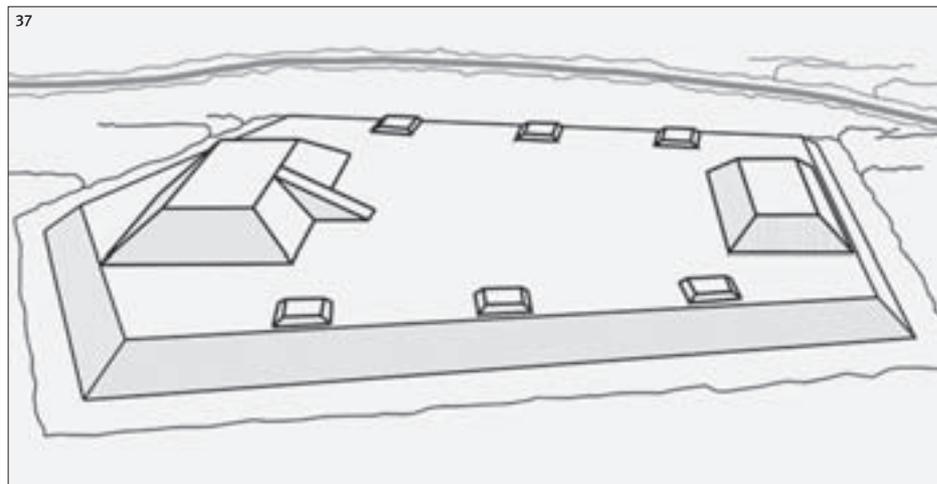
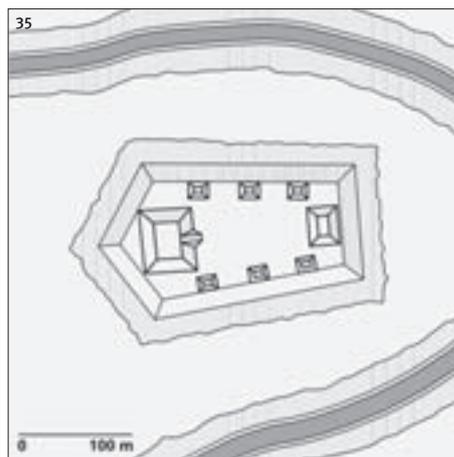
FIG. 36 EMERALD MOUND – VIEW OF THE MOUND ATOP THE LARGE PLATFORM MOUND
SL. 36. EMERALD MOUND, POGLED NA HUMAK NA VELIKOJ PLATFORMI

FIG. 37 EMERALD MOUND – VIEW FROM THE SOUTH
SL. 37. EMERALD MOUND, POGLED S JUGA



6 SITE NAME:	EMERALD MOUND
SITE LOCATION:	NATCHEZ BY MISSISSIPPI RIVER, MS
SETTLEMENT TYPE:	CEREMONIAL CENTER
STRUCTURE TYPE:	MOUNDS AND EARTHWORK
PREHISTORIC STAGE:	MISSISSIPPIAN, PLAQUEMINE

Emerald Mound, the second largest earthwork (known as a platform mound) in the USA after Cahokia's Monks Mound, is located near today's Natchez Trace Parkway, some 15 km north of town of Natchez, near Mississippi river (Figs. 33, 34). The structure has a shape of elongated pentagon, measuring some 210 meters in length, 130 meters of width and more than 10 meters in height (Fig. 35), and covering the area of nearly 3,2 hectares. The main platform mound was erected by depositing soil along the sides of a natural hill and used for three-and-a-half centuries (between 1250 and 1600 AD), and like all other mounds



