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THE BEGINNING OF
PREHISTORIC SETTLEMENTS
OF THE AMERICAN SOUTHWEST

ORIGINAL SCIENTIFIC PAPER
UDC 711.423:903.3 (73)

POČETAK NASTANKA
PRAPOVIJESNIH NASELJA
AMERIČKOG JUGOZAPADA

IZVORNI ZNANSTVENI ČLANAK
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FIG. 1 PREHISTORIC CULTURES SPREAD IN THE SOUTHWEST REGION, KNOWN AS *FOUR CORNERS*
 SL. 1. RASPROSTRANJENOST PRAPOVIJESNIH KULTURA I ZAJEDNICA AMERIČKOG JUGOZAPADA, POZNATOG KAO *FOUR CORNERS*

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THE BEGINNING OF PREHISTORIC SETTLEMENTS OF THE AMERICAN SOUTHWEST

POČETAK NASTANKA PRAPOVIJESNIH NASELJA AMERIČKOG JUGOZAPADA

AMERICAN PREHISTORIC CULTURES
AMERICAN PREHISTORIC SETTLEMENT
AMERICAN SOUTHWEST
CLIFF DWELLINGS
PUEBLOS

AMERIČKE PRAPOVIJESNE KULTURE
AMERIČKA PRAPOVIJESNA NASELJA
AMERIČKI JUGOZAPAD
NASTAMBE U STIJENI
PUEBLOSI

This paper represents the continuation of the research (from the planer's view) on the American prehistoric settlements, but this time of the Southwest. The Southwest was a cradle for numerous cultures and communities which have left astonishing masterpieces of Places which they have erected between 7th and 13th century AD, in order to make their living easier in this arid and hot environment. Structural and location differences, along with author's personal observation and experience, have been inter-compared and presented. The main conclusion for this research can be summarized in a few words: despite the lack of the written and calculus skills, they had the knowledge of how to observe the Universe above and make conclusions on sequences of celestial events through the design of their settlements.

Ovaj članak predstavlja nastavak planerskih istraživanja provedenih na temu nastanka američkog prapovijesnog naselja, ali ovaj puta naselja američkog Jugozapada. To područje je poznato i pod nazivom *Four Corners* te predstavlja kolijevku brojnih kultura i zajednica koje su ostavile zapanjujući broj naselja izgrađenih u razdoblju od 7. do 13. stoljeća, u tom suhom i iznimno vrućem krajoliku. Strukturne razlike, kao i razlike u njihovom položaju, uz autorova osobna razmišljanja i analize nakon obilaska istih, predstavljeni su u ovom članku. I ovaj puta se može zaključiti da su sve te kulture, unatoč nepoznavanju pisanog jezika, imale veliko znanje i sposobnost zaključivanja na temelju promatranja kretanja vidljivih svemirskih tijela, a što su onda prenosili u planiranje svojih naselja i struktura.

ARCHAIC HUNTERS – GATHERERS

ARHAJSKI LOVCI I SAKUPLJAČI

There is no doubt now that the first bands of humans crossed the land bridge between Asia and North America around 10000 BC. As nomads, they were pursuing big game, had the knowledge of how to make and sustain a fire, how to make tools out of flintstone or bone and how to protect their naked body with fur and animal skin. But they were not aware that they were becoming an important cornerstone for the New World cultures. These early **Desert Archaic people** travelled in small bands in search for food and water and lived in caves and other natural shelters found during the time they wandered. Climate changes from tropical to arid around 8000 BC due to the melting of polar ice caps resulted in warmer and drier weather with less rainfall in the region of today's Nevada and the western part of Utah State. This brought about a change of vegetation and the extinction of big game and consequentially big game hunters' habits. During next two millennia some new groups appeared, known as the **Paleo-Indians**. With the absence of big game, the Paleo-Indians hunted smaller animals and modified their hunting weapons from stones and sticks, spear and atlatl to bow and arrow in later stages. They also shifted to a more vegetarian diet which required a broader knowledge of when to collect and harvest various wild berries and seeds. Seeds demanded a much different approach as far as food preparation was concerned: they had to be finely grounded to become digesti-

ble – so they invented a tool – a seed grinder¹ which reduced seeds to powder. This flour was used to make *flat cakes* that could even be baked on stone by fire. As they collected and stored the seeds, some of them fell on fertile soil and grew into a new plant the next season. Around 3000 BC, this new experience undoubtedly led to the adoption of farming as a new life style. Planting more productive plants like corn, beans or squash demanded a return to the fields, at harvest time which led to the creation of settlements inhabited on a seasonal basis. Fields had to be watered to produce a fruitful crop which initiated the digging of wells and canals for drinking and/or watering. With the expansion of their agricultural activity and number of plant varieties, the ancestral Puebloans faced another need: food surplus storage facilities. Basket-making was another advance in their life style, a step towards food storage and also inspired the name for the people who "invented" these baskets – *Basketmakers*² Although the baskets were not the perfect storage vessel,³ their imperfection resulted in a quest for better options. In a transition phase between baskets and pottery, gourds were used, which served as a basis for soon to be "invented" pottery jars, pitchers, and bowls. The pottery proved to have better storing qualities, improved cooking and increased variety in the diet. Although the pottery was not nearly as portable as lightweight baskets they became more in use

¹ The seed grinder consisted of a hollowed stone slab (containing seeds) and a piece of a stone [WALKER, 1994: 12] that was held in hands while rolled over the seeds, known as *metates* and *manos* [MAILS, 1983: 28].

² An amateur archeologists, Richard Wetherill, excavating and collecting puebloans remains in the caves of Grand Gulch in southeast Utah in 1890 found well preserved basketry, woven matting and cord, stone tools and wooden sticks for digging soil and planting (hallmarks of these ancestral puebloans).

³ Baskets were not air-tight and the surplus of food could not be preserved for a long time. Cooking food in baskets was not the case, either. Only medium heated stones could be placed in baskets, but the food would not be fully cooked and the heated stones would destroy the basket, which caused limitation of prepared food.

⁴ HOUK, 2010: 6

⁵ Another change occurred in usage of Puebloan structures: with the emergence of sedentary settlements, social classes differentiated through the material the upper class might have used. This could be recognized through the findings of goods in several graves, meaning an increasing importance of the spiritual world!

⁶ During the conference in Pecos, NM (summer 1927) several major and minor cultures of the Southwest were determined, along with periods of their appearance. Prior to that, only two successive cultures within the *Four Corners* area had been recognized: foraging people named *Basketmakers* and later people the Spaniards used to call *Puebloans* (because of their villages *pueblos* with stone or adobe buildings). The conference adopted the so-called *Pecos Classification* distinguishing three *Basketmakers* and five *Puebloans* periods: *Basketmaker I* (300-100 BC), *Basketmaker II* (100 BC – 500 AD), *Basketmaker III* (500-700 AD), *Pueblo I* (700-900 AD), *Pueblo II* (900-1100 AD), *Pueblo III* (1100-1300 AD), *Pueblo IV* (1300-1600 AD), *Pue-*

as they were easy to manufacture, suitable for storing, cooking over fire, and were waterproof. The first settlements had several small, brush-and-pole structures called pithouses – (Fig. 2) built above shallow or purposely scooped-out depressions in the ground, covered by branches, barks and leaves, and plastered with mud. The population increase led to the enlarging of the year-round village size and the number of residential structures within it. The size and shape (circular, square, rectangular) of pithouses differed and became more sophisticated. The main pithouse construction had “four vertical posts joined with ceiling joists, and was then overlaid with a lattice of slender poles, brush and grass or bark matting (Fig. 3), partly plastered with mud which provided extra weather protection. A central fire hearth in the floor served for cooking and heating, ventilated through a side shaft and a smoke sent through a roof hatch”.⁴ This kind of a dwelling structure was common and in use for over 2000 years, but some 1300 years ago, a major change⁵ occurred: subterranean structures were replaced by ones above ground.

CULTURAL TRADITIONS OF THE SOUTHWEST

KULTURE AMERIČKOG JUGOZAPADA

The desert and arid area of the Southwest can be observed through two distinct sub-regions: the *Great Basin* and the *Plateau*. With-

in the *Great Basin* all rivers flow inward, from the rim of the mountains towards salted lakes (Great Salt Lake in Utah) where water stagnates and evaporates leaving a residue of minerals. There is no river outside the *Basin* that brings water into it; short periods of rainfall are not enough to fill the lakes and rivers with needed water so they stay dry for most of the year. As a result of such climate conditions, a large population could not have lived within the Basin. On the other hand, the *Plateau region* had the presence of more moisture in the atmosphere and rivers streaming towards the ocean. The fish from the rivers provided the prehistoric *Plateau* cultures with food supplies and surplus, which was taken into the *Basin* for trade. By the 1st millennium BC, these cultures⁶ settled in semi-permanent villages with semi-subterranean housing structures known as earth lodges. Today, several different cultures are distinguished by their way of life: three major and several minor prehistoric traditions, each of them inhabiting a particular area of the prehistoric Southwest (Fig. 1). They are: the **Hohokams** (desert agricultural cultural group), the **Mogollons** (hunters and gatherers) and the **Anasazi** (cliff dwellers). The minor cultures are the **Salado** (Tonto Basin in Arizona), the **Sinagua** (city of Flagstaff and Verde valley area), the **Fremont** (eastern Utah under the Anasazi influence) and the **Patayan** (Colorado River region).

blo V (1600-present day). Further modification of *Pecos Classification* is (*Roberts Classification* introduced in 1935), was more descriptive in naming: *Basketmaker* (1-550 AD) and *Modified Basketmaker* (550-750); *Developmental Pueblo* (750-1100), *Great Pueblo* (1100-1300), *Regressive Pueblo* (1300-1600) and *Historic Pueblo* (1600-present). [MAILS, 1983: xiv-xv]

7 The arrival of this culture is set at around 300 BC. Their name is originating from the *Pima* language meaning “those who have vanished”. They could have been either descendants of Cochise (archaic) people, or immigrants from Mexico, or just local descendants of ancient hunter-gatherers that had responded to Mesoamerican influences and emerged as Hohokams.

