

## **Caves, Cacti and Cucurbits: Realities of the Management of Protected Areas**

**Antonio Martínez Tuñón**, Deputy Field Archeologist, INAH-Centro Regional Oaxaca,  
Pino Suarez 715, Oaxaca, Oaxaca, 68000 Mexico

### **Abstract (Español; English)**

Acuerdos internacionales y marcos legales nacionales definen los límites de la gestión del patrimonio, pero funcionarios tienen que trabajar de manera cotidiana en relación a las realidades sociales y del medioambiente del sitio. En el caso del corredor Mitla-Yagul en Oaxaca esto quiere decir la protección de restos frágiles de diez mil años de habitación humana en más de cuarenta cuevas, atender a paisajes botánicos delicados bajo mucha presión de usuarios humanos, y avanzando con la investigación científica que nos permite entender mejor el recurso que intentamos proteger. Al mismo tiempo otros intereses quieren aprovechar del mismo corredor como ruta de construcción de caminos, para pastoreo, y para desarrollo turístico extensivo. Y comunidades locales tienen intereses pragmáticos tanto como simbólicos. ¿Como podemos atender a todos estos intereses sin perder la vista de las consideraciones nacionales y internacionales?

International agreements and national legal frameworks define the outer boundaries of heritage management, but practitioners must function on a day-to-day basis in relation to the environmental and social realities of the site. In the case of the Mitla-Yagul corridor in Oaxaca this means the protection of fragile remains from ten thousand years of human habitation in more than forty caves, dealing with delicate botanical landscapes under heavy pressure from human users, and moving forward with scientific research which better our understanding of what we seek to protect. Yet other stakeholders prize the corridor for road construction, grazing, and extensive tourism development. And local communities have both symbolic and pragmatic interests. How do we manage these without losing sight of those national and international considerations?

### **The prehistoric caves of Yagul and Mitla**

The prehistoric caves of Yagul and Mitla contain the earliest evidence of the domestication of plants and the beginning of incipient agriculture in North America which represents the first step in the conformation of the high civilizations that would develop in this area. The archeological evidence that has been located goes back to the end of the Pleistocene (10,000 B.C., identified in level E of Cueva Blanca [White Cave]) and shows the continuous process that leads to the establishment of sedentary farming societies.

The site is located in southeastern Mexico in the highlands of the State of Oaxaca (specifically in the sub-valley of Tlacolula, part of the Valles Centrales [Central Valleys]), where continuous archeological research has shown the development of a long cultural tradition, with sites such as Mitla, Yagul, Lamytieco, Dainzú, and above all, Monte Albán.

The site is defined by the concentration of the principal elements that shape the virtues of the site: the continuity of the cultural landscape, the caves and shelters that mark the tran-

sition from nomadism to sedentarism, the principal sites with cave paintings and the development of agriculture from prehistory to today. The site is composed principally of three parts: in the far west, the Monumental Archeological Zone of the Yagul is found; to the southeast of this site, Caballito Blanco (Little White Horse) is found, which contains three well-defined pre-Hispanic buildings with vertical stone walls, as well as a great quantity of caves, many of them with evidence of occupation and cave paintings; the zone of prehistoric caves occupies principally the east part of this site, these are located on an ample mesa (plateau) that ranges in elevation from two to three hundred meters above the floor of the valley, with long cliffs along the north part of the mesa formed by the volcanic tuff that shapes the area—the greater part of the shelters and caves are located here, among them are the ones investigated, from which we obtained what knowledge we have about the local incipient agricultural development.

It is in this place that the “Prehistoric Caves of Yagul and Mitla” project is being created as a protected area, which is being developed through an effort of construction, and management of a cultural landscape. The landscape here is understood not as a territory, but rather as the cultural value that the societies give to a territory. It is a point of meeting where in a portion of space a series of social values of different types intercalate, generating behaviors, which in some cases are incompatible among themselves.

Landscapes are diachronic spaces in which human activity goes along, leaving its footprint. The social modifications in the environment are evidence of the distinct values that have been given to determined spaces over time, but to be truly integrated into the landscape, the social modifications necessarily have to be consciously acknowledged by the actors involved in said landscape. It is because of this that the first step in the attempt at constructing this landscape is the identification of the values that are implicated in it, as well as the territorial characteristics that are its foundation.