was built by carrying baskets of dirt and soil (up to 25 kilos each) without any help of horse or other domesticated animals. The Moundbuilders had no knowledge of a wheel, and erecting such artificial structure demanded enormous amount of labor hours! The findings proved that there six smaller and two larger mounds atop of the platform mound (Fig. 37), but today only the larger mounds are visible and recognizable, while the smaller ones were destroyed in the mid of 19th century by plowing. The larger mound was nearly 57 by 48 meters of a size, reaching additional 9 meters in height. The summit of this mound could have been reached by a ramp, which cannot be seen today, but a stairs of logs help in reaching the summit today (Fig. 36). The whole complex, according to the digging results, was used as a ceremonial (religious) center for population that inhabited the surrounding villages and hamlets. Some other findings provide an idea that the site was also used as some kind of a trade center, but some scholars think that the findings served as a part of ritual or offerings. Remains of wooden poles found atop the larger mound near the north edge of the platform mound provided the clue that the summit once had a large ceremonial building atop (probably residence for a chief or a priest), along with few smaller buildings nested on other mounds that were built upon a large earth-platform. This is one of a very few mound structures to have such a large elevated plaza surrounded by other mounds. The site was abandoned at the end of 16th century, when the population moved down south and established new settlement, today known as Grand Village, situated in the very heart of the town of Natchez. Today, the main platform mound is well preserved, along with the second largest mound atop. The whole site has been on the list of National Historic Landmarks since December 20th, 1989.

Serpent Mound, located in Adams County (Figs. 38, 39), Ohio is considered the largest effigy mound in the US and has been on the NHL list ever since July 17th, 1964. The effigy represents the winding (copperhead) Serpent, which can be found around, over the plateau overlooking the Brush Creek valley. This area is displaying the most intense magnetic anomaly in Ohio, which may be caused by huge iron ore deposits, once had been pushed up towards the surface by the crypto-explosive event (meteorite impact or volcanic explosion). The Serpent Mound was first discovered by the archeologists E.G. Squier and E.H. Davis during a routine survey expedition in 1846. Several archeological and scientific expeditions were undertaken after that. Today, the whole area is recognized as a State Memorial Park, which is very well taken of (Fig. 40). The effigy consists of two portions: a serpent body with seven distinct coils apparent in three undulations, which uncoiled reaches the length of more than 400 meters (Fig. 42), and an oval earthwork next to the Serpent's head, which has various explanations: a symbol for solar eclipse (the Sun being swallowed by a Serpent – a figure that is omni-present in Native American legends), a Serpent just after expelling/swallowing an egg, or attacking something. Serpent's body has an average width of 6 meters, while the height varies between 0.6 and 1.5 meters, while the oval is 37 by 18 meters. The oval earthwork is hollow, where a fire-scorched stone was found, which might have been used as an altar. The Serpent mound itself, does not contain any human remains but in the mouth of the serpent blackened stones and stone knives have been found. According to the findings in nearby burial mounds looks that Adena people might have performed human sacrifice: number of headless skeletons had been discovered in burial mounds nearby. Who and when the Serpent mound was built is still debated among scholars: radio-carbon dating of wood charcoal pieces found at nearby burial mounds, placed one piece to the Late Archaic period (early Adena), while two pieces found near the oval were placed at ca. 1070 AD – the Fort Ancient period of a Mississippian culture.

The original assumption that the Serpent Mound was Adena structure was shaken as it was proven that it is actually much younger than the Adena, and is attributed to the Fort Ancient culture (between 1000 and 1550 AD), although this kind of a mound structure is very different from known Fort Ancient structures. The carbon dating attribution of 1070 coincides with two significant astronomic events – the brightest appearance of Halley's Comet in 1066 and the light from the Supernova that created Crab Nebula in 1054 and

7 SITE NAME: SERPENT MOUND
SITE LOCATION: LOCUST GROVE, OH
SETTLEMENT TYPE: ? (CEREMONIAL SITE)
STRUCTURE TYPE: MOUND
PREHISTORIC STAGE: ADENA / HOPEWELL / FORT ANCIENT

remained visible, even during the day, for two weeks. The shape of serpent effigy incorporates various astronomical features: solar and lunar alignments which appear to be exclusive to the Hopewell. In 1993, R.V. Fletcher and T.L. Cameron were first to map some astronomical alignments which suggested that the mound could have served as an astronomical calendar. Ohio archaeologist, archaeo-astronomer and anthropologist W.F. Romain undertook his own mound survey in 1987, determined the true north and confirmed the following astronomical alignments: the serpent's head axes, along with the oval earthwork, is aligned to the summer solstice sunset, while the axes of coils are aligned to the moon's maximum and minimum rising and setting points, along with winter and summer solstice sunrise and the equinox sunrise/sunset (Fig. 41). A line drawn from the top of the tail to the top of a hollow triangle within the serpent head marks the true north orientation! All these bring us to a conclusion: the mound was created as a response to astronomical (celestial) occurrences.