8 More than 300 miles of canals have been discovered ever since in the Salt River Valley.

9 The periods are: *Pioneer period* (300 BC – 550 AD), *Colonial period* (550-900 AD), *Sedentary period* (900-1100 AD), and *Classic period* (1100-1450 AD).

10 The rectangular shape lodges were between 1000 and 2200 square feet in size with two narrow entrances and two fire hearths within. A framework of vertical post roof supports was covered with flat or slightly pitched roof while the sloping walls were made of brush and grass and then plastered by mud from outside.

11 First signs of social segregation appeared: lodges for higher ranked village members were closer to the central plaza.

12 The platform mounds usually were up to 10 feet high, rectangular in base and sizing from several hundred to several thousand square feet. Atop the platform, a construction like a “temple” was built and used either for ceremonies or important tribe members gathering. The ball court was some 10-12 feet deep oval shaped excavation which served for (sacred) games, while the excavated soil was used for erecting the platforms.

Hohokam – The culture that inhabited the *Sonora Desert* region (covering 45,000 square miles) is known by the name of Hohokam⁷ and their arrival and origins are still the subject of scientific debate. Despite the arid conditions, these highly sophisticated farmers dug wells to tap underground water sources or created the irrigation system⁸ that helped in watering their farmland planted with corn (maize), beans, barley, cotton, tobacco. Today, four major periods⁹ of the Hohokam culture can be identified. The first one is characterized by the appearance of small villages with several clusters of lodges¹⁰ (Fig. 4) erected around an open courtyard and situated in the vicinity of rivers. The areas outside of these clusters were used for cremations of the dead and cemeteries, along with so-called work-sites for preparing food or arts and crafts. During the second (colonial) period, the villages became larger, populated by more than 1000 residents, with some lodges built around a central community plaza.¹¹ As a result of the Hohokam’s trade and cultural connections with the Mesoamericans, the appearance of platform mounds¹² and ball courts can be observed during the third period. The excavation of canals continued, some of which were used for delivering water from springs into prepared “cisterns”. This period

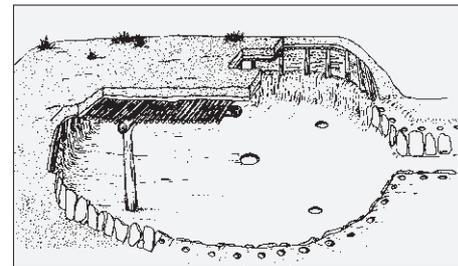


FIG. 2 ARTIST'S RECONSTRUCTION OF A PITHOUSE
SL. 2. REKONSTRUKCIJA IZGLEDA PRVIH ZEMUNICA



FIG. 3 RECONSTRUCTED PIT HOUSE, STEP HOUSE NP MESA VERDE

SL. 3. REKONSTRUIRANA ZEMUNICA, STEP HOUSE U NACIONALNOM PARKU MESA VERDE

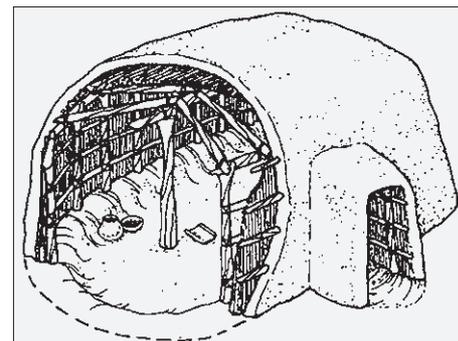


FIG. 4 ARTIST'S RECONSTRUCTION OF HOHOKAM LODGE
SL. 4. REKONSTRUKCIJA IZGLEDA NADZEMNOG SKLONISTA HOHOKAM KULTURE

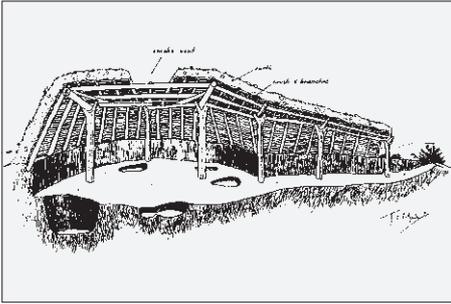


FIG. 5 EXTENDED MOGOLLON PITHOUSE
SL. 5. IZDUŽENI OBLIK ZEMUNICE MOGOLLON KULTURE

is recognized as the peak of the Hohokam culture with a notable expansion of trade towards the Gulf of California, Pacific coast and Texas. Around 1100 AD, the Hohokams, for reasons not yet understood, abandoned their villages and returned to their original sites in southern Arizona. During the last, *Classic* period the Hohokams major changes in village and architecture design are notable: the villages became larger and walled (palisades plastered by clay) with only one entrance point (a portal) or even none (entering only by means of a ladder), while most buildings were aboveground in adobe style. They continued on platform mound construction plastering the sloping sides. The end of this period introduced new architecture: multistory "great houses" with massive and very thick walls (up to 6-7 feet) at the base point. The purpose of these houses is still uncertain, although some of them suggest astronomical purposes! The best known Hohokam sites are *Casa Grande Ruin*, *Montezuma Well* (part of the *Montezuma Castle* site), and *Snaketown* (*Skoaquick*) in Arizona. During 1100-1150, the Hohokam culture was joined, or displaced by the *Sinagua* culture.

Mogollon – This culture was named after the Mogollon Mountains¹³ bordering the east of the San Francisco River valley, and spanning the area between Arizona and New Mexico (Fig. 1). Like the Hohokams, they are believed to be the descendents of a *Cochise Desert Archaic* culture that occupied the Southwest some 5-6000 years BC. The early Mogollons were hunters and gatherers on the move without any sedentary structures. Around 200 BC, they probably served as mediators in introducing corn into this region; the plant that became a staple in their diet and caused a food surplus which had to be stored. First they stored the food in small stone-lined pits, and then they developed pottery. Having more food, around 500 AD they started a more sedentary life in communities that consisted of several semi-subterranean lodges (pithouses), built on mountain ridges and high mesas.¹⁴ As the size of villages grew, so did the shape and size of their residential structures. In the heart of nearly every Mogollon village, there was a large underground pit (some 30-35 feet in diameter) that served as a ceremonial house – the *protokiva*, with a ramped or stepped entrance facing east. In later periods, they extended their pithouses consisting of more than one room (Fig. 5) which slowly changed their shape into a rectangular (from 600-900 AD). They constructed water control structures (reservoirs and dams) needed for irrigating their terraced fields all year around. Some 10 centuries ago, a significant shift in Mogollon architecture occurred (probably influenced by the Anasazi entry into their territory): the subterranean

rounded residential structure was replaced by a rectangular one built above ground with sandstone blocks except for the underground *kiva* which was still present. To preserve the room from outside heat or cold they plastered the walls with mud – an *adobe pueblo* was born! The sites attributed to the Mogollon culture are: *Gila Cliff Dwellings* and *Casa Malpais*.¹⁵ More than any other *Southwest* culture, the Mogollons left a rich and vivid graphic record of their existence and religious beliefs: images on stone (petroglyphs) and pottery. The religious ceremonies occurred on an annual basis proving that the Mogollons tracked solar movements and celestial events and had the knowledge of some kind of calendar! The last traces of this culture disappeared around 1450 AD (Mogollon settlements were abandoned before the Spaniards stormed the Southwest in search for gold).

Anasazi – The Anasazi¹⁶ are considered to be descendants of an Archaic Desert culture that roamed the Southwest some 6000 BC, or even a branch of the Mogollon culture that came from the south. This culture is best known for their cliff dwellings in which they lived. After probable migration from dry Nevada areas to the San Juan drainage basin, today known as the Four Corners (Fig. 1), they occupied caves for the first 1000 years. Later they built ramadas¹⁷ and pithouses creating small communities, gathering and hunting food. The first *Basketmakers* villages followed no plans: the pithouses and ramadas were spread around without any order. The introduction of corn, around 500 AD, changed

¹³ The mountains were named after the Spanish colonial governor from 18th century as the archeologists did not want to affiliate any living Native American tribe to the new culture which remains they had found. The first ones to distinct the Mogollons as a different culture were archeologists H. S. Galdwin and Emil W. Haury.