The physical characteristics of the environment are those that constitute the foundation of our landscape. The area originated in the Quaternary period and is of igneous (volcanic) origin, whose greater part is of pyroclastic origin (was formed principally by volcanic ash), even though other types of igneous rocks are found at the site. The area comprises a microbasin that originates in the Sierra Juárez (Juárez Mountain Range) and discharges into the Mitla River. The vegetation comprises principally “low deciduous jungle”—this means that the vegetation loses its foliage during the dry season and presents great exuberance during the rains. As far as local fauna, it is conserved, thanks to the fact that the vegetation itself is well conserved. Among the principal species are lizards and other reptiles, and different types of birds, such as the hummingbird, sparrow, falcon, and bearded vulture, among others. Mammals of the region are in general crepuscular or nocturnal, and therefore are not easily sighted, but their presence is made known by their tracks and scat; most notably among these are the ring-tail, fox, skunk, opossum, rabbit, and field mouse.

In this territory, a series of values are formed. By “values,” we mean a series of virtues that the distinct social actors find in the space in which they develop; these values exhibit a diversity of distinct forms that are not necessarily compatible among themselves, generating contradictions that shape the landscape over time. For the purposes of this work, three principal aspects have been identified: the economic, the identity-giving, and the scientific, with

their distinct components, which shape the values of the area of the prehistoric caves of Yagul and Mitla.

In terms of the landscape, the economy can be seen starting equally from the interactions between nature and society, expressed principally in interchanges of material and energy, with which it is possible for us to distinguish three types of environments. The first is the natural environment, in which the work process does not seriously alter or negatively impact the ecosystems as do hunting, fishing, and harvesting. The second type is when the environment is negatively impacted by the introduction of an ecological artifice, formed by previously domesticated species, or those in the process of being domesticated, such as in agriculture, animal husbandry, etc., as well as production-related modifications to the soil, involving the landscape. In these cases the environment depends on the continuation of human work, since if it is abandoned, it will be recovered by the original local (native) populations. Therefore, we can consider three types of environments: the natural environment, which man exploits directly, the transformed environment, that man exploits in a mediated form and which already constitutes a landscape, and the social environment, in which men exchange the products of their work.

The majority of the site, in which evidence of prehistoric occupation is concentrated, is made up of land too rocky for agricultural use, where we can observe the natural environment in the terms that have been expressed. These areas are used for gathering diverse species that are found in their wild state, as well as hunting (principally small mammals), through which we can observe a continuity in its uses from prehistoric times through the present.

In contrast, in the lower parts of the site, almost at the level of the valley, more fertile lands are found in the western part surrounding Yagul and Caballito Blanco, and in the eastern part surrounding the Mitla fortress. On these lands corn, beans, alfalfa, and marigolds (the traditional flower for the festivities for The Day of the Dead) are grown, among others. In dealing with lands that have traditionally been used for cultivation, it is not surprising that the principal economic value given by the population should be agricultural production.

Another area used for agriculture and animal husbandry is the upper part of the Caballito Blanco mesa, where cultivation of agave “*espadín*,” used for mezcal production, is carried out. This crop differs from those above in that its growth is much more prolonged, taking between eight and nine years to yield harvest, which results in less disturbance of the sediments, thereby conserving archeological evidence that may exist in the area.

Some spots in the area of Los Compadres are used for grazing livestock, which, though not massive, has indeed resulted in modifying the conditions where the plant species exhibit a greater dispersion in comparison with the eastern section, where the minimal presence of livestock has resulted in the land being recovered by native plant species.

Recently, the economic value of the area, originally based on its agricultural productivity, has been modified by realty speculation, and the lands that correspond to the southwestern part of the polygon have become indentified as those most threatened by urban expansion. In the Tres Piedras Colony and the Duvil-Yasip spot, there have necessarily been constant inspections and work stoppages, to contain the urban growth of Tlacolula to the inte-

rior of the polygon. Likewise, the south part of the polygon, which is affected by the Pan-American Highway, is a focus of attention in protection efforts, due to the particular vulnerability that this roadway creates.