FIG. 38 OHIO STATE WITHIN THE US

SL. 38. POLOZAJ DRZAVE OHIO UNUTAR SAD-A

FIG. 39 SITE LOCATION WITHIN THE STATE OF OHIO

SL. 39. POLOZAJ LOKACIJE UNUTAR SAVEZNE DRZAVE

FIG. 40 SERPENT MOUND SEEN FROM THE PLATFORM

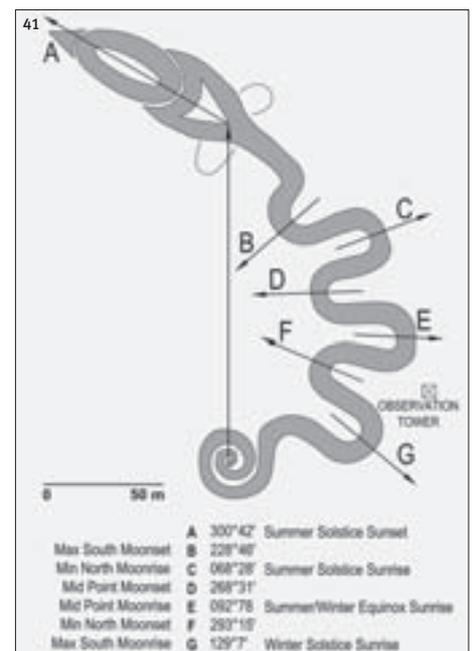
SL. 40. SERPENT MOUND, POGLED SA IZGRADENE PLATFORME

FIG. 41 SERPENT MOUND AND ASTRONOMICAL ALIGNMENTS

SL. 41. SERPENT MOUND I ASTRONOMSKA PORAVNANJA

FIG. 42 SERPENT MOUND FROM ABOVE

SL. 42. SERPENT MOUND, POGLED IZ ZRAKA



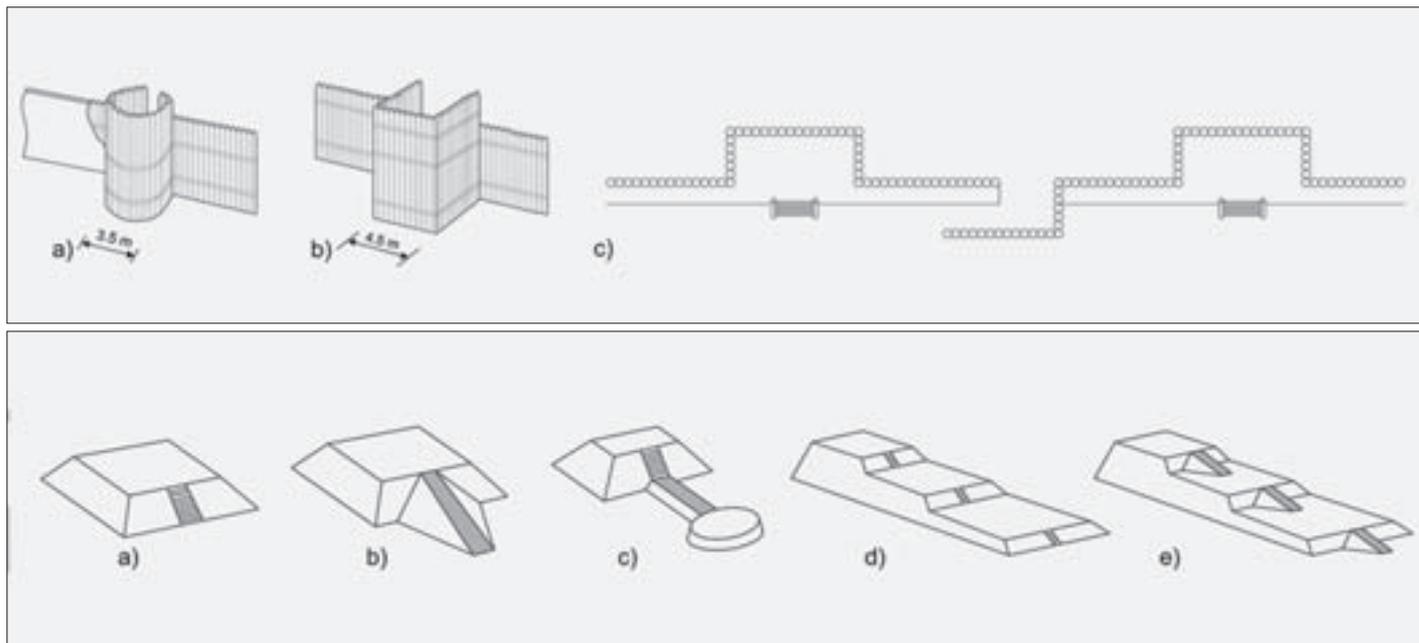


FIG. 43 BASTION SHAPES AND ENTRÉE THROUGH PALISADE WALL

SL. 43. OBLICI BASTIONA I PROLAZA KROZ PALISADE

FIG. 44 STAIRS, RAMPS AND CAUSEWAYS REACHING TOPS OF THE PLATFORM MOUNDS

SL. 44. STUBIŠTA, RAMPE I PRISTUPI DO PLATFORMI NA VRHU HUMAKA

CONCLUSION

ZAKLJUČAK

The following lines should be understood as conclusion lines for this paper, which must not be the end of a research towards the understandings and meanings of North American prehistoric sites and settlements. Distribution of movement (horizontal and vertical) through prehistoric settlements was very important for their inhabitants. The main approach/entrée to the settlement site was through one of the openings within the enclosure (ridge/loaf mounds or palisades). When a palisade³⁰ was used, the entrance could have been realized "by simply omitting a section of the wall, by overlapping the perimeter wall at the point of entry, or by creating towers" (Fig. 43). This kind of entry provided more secure access to the central part of settlement, the access which continued through passages flanked by mounds leading to the open plazas. The most common ascent to the top of mounds was by means of a stairway or ramp, sometimes preceded by a causeway (Fig. 43). The interconnections of mounds