¹⁴ One of the sites that exhibit the first Mogollon circular pithouses is a *Bluff Site* in Arizona's White Mountain region. The pithouses were dug into the sandstone bedrock but lacked the elements that later pithouses had: ventilating duct, deflector, benches for sitting inside and a *sipapu*.

¹⁵ In Spanish meaning *Badlands House*, is one of the last pueblos occupied by the Mogollons. During the excavations in 1990, wide range of tunnels and chambers (up to 50 by 100 feet in size, numbering 60 to 80 rooms) were found and most of them had human skeletal remains.

¹⁶ The name of *Anasazi* is derived from the Navajo language and can be variously translated: "ancient people who are not us" or "enemy ancestors" or just "the ones that came before us". The word was adopted by the archeologist A.V. Kidder who wanted to name the culture whose traces he found in the region of Four Corners. Today, Puebloans prefer the other term "Ancestral Puebloans" rather than *Anasazi*, which is considered rather disrespectful.

¹⁷ Ramada is an open-air shelter consisting of four vertical posts connected with a set of horizontal roof poles that were covered with branches, dry grass and brush. This first artificially created construction was probably used for work (sun protection) and outdoor sleeping during hot weather conditions.

¹⁸ A cist is a purposely dug hole in sandstone, which floor and edges were faced with thin sand stone slabs. Lar-

their way of life into a more sedentary one, causing a food surplus which had to be stored. The first storage areas for perishable food and belongings were dry cave corners, later to be exchanged by cists,¹⁸ baskets and finally pottery vessels. As they became a more stable farming community, the Anasazi constructed more permanent houses which revealed their main characteristic – adaptation to the environment. Throughout their presence they managed to accommodate their way of living according to the dictates of nature: sand rock formations like mesas, alcoves and river plains. Around 700 AD (*Developmental Pueblo* period), most of the pit-houses were replaced by aboveground structures with the exception of the *kiva* (Fig. 6), whose size enlarged and has not changed significantly to this present day. The architectural details of a *kiva* are unique (Fig. 7), although after 1200 AD (*Classic Anasazi Era*) some of them were built partially above ground. A round or square walled room was roofed by a flat construction of horizontal wooden beams supported by stone pilasters set on a bench along the room edge and criss-crossed by another set of beams covered with bark, brush, dry leaves and plastered with mud. The entrance was through the roof hatchway by means of a ladder. The floor had a fire pit, a deflector slab, a ventilator opening and a shaft. A small round hole on the floor, placed halfway between the fire pit and the north wall, was called *sipapu*.¹⁹ During the *Pueblo III* stage larger settlements were built within the alcoves below the mesas rim,

ger cists were even plastered with mud and floor bedded with dry leaves and bark. There is a strong belief it served as a model for later introduction of pithouses. After a pithouse was built, a need for storage nearby introduced an extended pithouse: main room connected with a smaller storage room through a tunnel, which was used as a covered entryway (during the late *Basketmaker* period was always south of the main pithouse).

19 *Sipapu* hole symbolizes a "mythical place of emergence through which the Anasazi ancestors passed their journey from the inner earth, where they were created, to the surface of the living-in world. It is also an opening through which the souls of the dead return to the Underworld. One of these souls is *Katchina*, a spirit who comes and goes through *sipapu* in order to bless the Puebloans on ritual occasions". [MAILS, 1983: 121]

20 Out of more than twenty sites in National Park Mesa Verde region, the most outstanding ones are *Balcony House*, *Long House*, *Spruce tree house*; while in National Monument Canyon de Chelly the best representatives (although much smaller) are *White House ruin*, *Antelope House ruin*, *Three Turkey ruin*, ...)

21 The culture was named after the Spanish word for Salt River – *Rio Salado* which valley served as a cradle for this prehistoric Puebloan culture. The first one to use this word for describing the remains of culture spread along the Salt River drainage was the archeologist Harold Gladwin in 1930 [HOUK, 2010: 3], but anthropologist Erich Schmidt in 1925, through his findings of pottery, was the first to suggest Salado as a new culture.

22 *Togetzoge* is the Apache word for a place "where a creek with yellow water joins a clear one". [HOUK, 2010: 5]



which were suitable for living as they provided natural weather protection and cool shelters, along with secure places. The most distinct Anasazi alcove settlements are the ones in *Mesa Verde*²⁰ (CO), and in *Canyon de Chelly*, (AZ). A transition between the alcove settlements and the adobe aboveground structures can be seen in *Bandalier* (NM), *Betatakin* and *Kiet Siel* (AZ). The most outstanding site for aboveground structures of prehistoric Pueblo can be found in Chaco Canyon, National Historic Monument (NM). Besides *Pueblo Bonito* (four storey D-shaped pueblo), there are ten aboveground structures and one semi subterranean one (*Casa Rinconada*), which is known for celestial orientation and calendar readings. The Anasazi abandoned their land for reasons that are still unclear and moved southward without any traces of new settlements. Their descendants, the Hopi and Zuni tribes, still occupy some of the original pueblos like *Acoma*, *Taos* and *Laguna*. Through these migrations, the Anasazi merged either with the Mogollon in the south of New Mexico or with the Hohokams in south and central Arizona.

Salado – The Salado²¹ culture settled at the bottom of the White Mountains of eastern Arizona, known as *Tonto Basin*, between 1150 and 1450 AD, representing some sort of a cultural mixture between the Anasazi emerging from the north, the Hohokam from the west and the Mogollon from the east (Fig. 1). Most of the Salado villages were erected on flat terraces in river valleys, surrounded by farmland. The best preserved site is *Togetzoge*:²² a single-storey pueblo structure (over 100 rooms) surrounding the central plaza and inhabited between 1250 and 1350 AD. Salado villages were surrounded by walls, with a compound used to store the surplus of crops prior to trading it with neighboring regions. Within some of these compounds were flat-topped mounds, built by adding walled portions outward and upward (later filled by everyday debris and dirt). Some of the platforms might have served as elevated plazas where people met and traded goods. One outstanding architectural detail introduced by the Salado culture is a long covered entry corri-

FIG. 6 CHANGE OF A PITHOUSE INTO ABOVE GROUND STRUCTURE – PUEBLO, AND SUB TERRAIN STRUCTURE – KIVA
SL. 6. RAZVOJ ZEMUNICE U NADZEMNU GRADEVINU – PUEBLO I PODZEMNU – KIVA

FIG. 7 KIVA C, CLIFF PALACE, MESA VERDE NP
SL. 7. KIVA C, CLIFF PALACE U NACIONALNOM PARKU MESA VERDE

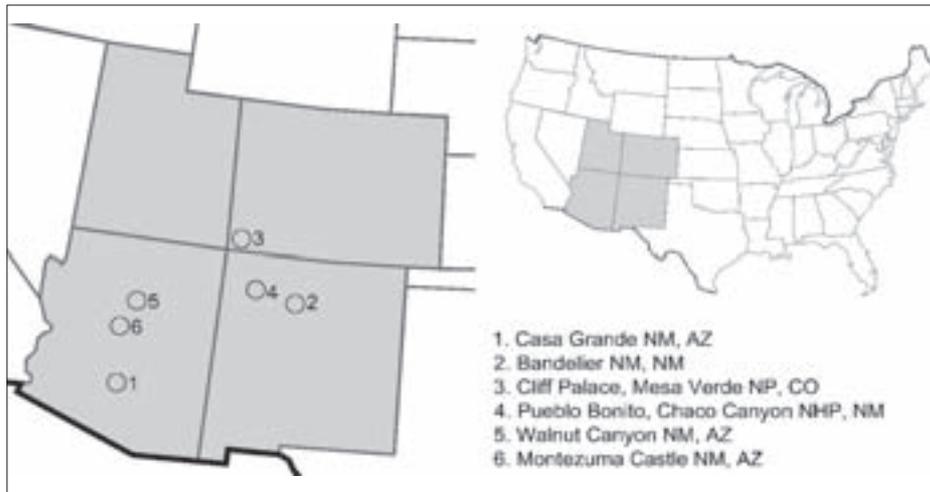


FIG. 8 FOUR CORNERS REGION WITH SITE AND SETTLEMENT LOCATIONS

SL. 8. PODRUČJE FOUR CORNERS S POLOŽAJEM NEKIH OD ISTRAŽENIH NASELJA

dor leading into the pueblo (*Besh-Ba-Gowah* site near Globe, AZ). In the mid 15th century, they abandoned their communities and moved elsewhere probably assimilating with the Hopi (Arizona) and the Zuni (New Mexico) tribes, but no evidence for this theory has been found.

Sinagua – The Sinagua²³ culture inhabited the central Arizona area (Fig. 1) overlapped by the Hohokam, Mogollon and Anasazi cultures in two major branches: northern (the area of today's city of Flagstaff and the surroundings of San Francisco Peaks, starting at 500 AD) and southern that inhabited the Verde Valley area beginning in 700 AD. The Sinaguas were trade mediators between all these cultures, but were also influenced by these cultures in many ways: the Anasazi cliff dwelling and pueblo style housing replaced their pithouses (*Walnut Canyon* site and *Wupatki* site), Hohokams' ball courts (*Wupatki* and *Winona* village) and Mogollons' irrigation system which can be evidenced on many sites. Agriculture was at its height during 1150-1220 AD. The best settlement examples can be found at the following sites, today recognized as National Monuments: *Wupatki*, *Walnut Canyon*, *Tuzigoot*, *Montezuma Castle* and *Montezuma Well*. The northern Sinaguas arrived to the Verde valley in the early 14th century due to the long period of drought, but they all abandoned this area around 1425 AD.