Transcending the economic values, which even if they are the immediate ones are not the only ones, we can also identify certain identity values in the landscape. The values of identity refer to the emotional links of the society to objects and specific sites. They can be traditional or commemorative, or have spiritual and religious ties, as well as patriotic-nationalistic ones (Feilden and Jokilehto 1998, 28). Peoples tend to create symbolic relationships with the spaces they inhabit; it is the relationship between country and nation—"country" as geographic space and "nation" as a feeling of community.

The indigenous peoples of Mexico have created ancestral ties with the territory that they occupy, designating some places over time as profane, and others as sacred. In this sense, the caves are an element of great relevance in the indigenous cosmology, an element strongly associated with the infraworld and its deities. Such is the case of the Cueva del Diablo (Devil's Cave), located to the east of Mitla, where even today diverse rituals of pre-Hispanic origin are performed, such as "cleanings" (*limpias*) and "petitions" (*pedimentos*).

The lands on which the prehistoric caves of Yagul and Mitla are found have also been shaped by indigenous, traditional community relationships in contemporary times, such as is the case of the Unión Zapata ejido (ejidos are areas of commonly held/worked land given to groups of peasants at the conclusion of the Mexican Revolution), which was created from the agrarian distribution of the 1930s. This historical period for Mexico is characterized by agrarian redistribution as one of the promised objectives of the Mexican Revolution, which modified in diverse scope the relationships between the land and those who work it. Subsequently, inhabitants of different communities, such as Mitla, Díaz Ordaz, and Santa Catarina Albarradas came to settle in Loma Larga, "all those who united to create the Unión Zapata ejido shared the experience of lacking land; the majority were extremely poor people who worked like peons on the different surrounding *haciendas*" (Stephen 2002, 270; in Mexico a hacienda encompasses the land as well as the compound—it is essentially equivalent to a plantation). This resulted in the lands becoming the integration and cohesion element of this community, which represents another important identity-giving element of our landscape.

A third group of values is made up of what we have called scientific values. They are recognized, starting from specialized studies in different branches of knowledge, and through them the importance of the property is identified in relation to its own time, or in reference to the present which, in the case of the prehistoric caves of Yagula and Mitla, is of both a natural and cultural nature.

The botanical wealth of the area was registered by Enrique Martínez y Ojeda (1996), who created an illustrated guide of the plants of Yagul, among which he distinguished that at least 90% of these have some use for man, be it as food, raw material for the manufacture of textiles, soaps, or many others. This study was conducted in only a fraction of the area, thus new works could augment the catalog of plants and our knowledge of the biological wealth of the region. Likewise, a series of studies are planned, with different institutions, of the local fauna for a more complete understanding of local ecological systems. In addition, recent

botanical studies of the area have registered a series of endemic plants that are found only in this area. Therefore, proper management of the natural resources of the site is of the utmost importance.

The area has great biological importance, as the ecosystem that it supports has not suffered drastic changes during the last 10,000 years, conserving the same plant and animal species since the Archaic period (Flannery and Wheeler 1986; Flannery 1986), which represents a significant characteristic given that the greater part of the Central Valleys of Oaxaca, except perhaps in this small area, the native vegetation has been strongly altered by thousands of years of agricultural practices.

Nevertheless the principal academic value of the site is the one identified in the research by Flannery in the 1960s, with which he managed to document the earliest evidence of human presence in the area, around 12,000 years ago, as well as the process by which incipient agriculture developed.

Without doubt, the principal archeological value of the area is having been identified as one of the points where the area's incipient agriculture developed, thanks to the excavations conducted in the rock shelter of Guilá Naquitz, where the dry conditions of the interior allowed recovery of the earliest evidence of a series of plants in the process of domestication, most notably among these the *jícara* (a member of the gourd family, which is commonly hollowed out and used as a bowl or cup, sometimes ornately decorated), squash (*Cucurbita pepo*), beans, and corn.

The corn found in the rock shelter of Guilá Naquitz, thanks to recent studies with an accelerator mass spectrometer (AMS), turned out to be 730 years older than those located by McNeish in the Valley of Tehuacan (Benz 2001). This means that as of today, it is the oldest recovered in the world.