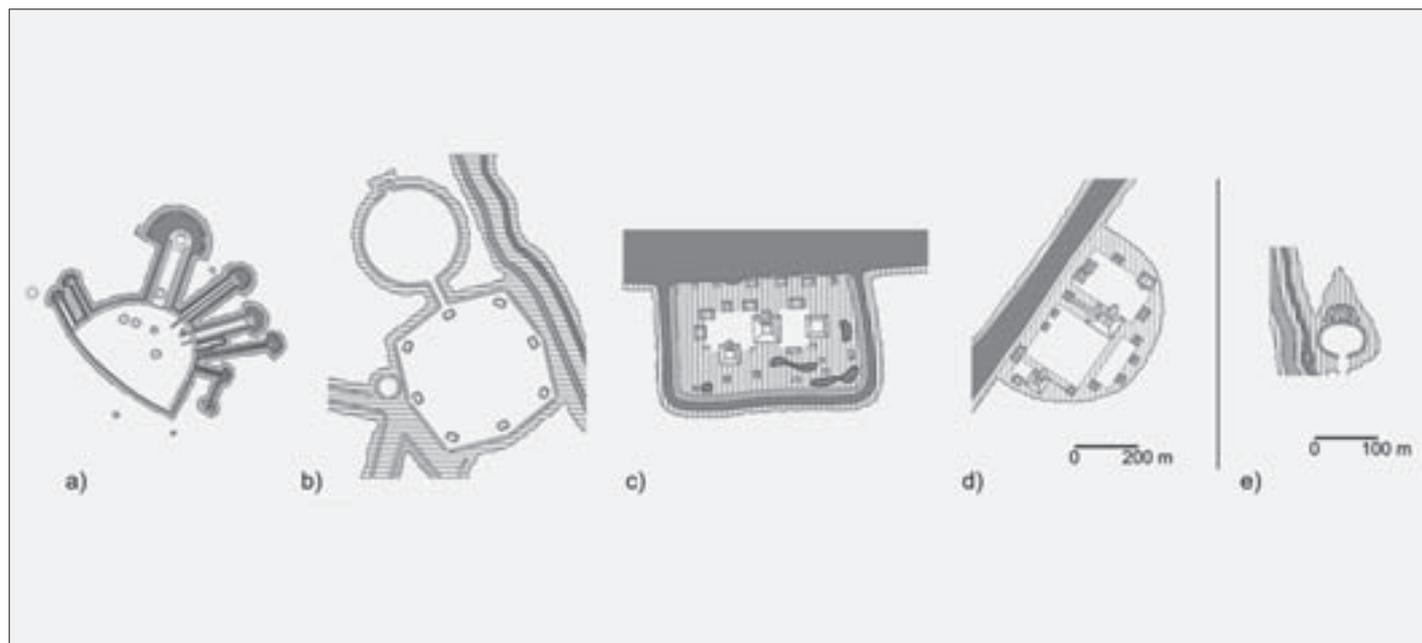
and plazas by causeways within the settlement enclosure created remarkable geometric shapes within the environment (Fig. 45). It is obvious that the approach to some of the mounds within the settlement was very important to the *Moundbuilders*, and played a remarkable role in designing the entire inhabited Place. That Place might have represented an Island in the Sky, an island with sides in four cardinal directions, aligned with the stars above. The inspiration for the design of most of the sites must have been above, in the night sky and the appearance of stars and the moon during a calendar period. Many of the found structure relics prove the role of astronomical alignments in planning the settlements (sites): Poverty Point, Moundville, Serpent mound, Cahokia...

From research performed in the mid-19th century, some 100,000 mound sites (housing 2-100 mounds) were catalogued in the southeastern United States.³² Size, shape and usage very much differed from site to site, but the all-connecting fact was: they were built purposely, either as a settlement or a site for trade or ceremony. The most stunning and

³⁰ The palisades were complex structures. They usually consisted of two parallel earthen mounds and a 3- to 4-foot- deep ditch between. The outside mound was up to 1.5 meters high and topped by 4.5-5.5 meter-long, rot-resistant (pine, oak or hickory) logs 30 cm in diameter. The logs were set upright, nearly 2 meters buried in the soil. Towers or bastions were evenly spaced and projected out from the palisade, and served as platforms for archers (bow and arrows were in use). At the point of entry, the ditch was crossed by an earthen causeway.

³¹ MORGAN, 1980: xxxvii

³² LITTLE, 2009: 2-4



unavoidable truth about mound and earthwork sites is that they are proof that the North American continent was populated by people who possessed knowledge that we have never imagined; they built places not randomly but in a remarkably planned way. They did not leave any design plans or drawings for constructing their settlements, but they were capable of drawing conclusions based on their observation of the skies above. We could assume that all these places were put up vernacularly, without a plan, but we are wrong. There must have been a plan for every single site in somebody's mind, whose mind and reasoning powers were above the others, and who was able to foresee the inevitable rule of Nature and the Universe: the Rule that had to be followed in order to be able to predict the cyclical changes and repetitions over time. There was at least one structure within each site that was built with certain astronomic alignment in order to reveal the change of time (on a daily, annual or even larger astronomic basis).

For reasons not yet understood or discovered, the number of Native Americans de-

clined rapidly in the 14th and 15th century. Those that survived to encounter the arrival of the White Men were faced with diseases brought by these interlopers and by the savage slaughter performed by many of them in order to take gold, silver and other riches back to Europe. Native Americans CANNOT and MUST not be called savages. They were demonstrably sophisticated humans who knew how to observe and draw conclusions from the environment. That quality of human intelligence is more than enough to infer that the artifacts and (dwelling) structures they built were planned structures. We have to admit and finally say: The prehistoric settlements of the Southeast EXIST, they are real, and they were carefully planned. In order to understand their culture and thinking, scholars must continue to search to better comprehend the early Native American mind and figure out what forced or motivated them to create these fantastic structures and places.