Fremont – The *Fremont* tradition developed in Southern Utah, under the possible influence of the Anasazi Culture. The earliest traces of this culture dates back to 400 AD, but it is still unclear if they were a local group influenced by the Anasazi, or a part of the Anasazi itself that had migrated to Utah. The abandonment of their sites began in the mid of the 10th century, while their total disappearance dates back to 1300 AD, leaving no clues as to why.

Patayan – In scientific literature, the Patayan tradition is also known as Hakataya. It is considered to be a peripheral tradition of the Southwest Prehistory culture and carried out by the Hokan-speaking tribe of the Colorado River region. They appeared around 500 AD but never established larger settlements than villages. There is a scientific belief that they had been descendents of the Sinagua culture of Central Arizona.

ABANDONED SETTLEMENTS

NAPUŠTENE NASEOBINE

As noted previously, the cultivation of plants had a very strong impact on the cultures of the Southwest, enabling them to settle more sedentary life and build sizable communities with different structures: from pithouses to multistory above ground adobe dwellings, from ball courts to mound platforms. The position of the community sites differed according to the topographical and climatic features of the environment: from villages in open plains, nearby creeks and rivers, settlements upon high rise mesas or alcoves just below the mesa rim. There are hundreds and thousands of discovered sites and villages that reveal the way of living within the Southwest in prehistoric time. The Hohokams constructed over 200 oval-shaped, earthen-sided structures throughout southern and central Arizona.

The beginning of the 12th century in Arizona was marked by several significant changes: burial practice of cremation was expanded; ball courts were gradually abandoned, while the flat-topped, rectangular-shaped earthen structures (platform mounds) were built. Villages became more formally organized. Caliche homes were grouped into caliche-walled compounds, which were arranged around public plazas and structures. It was difficult to decide which one to discuss in this paper, but some selection had to be made and it was done according to cultural origins and visual appearance (size, shape and type of the above structures and their usage).

Therefore, as the case studies for the topic of this paper the following sites, in three different states have been chosen (Fig. 8): **Casa Grande**, **Walnut Canyon** and **Montezuma Castle** in Arizona, **Bandelier** and **Pueblo Bonito** in New Mexico, and **Cliff Palace** in Colorado, all on the basis of the settlement structural difference, size, position, and built structure types.

²³ The name was given by Harold S. Colton in 1930's comprising two Spanish words into one: *sin* (without) and *agua* (water) – *Sinagua*.

1 SITE NAME:	CASA GRANDE NM
SITE LOCATION:	COOLIDGE, AZ
SITE AREA:	472.5 ACRES (191.2 HA)
STRUCTURE TYPE:	MULTI-STORY PUEBLO, BALL COURT, WALLED COMPOUNDS
CULTURE:	HOHOKAM

The most notable of the Hohokam's surviving structures are observable at **Casa Grande Ruins**, the ancient Hohokam farming community from the Classic period. The whole site can be observed through two compounds: A and B (Fig. 9). Within the compound A there were several buildings completely surrounded by a defensive wall measuring nearly 210 by 420 feet in floor plan, and some 10 feet in height; and without any doorway! As Hohokams did not domesticate any animals they needed no gateways: the village inhabitants used ladders to get over the wall. Inside this wall there were nearly 50 rooms. The rise of the defensive wall, forming the village compound could have been a proof for establishment of permanent villages.

Within the compound B an oval ball court was discovered, plus several above-ground structures that are still under survey. Of all the structures, the *Casa Grande* in compound A, was probably built the last. This four-story structure (Fig. 11), having 5 room at the ground level and 11 rooms altogether, was built around AD 1300-1350 and abandoned for about 550 years before it was "discovered" by a Spanish missionary Padre Eusebio Francisco Kino in 1694. This structure exposed a new method of construction: previously used, so called post-reinforced wall was exchanged by a new one: massive walls²⁴ of solid caliche – a sedimentary rock (CaCO₃) which cements together other materials like gravel, sand, clay, and silt, that could support multi-room and multi-story dwellings erected by Pueblo people.

Villages with scattered one-room dwellings disappeared opening the *entrée* for a new type of building – compact block of rooms, known as pueblo. The *Casa Grande* was obvi-

ously designed to compensate the lack of natural elevations which would have enabled the inhabitants to observe the needs for canal maintenance and water regulation – and possible approach of the enemy. The tower room, some 35 feet above the ground, stands on walls resting on hardpan five feet below the present ground level and four feet thick at their base; these walls are part of the 5-room base of the tower, with the entire ground floor filled for additional bracing, and the 5-room plan carried up to the third-story set back (Fig. 10). Details of wall load, weight distribution, and room dimensions were evidently well considered before construction began. According to detailed observation of the structure, some of the Archaeologists speculate that it may have been an astronomical observatory: small round window on the west wall (Fig. 12) aligns perfectly with the setting sun on the summer solstice, while some other openings line up with the sun and moon at significant dates throughout the year). *Casa Grande Ruins* became the nation's first archeological preserve in 1892 and National Monument in 1918.



FIG. 9 CASA GRANDE RUIN FROM ABOVE
SL. 9. CASA GRANDE RUIN, POGLED IZ ZRAKA

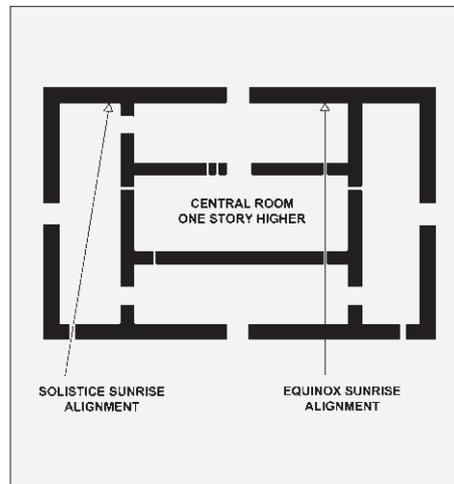


FIG. 10 CASA GRANDE GROUND FLOOR PLAN AND WALL OPENINGS ALIGNED WITH THE SUNRISE CHANGES
SL. 10. TLOCRT CASA GRANDE I OTVORI NA ZIDU PORAVNATI S IZLASCIMA SUNCA

FIG. 11 CASA GRANDE TODAY
SL. 11. CASA GRANDE DANAS

FIG. 12 THE INTERIOR OF CASA GRANDE TODAY AND THE WHOLE ON THE WEST WALL
SL. 12. UNUTRAŠNOST CASA GRANDE I OTVOR NA ZAPADNOM ZIDU



²⁴ The mud brought in baskets was dumped and spread out and molded with the hands until about two feet of the wall had been built up. Why so? They had the knowledge (or experience from previous masonry) that if they built higher at the time the weight of the mud would squeeze the freshly laid lower layers. By the time they had built the first wall layer, they could start from the starting point as the first part of the course was dry and hard enough to bear the weight of another course or layer. This resulted in constructing wall in monolithic courses, without the use of bricks, blocks or forms.



FIG. 13 DOORWAY WITH A VENT SHAFT ON THE FRONT WALL OF ONE OF MANY CLIFF CHAMBERS
SL. 13. ULAZNA VRATA T-OBLIKA, S OTVOROM ZA DIM I VENTILACIJU IZNAD

2 SITE NAME:	WALNUT CANYON NM
SITE LOCATION:	FLAGSTAFF, AZ
SITE AREA:	3540 ACRES (14,33 KM ²)
STRUCTURE TYPE:	CLIFF-DWELLINGS
CULTURE:	SINAGUA

The location and the state of preservation of buildings found in the 600 feet deep **Walnut Creek Canyon**²⁵ carved into the wooded plateau, southeast of Flagstaff (Fig. 8), make this site an important place for the research of the cliff-dwellings construction rules. The height difference between the canyon rim and the bottom is nearly 350 feet. People that roamed this area at the beginning of the 11th century took the advantage of natural elongated alcoves protected from sun, wind and rain (Fig. 14), and built nearly 50 dwellings with about 300 rooms. Atop the rim there is also an evidence of several groups of pit houses and proto-pueblo building remains. All mentioned structures could have supported the community up to several hundred people (named Sinagua who occupied the region from about 1100 to 1250 AD).

The prehistoric masons did not use timber for constructing their homes as they did not need it for roof or floor construction, except for making a door lintel. For the rest of the construction they had used shaped limestone

blocks laid in a clay mortar to construct just the front wall and the partition walls, but not the back wall, taking the advantage of the natural characteristics of the alcove (Fig. 15). Once they would finish the main wall masonry, they would continue on plastering the inside and outside wall. As the family grew, or the need for the storage space increased, additional rooms were added, either connected with the existing rooms by means of a door, or by the passage way along the alcove. The average size of a room was roughly 70-80 square feet. The entry door was a small T-shaped opening with a small hatch above. The upper part of the door was covered with a mat enabling the fluctuation of cold air into the room through the bottom door opening, and hot air and smoke live the room through the mentioned small hatch above the doorway (Fig. 13). They did not use any furniture, but huge pottery jars were found inside the dwellings, capable to hold up to hundred liters of water, stored after hauling it from the canyon floor. Beside cliff dwelling, Sinagua people are known for building check dams in washes in order to catch the runoff water for watering their farmland organized at the canyon floor. It is still unknown what were the reasons for their soon disappearance: it might have been loss of wild game as they cleared the wood on the top of the rim for farming land; or the corn depleted the soil nutrients faster than expected; or too many dry seasons. There are so many questions and answers but none of them can be accepted as a real proof.