Nevertheless, the archeological wealth of the area is not restricted to this highly important event, but rather it also contains significant evidence of the different technologies developed in prehistoric times. Most notable are those of the lithic (stone/masonry) industry, as much during the prehistoric era with the development of stone tools such as arrowheads, as in the Postclassic Mesoamerican, during which very elaborate, monumental architectural structures were constructed, whose most outstanding example in the area is the archeological zone of Mitla, with its stone mosaics and monolithic lintels, the quarry of one of which is found in the area of the prehistoric caves.

Another archeological aspect of the area is the presence of distinct manifestations of cave paintings. In a great quantity of caves and rock shelters, small vestiges of paintings have been found, usually in the color red; the majority of these are abstract designs, principally composed of a series of dots or lines. Likewise, it is also possible to find anthropomorphic and zoomorphic designs which, due to their characteristics, could correspond to early phases of this practice. However, the most relevant examples of cave paintings appear to correspond to later phases, due to the characteristics they present. In the "Cave of the Machines," which is the component with the greatest quantity of cave paintings, the designs appear to correspond to the Postclassic period, in particular the representation of Yahui, a mythological figure related to the caves, amply represented in the Mixtec codices (manuscripts) of this period.

Likewise, the most representative example of stone engraving, located in the Caballito Blanco area, consists of a floor that contains an impressive quantity of petroglyphs, as well as a sculptural representation that appears to correspond to the bat god.

The great complexity that the carvings present, and their association with the archeological zone, gives us an indication that they originate from the epoch of Yagul's splendor during the Postclassic period, even though a complete study and registry of them is necessary, which presents a series of difficulties, given the physical characteristics of the element. Nonetheless, it is considered of vital importance for the understanding of the complicated Zapotec writing system, of which these carvings represent an incomparable example.

Based on all these particular characteristics of the site, the strategies for its management are posed, for the sake of reconciling all these recognized values. The first relevant aspect is the fragility that the site presents, as much in its natural as in its archeological aspects. It is because of this that if it were opened to tourists, it must be carefully planned, always in controlled groups, based on the carrying capacity of the place, and with site committee members to safeguard the different elements the site is composed of.

A fundamental aspect of management planning is the active participation of the communities involved, and by this means it is hoped that the identity-giving aspect of the site will be strengthened, just as it will be considered to be the best means to ensure their protection, since the onus of safeguarding the site is principally on the inhabitants. This, of course, with support and training from competent institutions.

Upon identifying the site's greatest risk factor as the change in soil uses due to urban expansion, and at the same time, agricultural development being of fundamental value, one of the means of protection has to be the promotion of agricultural activities for the sake of maintaining this economic value, this in order to contain the changes that threaten this site.

## References

- Barabas, A.M., M. Winter, M. del Carmen Castillo, and N. Moreno. 2005 *La Cueva del Diablo: Creencias y Rituales de ayer y de hoy entre los Zapotecos de Mitla, Oaxaca*. Mexico: CONACULTA/INAH.
- Benz, B.F. 2001. Archaeological evidence of teosinte domestication from Guila Naquitz, Oaxaca. *Proceedings of the National Academy of Sciences* 98:4, 2104–2106.
- Feilden, B., and J. Jokilehto. 1998. *Management Guidelines for World Cultural Heritage Sites*. 2nd ed. Rome: International Centre for the Study of Preservation and Restoration of Cultural Property.
- Flannery, K., ed. 1986. *Guila Naquitz: Archaic Foraging and Early Agriculture in Oaxaca*. Orlando: Academic Press.
- Flannery, K., and J.C. Wheeler. 1986. Animal food remains from Preceramic Guila Naquitz. In *Guila Naquitz: Archaic Foraging and Early Agriculture in Oaxaca*, ed. K. Flannery. Orlando: Academic Press, 157–162.
- Martinez y Ojeda, E. 1996. Guía ilustrada de las plantas de Yagul. Proyecto Yagul. 96: Conservacion de los recursos ecologicos. Oaxaca: Centro INAH.
- Robles, N. 1994. *Las Canteras de Mitla: Tecnología para la Arquitectura Monumental*. Vanderbilt University Publications in Anthropology no. 47. Nashville: Vanderbilt University.

Stephen, L. 2002. *Zapata Lives! Histories and Cultural Politics from Southern Mexico*.  
Berkeley: University of California Press.