[Proofread by:
BARBARA HADENFELDT, Berkeley]

FIG. 45 MOUND SITE FORMS

SL. 45. RAZLIČITI OBLICI IZGLEDA GRUPACIJA HUMAKA

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INTERNETSKI IZVORI

1. www.sciencemag.org
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ILLUSTRATION SOURCES

IZVORI ILUSTRACIJA

- | | |
|---|---|
| FIG. 1 | GELLMAN, 1999: 4-5 |
| FIG. 2 | Sketch: author according to: COE, 1986: 28 |
| FIGS. 3, 14, 21, 22, 27, 34, 35, 41, 45 | Photo: author |
| FIGS. 4, 7, 9, 10, 13, 18, 19, 23, 24, 28, 30, 31, 36, 37, 40, 42 | Sketch: author |
| FIG. 5 | Sketches: author according to: SQUIER, 2007: tab. XLIII |
| FIG. 6 | Sketches: author according to: GELLMAN, 1999: 32 |
| FIG. 8 | Sketches: author according to: MORGAN, 1980 |
| FIG. 11 | Rendering: author according to: www.sciencemag.org/cgi/content/abstract/277/5333/1796 |
| FIG. 12 | LITTLE, 2009: 110 |
| FIG. 15 | Sketch: author according to: GIBSON, 1999: 10 |
| FIG. 16 | GIBSON, 1999: 8-9 |
| FIG. 17 | www.googleearth.com |
| FIG. 20 | SQUIER, 2007: tab XIX |
| FIG. 25 | Sketch: author according to: GELLMAN, 1999: 27 |
| FIG. 26 | GELLMAN, 1999: 23 |
| FIG. 29 | GELLMAN, 1999: 31 |
| FIG. 32 | Sketch: author according to: www.museum.state.il.us/RiverWeb/landings/Ambot/prehistory/archives/images/technology/pages/pttech100ldb2.html |
| FIG. 33 | Rendering: author according to: MORGAN, 1980: 114 |
| FIG. 38 | Rendering: author according to: MORGAN, 1980: 126 |
| FIG. 39 | Rendering: author according to: COE, 1986: 60 |
| FIG. 43 | Rendering: author according to: HAMILTON, 2009: 22 |
| FIG. 44 | www.ohioguide.wordpress.com/2009/10/16/serpent-mound-in-dams-county-ohio |