FIG. 14 WALNUT CANYON AND THE DWELLINGS
SL. 14. STAMBENE STRUKTURE U WALNUT CANYON



FIG. 15 LINE-UP OF ROOMS IN AN ALCOVE
SL. 15. NIZ IZGRADENIH PROSTORIJA UNUTAR PRIRODNOG UDUBLJENJA U STIJENI



²⁵ Walnut Canyon was proclaimed a National Monument in November 1915, by president Woodrow Wilson.

3 SITE NAME:	MONTEZUMA CASTLE NM
SITE LOCATION:	FLAGSTAFF, AZ
SITE AREA:	860 ACRES (348 HA)
STRUCTURE TYPE:	CLIFF-DWELLING
CULTURE:	SINAGUA

The first Euro-American settlers who came into the central Arizona region (Fig. 8) discovered this five-story structure within an alcove high above the ground (Fig. 16) were astonished by its appearance, made erroneously conclusion it must have had served as a palace or a castle of an emperor – the Aztec emperor Montezuma and named it **Montezuma Castle**.

But the truth was different: the Sinagua ruin had been abandoned nearly 100 years before Montezuma was even born, and the Aztecs never reached that far to the north. After the detailed research of the ruin, the scientists concluded that not even the idea of a castle was true as the findings within the chambers of the structure proved only it had served as some kind of a prehistoric multi-family housing complex.

Why building the Home so high above and hard to approach, when there were no proofs found of life-threat enemies? The answer to this question might be similar to the ones asked about the reasons for other cliff dwellings inside the alcoves: firstly – no need for roof and back-wall construction, and secondly – they already knew these alcoves were cool in summer and warm in winter (with low

winter sun warming the front walls). In addition, they were secured from seasonal flooding of the Beaver Creek.

At the beginning, first six rooms were constructed at what is now third floor, hauling roof beams of sycamore tree, and needed masonry material lifted in baskets with ropes of yucca fiber. The wall was two feet thick at the bottom, and one foot at the top. The front wall slightly is curved conforming to the form of the cliff and the alcove itself. It is not known how long the construction lasted but there were some 4 to five stages of construction during which twenty rooms were built (Fig. 17). The approach to the dwelling was possible by means of ladders set next to the cliff side.

Another detail astonishes: the front (façade) wall rises above the last ceiling – a parapet wall 2.5 feet in height which embraces the spacious terrace protected by the sloping ceiling of the alcove that might have been used for work or community gathering (Fig. 18). In addition to this structure, at the bottom of the cliff there are remains of a larger structure: forty-five room pueblo, named *Castle A*. Because of a fire in the late 1400s, it is not as preserved as the *Montezuma Castle*. Scattered remains of pithouses and field houses around the creek valley witness the area been populated with more than 300 residents that could have lived here, including the dwellings at the nearby *Montezuma Well* site, which name speaks for itself: the water from the well was a major life vein for neighboring farming communities. The *Montezuma Castle* site itself is not opened to the public now-a-days and can be observed only from the creek valley floor.

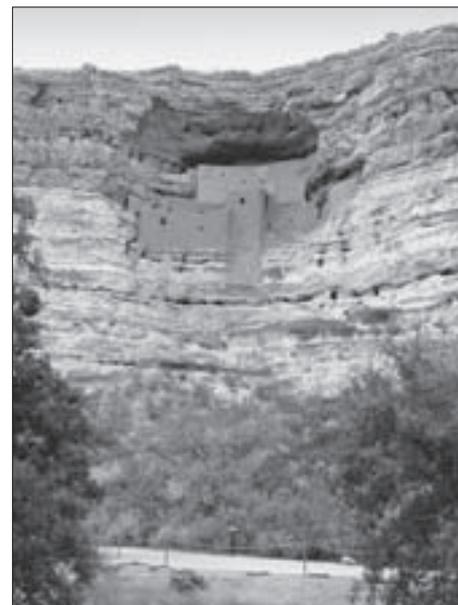


FIG. 16 MONTEZUMA CASTLE AS SEEN FROM BELLOW
SL. 16. POGLED NA MONTEZUMA CASTLE IZ DOLINE

FIG. 17 MONTEZUMA CASTLE AND THE CONSTRUCTION SEQUENCES
SL. 17. FAZE IZGRADNJE STRUKTURA U MONTEZUMA CASTLE

FIG. 18 CROSS-SECTION OF THE MONTEZUMA CASTLE
SL. 18. PRESJEK KROZ KONSTRUKCIJU MONTEZUMA CASTLE

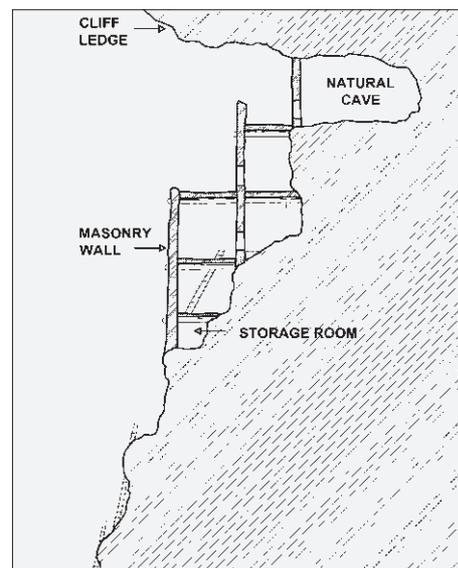
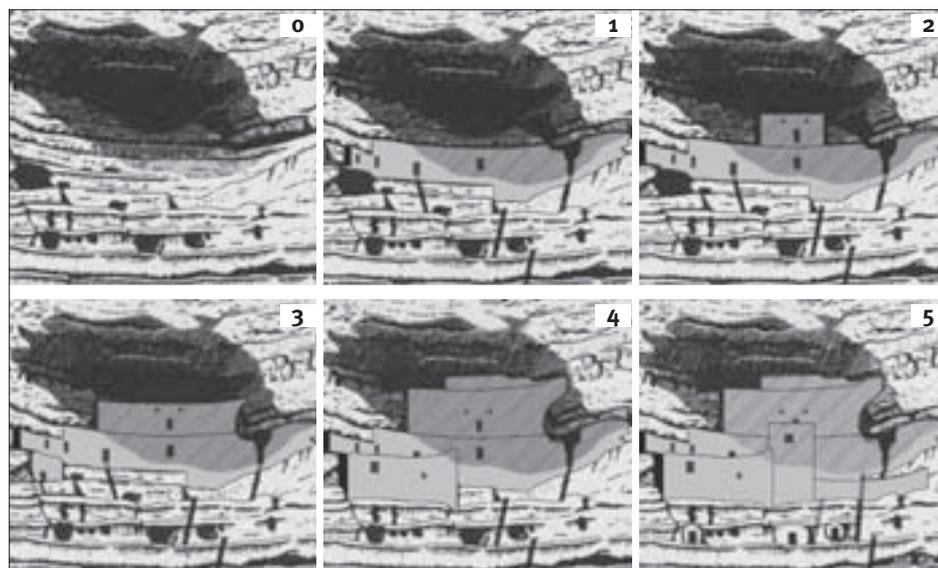




FIG. 19 LONG HOUSE AND THE VOIDS ALONG THE CLIFF WALL
SL. 19. LONG HOUSE I NIZ ISKOPANIH SPILJA U MEKANOJ STIJENI

FIG. 20 ALCOVE HOUSE, 150 FEET ABOVE THE CANYON BOTTOM
SL. 20. ALCOVE HOUSE, 45 METARA IZNAD DNA KANJONA

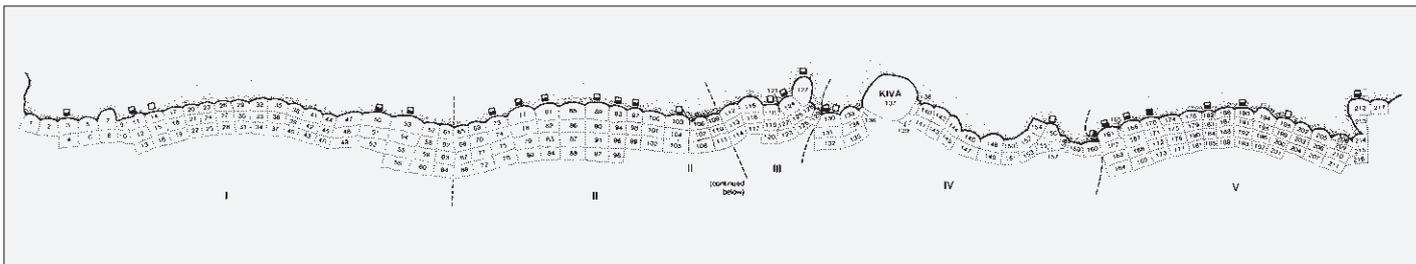
FIG. 21 THE GROUND FLOOR OF THE LONG HOUSE STRUCTURE
SL. 21. TLOVIS STRUKTURE LONG HOUSE