SUMMARY

SAŽETAK

USPON I PAD SJEVERNOAMERIČKIH PRAPOVIJESNIH NASEOBINA

OBLICI NASELJA I STRUKTURA AMERIČKOG JUGOISTOKA

Iskrcavanje prvih Europljana na tlo današnjeg američkog kontinenta, krajem 15. st., rezultiralo je ne samo susretom dviju civilizacija već i nužnom promjenom u tadašnjim znanstvenim i stručnim poimanjima vrijednosti čovjekova djelovanja. Prva putovanja u unutrašnjost novootkrivenog svijeta te susreti sa lokalnim stanovništvom ukazivala su na postojanje nekad vrlo razvijene kulture na području velike naplavne doline rijeke Mississippi. Iako je većina otkrivenih naselja bila napuštena i polusrušena, u kontaktu s lokalnim stanovništvom europski su „istraživači“ čuli priče o „Moundbuilders“ – graditeljima zemljanih humaka, ali odgovor na pitanje *Tko su graditelji novootkrivenih naselja?* nisu dobili. Današnja suvremena znanost potvrdila je da se naseljavanje sjevernoameričkog kontinenta dogodilo za vrijeme posljednjega ledenog doba (prije 12-15.000 godina), kada se spuštanjem razine mora za skoro 70-ak metara, stvorio kopneni most između Azije i Amerike preko današnjega Beringova prolaza. Azijska nomadska plemena, u potrazi za lovinom, prešla su na drugi kontinent i krenula prema jugu uz pacifičku obalu, prema današnjem jugozapadu ili prema vlažnim i sumovitim prostorima jugoistočnog dijela današnje Sjeverne Amerike. Arheološki nalazi, pronađeni 1926. g. na dva lokaliteta (Clovis i Folsom) na području današnje savezne države New Mexico, potvrdili su postojanje čovjeka na tlu Amerike nekoliko tisuća godina pr. n. e. Prve naznake prijelaza iz nomadskog načina života i stvaranja prvih stalnih naselja potvrđuju ostaci posuda koje su služile za spremanje viška hrane. Najveći broj naselja na jugoistočnom dijelu sjevernoameričkog kontinenta javlja se u vrijeme tzv. *Woodland razdoblja* – razvojem poljoprivrede stvaraju se osnovni preduvjeti za izgradnju prvih stalnih naselja. Najpoznatije kulture toga razdoblja su *Adena*, *Hopewell*, *Mississippian* i *Fort Ancient*, a svaka od njih ostavila je vrlo prepoznatljiva naselja. Najviše podataka o *Adena* kulturi prikupilo se iz zemljanih struktura stožastog oblika (*conical mounds*) koje su koristili za pokapanje mrtvih, dok o *Hopewell* kulturi svjedoče brojne zemljane strukture različitih geometrijskih oblika, veličina i namjena. Temeljna struktura/građevina koja se može naći unutar ovih naselja jest *mound* – zemljani humak, nastao nasipavanjem velike količine zemlje nakon iskopa sa prostora koji su kasnije pretva-

rani u ribnjake. Zemljani humci bili su različitih oblika i veličina. Najpoznatiji oblik je *platform mound* – humak u obliku jednostavne ili višeslojne krnje piramide ili stošca koji je služio kao osnova za izgradnju važnih građevina. *Ridge mound* je zemljani humak izduženog satorastog oblika koji se koriste za postavu trupaca koji su služili za čitanje određenih astronomskih pojava i događanja. Nekada su, kao i *conical mounds* korišteni kao *burial mounds* – humci za pokapanje umrlih. Poseban oblik izduženog humka je *loaf mound* (ili *enclosures*), sa zaobljenim vršnim dijelom, koji se kod *Hopewell* kulture koristio za ograđivanje naselja. Na njih su se postavljale palisade (koje su dodatno bile obložene zemljom s vanjske strane). Jedna od konstrukcija iz *Mississippi* razdoblja posebno je zanimljiva: *woodhenge* – kružni niz balvana zabitih u zemlju, za koje se pretpostavlja da su bili neka vrsta kalendara (pomoć pri praćenju određenih astronomskih pojava i događanja). Poseban oblik zemljanih humaka su *effigy mounds*, humci u obliku životinja ili ljudskih likova. Osim ovih struktura, kao važan element prapovijesnog naselja jugoistoka javlja se trg različitih veličina. Vrlo često se kompleksnost ovih može sagledati tek iz zraka! Prapovijesna naselja američkog jugoistoka mogu se svrstati u pet temeljnih grupa: logor/taborište, zaselak, selo, grad i organizacijski povezana grupa sela ili čak gradova. Po namjeni, razlikuju se kao čisto stambena naselja, vjerska ili pak trgovačka središta. Posebna pažnja bila je posvećena načinu kretanja unutar naselja, kako u ravnini, tako i u prostoru – uz pomoć rampi ili „ugrađenog“ stubišta na kosini humka. Na području SAD-a utvrđeno je preko 100.000 lokaliteta koji sadržavaju do stotinjak humaka u različitim stanjima očuvanosti. Oblik zemljanih struktura, kao i samih lokaliteta, razlikuje se međusobno, ali jedno im je zajedničko: sve su to izgradili *Native Americans* s namjerno određenom namjerom i do sada nepoznatim planom. U članku je obrađeno samo sedam lokaliteta, iz različitih razdoblja i različitih zemljopisnih odrednica. Najstariji poznati lokalitet (ljudsko okupljalište) je Watson Brake u saveznoj državi Louisiana sa 11 humaka nepoznate namjene i korištenja. Nesto sjevernije je jedan od najstarijih „planiranih“ lokaliteta – *Poverty Point*. Sastoji se od 6 koncentričnih širokih zemljanih nasipa nekad visokih do 1,5 me-

tar, a koji su služili kao platforme za izgradnju kuća, te nekoliko zemljanih humaka različitih oblika u čijem se međusobnom razmještaju mogu očitati neka astronomska poravnanja. *Mound city* kompleks, u južnom dijelu države Ohio, predstavlja primjer ograđenog *Hopewell* naselja s naglašenim geometrizmom. *Cahokia*, u zapadnom dijelu države Illinois, predstavlja pravi primjer planiranog grada koji je u vrhuncu svog postojanja mogao imati preko 20.000 st. Središnji dio grada bio je ograđen palisadama ukupne duljine više od 3 km, dok se u sirem području grada nalazilo na tisuće manjih poljoprivrednih domaćinstava koja su proizvodila hranu za brojno stanovništvo. Brojnost i različitost oblika zemljanih i ostalih struktura je velika, a najviše se ističe *Monk's Mound*, najveća i najviša zemljana građevina u obje Amerike (300×260 metara). Visine od preko 40 metara, sa svoje 4 terase i više rampi daje naslutiti strukturu u kojoj se prepoznaje *Fibonacci niz*, osnova ideje o velikoj spirali/ zmiji, koja je inače smatrana svetom životinjom *Moundbuildersa*. Tu je i pronađen prvi kalendar – *Woodhenge* uz pomoć kojega su mogli pratiti astronomske pojave i promjene (zimski i ljetni solsticij, proljetni i jesenski ekvinocij, ...). Lokalitet *Moundville*, u središnjem dijelu države Alabama, korišten je između 11. i polovice 16. stoljeća, a svoj vrhunac doseže u 13. stoljeću. Unutar ovog naselja bilo je tridesetak zemljanih humaka u obliku krnjih piramida, pravokutne osnove. U državi Mississippi, uz istoimenu rijeku, nalazi se drugi po veličini zemljani humak na tlu Amerike – *Emerald mound*, čija tlocrtna veličina doseže 210×130 metara, s visinom od preko 10 metara. Jedan od najintrigantnijih zemljanih humaka, *Serpent Mound*, nalazi se na jugu države To je najveći poznati *effigy mound* koji predstavlja zmiju, duljine od preko 400 metara, širine skoro 6, a visine do 1,5 metra. Rep zmije je u spirali, a ostatak tijela je presavijen u tri uzastopna zavoja čije se simetrale pružaju u smjeru krajnjih položaja izlaska i zalaska Mjeseca tijekom godine. Iako nisu poznavali pismo (ili ono do sada još nije pronađeno), *Moundbuilders* su očito bili u stanju matematički sagledavati prostor te prepoznati astronomske pojave. Većina ovih lokaliteta zakonom je zaštićena kao kulturno ili povijesno dobro, a neki se nalaze i na Listi svjetske baštine (*Cahokia*).

NENAD LIPOVAC

BIOGRAPHY

BIOGRAFIJA

Prof. **NENAD LIPOVAC**, Ph.D. teaches at the Faculty of Architecture, University of Zagreb where he received his MS in 1994. His Ph.D. was a joint venture between Zagreb Faculty and College of Environmental Design at Berkeley and was completed in 2000. At the same College he performed his post-doctoral research in 2003 (Fulbright grant) and 2006/7 upon the topic: History of Making American Cities. During these Berkeley visits he had numerous invited or regular academic lectures.

Prof. dr.sc. **NENAD LIPOVAC** zaposlen je na Arhitektonskom fakultetu Sveučilišta u Zagrebu. Magistrirao je 1994., a doktorirao 2001., provodeći većinu svog istraživanja na College of Environmental Design, UC Berkeley. Na istom fakultetu, kao stipendist Fulbrightove fondacije, 2003. g. provodi 10 mjeseci postdokorskog istraživanja – *Povijest nastanka američkog grada*, te ponovno 2006./07. Tijekom tih boravaka održao je brojna redovna i pozvana predavanja.