FIG. 22 TYUONYI PUEBLO AS SEEN FROM ONE OF THE CLIFF VOIDS OF THE LONG HOUSE
SL. 22. POGLED NA TYUONY PUEBLO IZ JEDNE OD UREĐENIH SPILJA LONG HOUSE

4 SITE NAME:	BANDELIER NM
SITE LOCATION:	LOS ALAMOS, NM
SITE AREA:	10,300 ACRES (4,170 HA)
STRUCTURE TYPE:	FREE STANDING STRUCTURES, HUMAN ALTERED NATURAL CAVATES, STRUCTURES WITHIN ALCOVE
CULTURE:	ANASAZI

Pueblo ruin sites found in Frijoles Canyon, **Bandelier** National Monument,²⁶ in northern New Mexico (Fig. 8) date from Pueblo III and Pueblo IV periods. There are three major categories of settlement types that can be found there: free standing ones built at the valley floor (*Rainbow House* or *Tyuonyi* pueblo), rooms built next to- and carved out in soft volcanic tuff of the canyon cliffs (*Long House*), and finally the sub- and above terrain structures built in the alcoves high above the canyon floor (*Alcove House*). *Tyuonyi* is the largest of all found valley-floor pueblos and contains more than 300 ground-floor rooms (Fig. 22) arranged around a central plaza. Outer ring portions had two to three floors above the ground what brings nearly to total of 500 rooms and a housing facility for nearly 550 residents. As to most of the above-ground structures, the only way to enter the room was by means of a ladder stretched through an opening in the ceiling. The building materials were blocks of volcanic lava²⁷ laid into a soft mud mortar. The only entrance to the plaza was possible through a narrow passageway on the east portion of the "walled" pueblo.

Next to it, there is the longest pueblo ruin, named *Long House* (Fig. 19), a set of several room clusters containing 360 rooms built in 1-4 rows parallel with the cliff-wall. The flat, contiguous roof above the last story rooms was probably used for ceremonies, while the tuff cliff wall served for different impressions of rock art (pictographs and petroglyphs) or for creating additional storage rooms in natural or purposely carved out voids (Fig. 21). Horizontal rows of holes mark the position of roof beams, while some portions of the cliff face above or inside the rooms have been smoothed or even plastered. Some 1.5 miles deeper into the canyon, a hiking trail leads to another example of the living structures – *Alcove House*. This is a typical example of Anasazi proto-cliff dwelling "built" within an alcove some 150 feet above the *Frijole Creek*. The cave (at 90 feet of height) can be reached by means of a ladder trail and does not have any visible above-ground structures, except one well preserved (or the author of this paper would like to use the word – reconstructed) *kiva*, and several voids within the alcove (Fig. 20) – there are notable traces of some 20 masonry-walled rooms that can be imagined through the existence of holes for roof beams. The highest population of the whole site corresponds to the period of a wide-scale migration which occurred during the great drought of the Pueblo III period, but is believed never to have exceeded 1,000 inhabitants. The pueblo groups were definitely abandoned by 1600, and residents probably moved to the region today known as Cochiti and San Ildefonso pueblos.



²⁶ The whole protected area was named after Swiss anthropologist Adolph Bandelier who entered the Frijoles Canyon in 1880. The area was designated a National Monument in February 1916.

²⁷ Spilled out from the *Valles Caldera* volcano that had erupted some 1.14 billion years ago.

5	SITE NAME:	MESA VERDE NP
	SITE LOCATION:	CORTEZ, CO
	SITE AREA:	52,000 ACRES (211 KM ²)
	STRUCTURE TYPE:	CLIFF-DWELLINGS
	CULTURE:	ANASAZI

Some of the best (preserved) examples of **Anasazi** culture (Fig. 8) cliff dwelling pueblos can be found in Mesa Verde National park²⁸ in the southwest corner of Colorado state, where there are more than 20 large communities built inside the alcoves or atop the rim. The largest community and the cliff dwelling settlement is the one named *Cliff House*. It contains more than 200 rooms and over twenty *kivas* (Fig. 23), among which the most outstanding buildings are two four-story buildings (towers) that are a recognizable highlight of this cliff dwelling. The third level of the south tower has some very colorful wall paintings in red. Most of the chambers were plastered from inside and outside. The structures were built one next to another following the "topography" of the alcove floor with a very little or no public space at all (Fig. 26). The only open space can be found in front, by the edge which was formed behind the supporting wall. This narrow strip of public space is "enriched" by six to eight *kivas*, out of which some are in a very good condition. During its peak time it must have housed up to 350 people. Even some smaller sub-alcoves in the upper level, close to the alcove ceiling were remodeled into residential chambers. Little below the mid of the floor plan remains of a circular tower can be noted. The approach to the alcove dwelling is along the narrow trail pass with a starting point on the opposite side of the rim. Beside this one, there are several more cliff dwellings like *Balcony House* and *Spruce Tree House*. The approach the *Balcony House* is the most exciting adventure as it is only approachable by means of very steep ladders, while leaving can be performed through a very narrow crack in the rock, at the end of the alcove, which takes the visitor straight to the top of the mesa. It consists of 44 rooms and two *kivas*, built along two courtyards in the alcoves (Fig. 24) connected by a narrow passageway. At its peak it has housed up to 100 residents. The most noted and visited cliff dwelling is *Spruce Tree House* (Fig. 25) with 114 rooms and 8 *kivas*. This dwelling is recognized as the best preserved one, with most of the

structures built up to the very ceiling of the alcove. As some of the *kivas* are fully subterranean, their roof can be understood as the open public place. Some of the beams of the second story roof are still visible, creating an idea of possible narrow balcony construction, or just a roof plateau for drying fruits and seeds. Beside the cliff dwellings (more than 30 of different size and preservation status), in Mesa Verde NP there are other structures that can be connected with Anasazi culture: numerous pithouses, ruins of above-ground pueblo dwellings of different size, shape and form. The most interesting one is the named *Sun Temple*, which consists of two concentric D-shaped walls with space in between divided into smaller rooms. These walls were enclosing two *Kivas* that were above ground with the entire volume, as the whole structure was built on the bedrock sandstone. Some sites were occupied for longer period, so that they mirror several cultural periods, like the *Step House Cave* (Fig. 3) which has remnants of earliest pithouses (Basket Maker III period) plus small pueblo cliff dwelling (Pueblo III period). The main characteristic of the cliff dwelling settlements is the lack of public spaces which could be the result of the limited space of the alcoves. *Kivas* played the very important role for community and religious gatherings. The remains of structures from these periods can also be found atop the whole mesa.

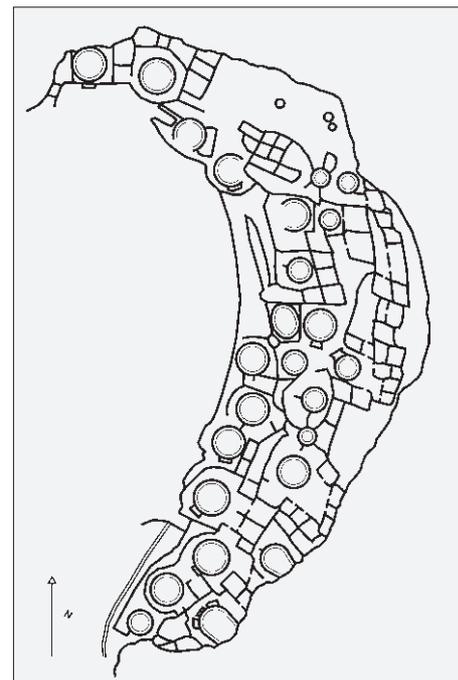


FIG. 23 *CLIFF PALACE*: GROUND FLOOR PLAN
SL. 23. TLORS PRIZEMLJA GRADEVINA UNUTAR *CLIFF PALACE*

FIG. 26 *CLIFF PALACE*: AS SEEN FROM AN APPROACHING TRAIL PASS (PAGE BOTTOM)
SL. 26. POGLED NA *CLIFF PALACE* (SASVIM DOLJE)

FIG. 24 NORTH COURTYARD OF THE *BALCONY HOUSE* WITH A PARAPET WALL BY THE EDGE OF THE ALCOVE
SL. 25. SJEVERNO DVORIŠTE I OKOLNE GRADEVINE *BALCONY HOUSE* S PARAPETNIM ZIDOM NA RUBU



FIG. 25 *SPRUCE TREE HOUSE*: 2-3 STORY BUILDING WITH A T-SHAPED DOORS
SL. 25. *SPRUCE TREE HOUSE*: VIŠEETAŽNE ZGRADE S OTVORIMA T-OBILKA



²⁷ This area was established as a national park in 1906. In 1966 the park was listed on the National Register of Historic Places (HRHP), and in 1978 was designated as a World heritage Site.

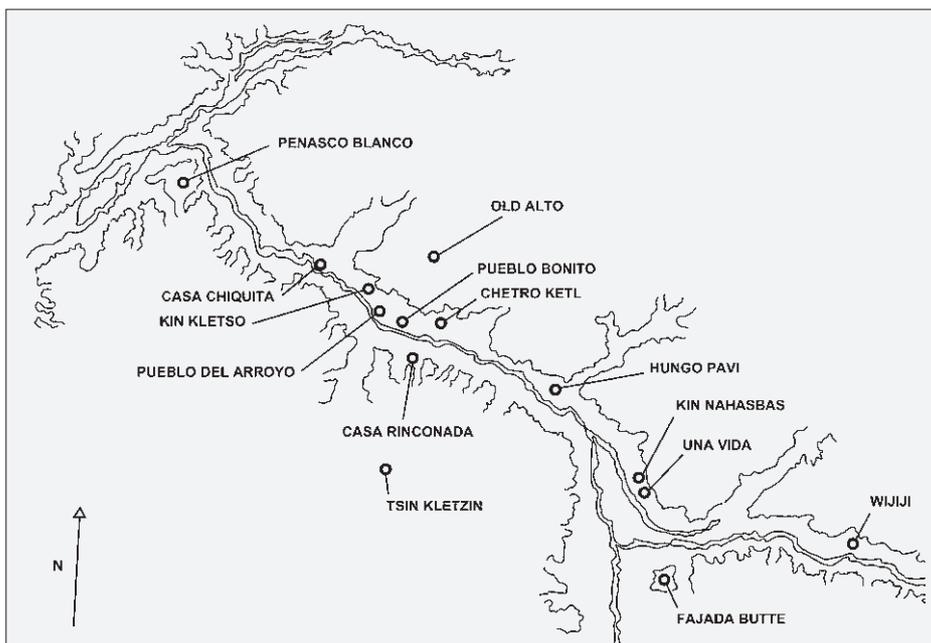


FIG. 27 ONE OF THE CORNER WINDOWS IN PUEBLO BONITO
SL. 27. JEDAN OD UGAONIH PROZORA U PUEBLO BONITO

6 SITE NAME:	CHACO CANYON NHP
SITE LOCATION:	SAN JUAN COUNTY, NM
SITE AREA:	40,000 ACRES (137,5 KM ²)
STRUCTURE TYPE:	PUEBLO
CULTURE:	ANASAZI

The plateau of **Chaco Canyon**, northwest part of New Mexico (Fig. 8) is recognized as one of the most desolate places in the world: wind-swept rock and sand landscape with very few trees and sagebrush; no game or animals (except for snakes and lizards), no rivers just several occasional flash flood water. The cliffs (walls of mesa tables) are not that high and breathtaking as the ones described in Mesa Verde NP, and the climate is hot and dry in summer and freezing cold in winter. Regardless all mentioned and not mentioned environmental characteristics, which were not much different 12-8 centuries ago, the Anasazi people managed to live their lives and establish remarkable settlements employing surprisingly "scientific" methods in watering the dry land and building their settlements. Chaco Canyon, today recognized as National Historic Park, is divided from the rest of the world by some thirty miles of dirt road, and even more miles from first sizeable contemporary settlement. Approaching the park, the rare visitors will notice a solo-standing rock called *Fajada Butte* rising 380 feet above the valley floor, between the East Mesa and the south wall of Chaco Canyon that once

FIG. 28 CHACO CANYON SITES
SL. 28. LOKALITETI UNUTAR CHACO CANYON



served as an astronomical (solar) calendar point.²⁸ The Chaco Canyon NHP has 12 astonishing sites (Fig. 28) with very unique structures and buildings.³⁰ The most outstanding site is, by no means, D-shaped *Pueblo Bonito* complex (Fig. 29), nested at the foot of a sheer mesa cliff, 135 feet high and measuring 550 feet in length and over 350 feet in width. The Chaco Canyon was inhabited for more than 300 years, while the life of *Pueblo Bonito* spans the period of nearly 150 years (919-1067). Inside this wall compound, at its peak, there were more than 800 rooms of different size and usage which could have been occupied by more than 1,200 inhabitants – making it the largest "apartment building" of this World for nearly 8 centuries. The *Pueblo Bonito* settlement started its appearance in late 830's when only pithouses and several storage units could have been seen (Pueblo I stage). During Pueblo II (919-936) one-story (partially arch) structure with living rooms was erected. But even this early phase showed there great observation and construction knowledge: a line connecting two opposite corners of the above ground structure was pointing towards the summer solstice Sunrise (Fig. 30). During four periods to follow, the whole settlement was built representing a fantastic D-shaped enclosed compound, reaching the five-story height along the northern curb-edge-wall. The rooms were arranged in terraces, allowing the entrance without, or with very few front doors, only by means of numerous ladders. Bottom floor rooms were interconnected by a lined-up set of doors. There were very few windows on the surrounding walls, so the whole place looked much like a fortress, but some of the windows are remarkable by its positioning: they were set in the upper corner of two walls (Fig. 27). By careful monitoring, some of the windows can be recognized as unique openings allowing summer or winter solstice sunlight to enter the room and mark specific spot on the floor or the wall – another solar calendar. This settlement had a well-planned central public space divided in two portions by a double wall, bordered with 20 *kivas*. During these periods, Chacoan builders have also

29 The top of this butte is an epitome of solar observation: three stone slabs were laid next to the rock leaving a narrow crack passage through which the sun light would pass and mark both summer and winter solstice and the equinoxes on two spiral petroglyphs. This *Sun Dagger* was discovered by the archeologist Anna Sofaer in 1979. Unfortunately the slabs have moved, and the site is closed for public.

30 The buildings are: *Una Vida*, *Penasco Blanco*, *Pueblo Bonito*, *Hungo Pavi*, *Chetro Ketl*, *Pueblo Alto*, *Pueblo Arroyo*, *Wiji*, *Tsin Kletzin*, *Kin Kletso*, *Casa Chiquita* and *New Alto*. Most of them contain solar and lunar cosmology in three separate articulations: their orientations, internal geometry, and geographic interrelationships developed in relationship to the cycles of the Sun and Moon. [SOFAER 2007: 225]

changed the way of masonry styles (there are six major styles that can be recognized and all of equally effective capabilities and bearing characteristics) using tabular sandstone blocks. In vicinity of *Pueblo Bonito* there is a great *Kiva* – called *Casa Rinconada*, which served as a center for the local community. The interior include an encircling bench (like on Fig. 7), a raised masonry fireplace and four masonry-lined seating holes for the bases of roof-support columns. Sun observation can be discovered here too: early sunlight on summer solstice day would enter through one of the above-ground windows and mark a certain spot on the opposite wall. The most technically advanced point of the Chacoan culture was their road system and line-of-sight communication network which consisted of spots on distances which allowed visual recognition of fire at night! These roads had linked Puebloan communities throughout the Chaco basin, with a focus upon Chaco Canyon. Up today, there are six major roads discovered, totaling over 400 miles (but what obviously was not the final length). When the road reached the cliffs of the mesa, they built a stairway on the vertical wall surface! Beside roads, the Chacoans are well known for their water management, which enabled them to provide food for such a large community, while the surplus was exchanged for other goods. The Chaco Canyon was abandoned around 1250.

MAJOR ELEMENTS OF PUEBLOAN SETTLEMENTS IDENTITY

GLAVNA OBILJEŽJA PUEBLO NASELJA

As a conclusion to this tiny, tiny top of a huge research iceberg called *Search for the Meaning of Prehistoric Settlements of the American Southwest* the author of this paper have tried to unfold the data already known to the scientific community but present them through another view, a view of an architect – planner and discuss their appearance and position in the global settlement history. The author, neither had the intention to go deep into the historic data, nor have the needed space and Time of the reader to reveal all the knowledge he gained during his research upon this topic. But, never the less, there are several highlights that have characterized this part of the US and a portion of Time when these ancestors roamed that part of the Earth. These highlights undoubtedly prove that cultures that have inhabited the described region were not savages, but to the contrary, highly sophisticated and intelligent members of the Human kind that, regardless having no written and calculus skills, have proved of their knowledge in observing the environment and making conclusions that helped them in surviving and taking portion

of known Space and Time. Observing the Sky above they managed to perceptualize the omnipresent celestial changes and repeatedness in day and night stellar appearances over a longer period of time: creating Solar and Lunar calendars. In designing the settlement layout, cardinal directions of outside walls were of crucial importance. Some structures were built in a way to help in understanding and predicting the change (flow) of Time, by watching the constant reappearance of Sky objects. Every single settlement had something that would help in retrieving the Time: a window, a doorway, a portion of the wall which shadow would fall and cover a certain point at a certain Time. Some of the architectural and planning details and rules are still in use in contemporary pueblos occupied by the descendants of the Ancient puebloans. Although we do not have any physical proof and relict that could explain their language or music of these culture, the pieces discovered through the archeological and anthropological researches undoubtedly confirm their high level of thinking and concluding in their everyday life. The engineering techniques used in erecting their settlements and structures are unique. The development of the residential buildings – from the pithouses to multi-story pueblo structures; settlement site selection – from river valleys to high rise and hardly accessible alcoves bellow the mesa rims; farming land in such arid environment that forced them to invent the check dam and watering system; construction of public buildings (*Kivas*) or arranging of public spaces (sometimes even both) and other structures which purpose is still unclear; and finally cultural habits and beliefs when speaking of life and death. All these *beads and bites* that have been discovered, and so many others that wait to be discovered, are more than a proof that History of City Making had not only been written in Europe and Asia, but

[Proofread by: ANDREA JANDRIČEK]

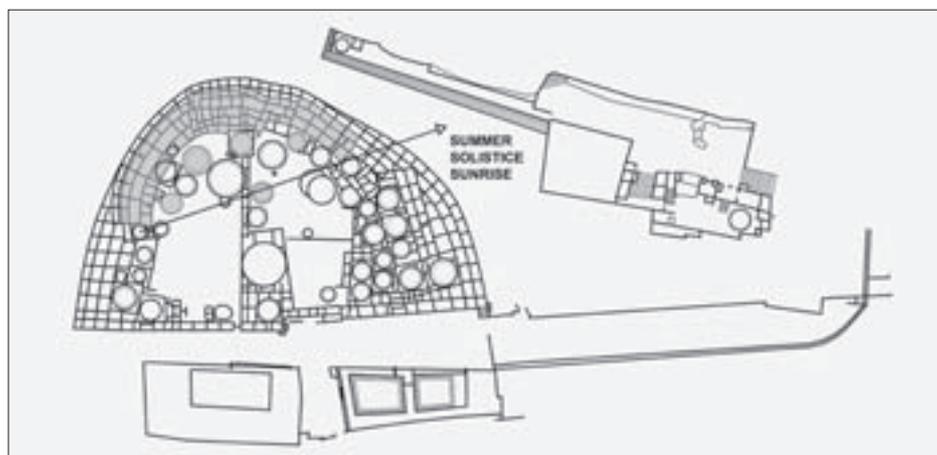


FIG. 29 PUEBLO BONITO SEEN FROM ABOVE THE MESA NEARBY

SL. 29. POGLED NA PUEBLO BONITO S RUBA SUSJEDNE STIJE NE

FIG. 30 CHACO CANYON: PUEBLO BONITO AND SUN ALIGNMENTS

SL. 30. CHACO CANYON: PUEBLO BONITO I PRVA PORAVNANJA ZGRADA S IZLASKOM SUNCA



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INTERNET SOURCES

INTERNETSKI IZVORI

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ILLUSTRATION SOURCES

IZVORI ILUSTRACIJA

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SUMMARY

SAŽETAK

POČETAK NASTANKA PRAPOVIJESNIH NASELJA AMERIČKOG JUGOZAPADA

Jugozapadni dio sjevernoameričkog kontinenta (poznat u stručnoj literaturi kao *Southwest* i koji pokriva područje četiri savezne države: Arizona, Novi Meksiko, Kolorado i Nevada) predstavlja kolijevku brojnih kultura koje su nositelji obilježja nastanka prvih naselja na tlu Amerike. Najpoznatije su kulture – koje stvaraju prve oblike naselja – Hohokams, Mogollon, Anasazi, Salado i Sinaqua, dok su još dvije vrijedne spomena iako njihova naselja ne predstavljaju posebno značajnu stepenicu u povijesti naselja: Fremont i Patayan kultura. Zajedničko obilježje svih ovih kultura jest da su, za razliku od kultura na jugoistoku, koje su naseljavale prostor velikim dijelom pod šumom s obiljem vodotoka i rahlom i vlažnom zemljom, živjele u najsušnijem dijelu Amerike, s vrlo velikim izmjenama temperature tijekom dana, mjeseci i godine, s vrlo malo padalina i rijeka, skoro bez sume a s neograničenim količinama pješčanika. Upravo to je i razlog pojavi drugačijih promišljanja u izgradnji prvih nastambi i naselja – zemunice (prirodne i djelomično modelirane rupe u zemlji) za koje je trebalo samo napraviti krov. Vrlo oštra klima, smanjen broj velike divljači, natjeralo je te stanovnike na promišljanje kako zadržati vodu i njome navodnjavati zemlju koju su započeli obrađivati. Upravo je Hohokam kultura zacetak izgradnje velikih sustava kanala kojima se voda dovodila do poljoprivrednih površina. Ovakav razvoj poljoprivrede uvjetovao je i izgradnju stalnih nastambi i naselja. Osim niza zemunica, na prijelazu u drugo tisućljeće, ova kultura započinje s gradnjom prvih struktura na terenu. Najpoznatija takva struktura je *Casa Grande*, lokalitet na kojem se osim ove četverokatne

građevine, nalaze i brojni tragovi pueblo građevina te poluukopanih sportskih igralista za koje se smatra da predstavljaju prvi pravi dokaz o trgovačkoj povezanosti ovih naroda i kultura sa srednjom Amerikom i civilizacijom Maya. Najpoznatiji lokalitet Mogollon kulture je *Gila Cliff Dwelling* na kojem se uočava isprepletanje znanja ove kulture sa znanjem preuzetim od daleko najbrojnije kulture – Anasazi i njihovog novog načina života i stvaranja naselja – izgradnja zgrada unutar prirodnih udubljenja pri vrhu okomitih stijena pješčanika (*mesas*). Anasazi su nastanjivali veliko područje na kojem se mogu pronaći brojni oblici njihovih naselja koji su i do dan-danas vrlo dobro sačuvani zahvaljujući Odredbama i Zakonima kojima je velik broj ovih područja zaštićen kao povijesni lokalitet od nacionalnog i svjetskog značaja te *National Park Service* koji se brine o njihovom održavanju, zaštiti i prezentaciji posjetiteljima. Najpoznatija naselja Anasazi kulture su ona u nacionalnom parku Mesa Verde na jugoistoku države Kolorado – poznate cliff dwellings (*Cliff Palace*, *Spruce Tree House*, *Balcony House*), s nadzemnim i ukopanim građevinama čija tehnika građenja umnogome otkriva visoku razinu svijesti i promišljanja ove kulture. Vrlo slične građevne strukture mogu se naći na cijelom području *Four Corners*, a naročito u istočnoj i središnjoj Arizoni. U državi Novi Meksiko, unutar *Chaco Canyon National Historic Park*, nalazi se jedna od najveličanstvenijih građevina-naselja ovog razdoblja – peterokatna struktura D-oblika i veličine približno 160x100 metara izgrađena skoro prije 12 stoljeća u kojoj je u trenutku najveće izgrađenosti živjelo oko 1200 ljudi. Unatoč tome što

nijedna od ovih kultura nije poznavala pismo niti bilo koji oblik računskih operacija, osim brojnih petroglifa i piktograma ostavljenih na stijenama ili unutar udubljenja, metode koje su koristili u gradnji svojih podzemnih i stambenih struktura i naselja iskazuju visok stupanj tehničkog i astronomskog znanja. Osnovno obilježje pueblo naselja je nepostojanje ulica već samo velikih javnih površina (trgova), koji su zasigurno korišteni za okupljanja prilikom raznih vjerskih ceremonija ili razmjene roba sa susjednim kulturama. Građevine su bile gusto zbijene, odnosno građene jedna do druge omogućavajući prilaz do njih isključivo preko krova i otvora u stropu. Zahvaljujući još nezagadenom okolišu, mogli su promatranjem zapaziti određene promjene na noćnom i dnevnom nebu, uočiti određene stalne mijene i stvoriti prvi kalendar koji im je pomagao kod poljoprivrednih radova – najvažnijeg uvjeta opstanka u pustinjskom kraju. Osim promatranja zvijezda, Sunca i Mjeseca, ove kulture poznate su po izgradnji brojnih kanala za navodnjavanje kao i manjih akumulacijskih jezera čiju su vodu kasnije koristili za navodnjavanje; vrlo razvijenoj trgovini koja je katkad dosežala i više od 1000 km udaljenosti od njihovog izvornog lokaliteta. Za tu trgovinu nuždan je bio sustav putova i snalazenja u prostoru, za što nam je najbolji primjer Chaco kulture i njihov sustav prometnica i označavanja za kretanje noću. Jedna po jedna od ovih kultura su nestale prije dolaska Europljana u ove krajeve – kako zbog bolesti, nagle promjene klime ili zbog ratnih sukoba. Jedan manji dio se stopio s drugim subkulturama čiji potomci i danas žive na ovim prostorima.

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. His postdoctoral research in 2003 (Fulbright grant) and 2006/7 upon the topic: History of Making American Cities has been performed at the same College. During his numerous UC Berkeley visits he had had lectures and conducted three regular academic courses.

Prof. dr.sc. **NENAD LIPOVAC** zaposlen je kao izvanredni profesor na Arhitektonskom fakultetu Sveučilišta u Zagrebu. Magistrirao je 1994., a doktorirao 2001. godine na maticnom fakultetu provodeći većinu svog istraživanja na *College of Environmental Design*, UC Berkeley. Na istom fakultetu, kao stipendist Fulbrightove fondacije, 2003. godine provodi 10 mjeseci postdoktorskog istraživanja – *Povijest nastanka američkog grada*, te ponovno 2006/7. Tijekom tih boravaka održao je brojna redovna i pozvana predavanja.

