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ARCHAEOASTRONOMY AT COPAN: AN APPRAISAL

Se critica la hipótesis según la cual los Mayas de Copan usaban una línea astronómica, definida por las estelas 12, 10, y el sol poniente. El uso de la "ventana" del Templo 22 para observaciones astronómicas tampoco es probable, considerando la historia arquitectónica del lugar.

When J. E. Thompson wrote: "Maya astronomy is too important to be left to the astronomers" (1974: 97), he was not joking about the astronomers' seriousness; he was, instead, reminding his fellow archaeologists that since Maya astronomy is part of Maya culture, it is a matter of study to mayanists. The new science of archaeoastronomy calls for the joint efforts of both archaeologists and astronomers, and a two-way dialogue is required for a fruitful collaboration. The former need the help of astronomers when seeking information on the movements of celestial bodies visible at the time and location of the people they study. Whenever the anthropologist believes a feature to be astronomical in origin, he must submit his hypothesis to the astronomer. Similarly, whenever, at a given site, the latter observes a line of sight or a building's orientation with possible astronomical significance, he must check with the archaeologist to be sure his interpretation does not contradict the archaeological evidence, and whether it has or could have a cultural significance. In other words, does astronomy provide the only and best explanation to a certain feature or are there other alternatives to be considered?

More often than not, archaeologists don't follow Thompson's advice and they leave Maya astronomy in the hands of the astronomers. Such an uncritical attitude, which may reflect a complex of inferiority with regard to "hard" science, allows very weak hypotheses to become "established facts" in the literature.

The purpose of this paper¹ is to review the two best known and most widely accepted astronomical interpretations at the ruins of Copan, Honduras:

1. The use of a line of sight from Stela 12 to Stela 10 to observe the setting sun.
2. The use of a narrow window in Temple 22 for astronomical sightings, more precisely for observing the movements of Venus.

THE STELAE 12-10 BASELINE

It seems that Spinden – in a chart where he briefly describes the Copan monuments – was the first to assume that a relationship existed between Stelae 12 and 10: "These two stelae are correlated in an east and west line passing over Copan. They are set up on hills on opposite sides of the valley ..." (1913: 164, Table I). 12 and 10 belong to a group of five stelae (with 2, 13 and 23) with the same Dedicatory Date 9.11.0.0.0; to these may be added Stelae 19 and 3 which were inaugurated respectively 5 and 15 uinals before the period ending. Stela 19 is located 5.7 km west-north-west of the Main Group, while 10 is 4.7 km west of it (figure 1). Stela 12 is 1.9 km to the east of the Main Group, and 13.4 km to the north-east; the exact provenience of 23 is unknown, but it probably came from the far north-eastern side of the valley, since its fragments were seen first by Maudslay (1889-1902, vol. V: 16), then by Morley (1920), at Santa Rita. Stelae 2 and 3 – the only two of the group to be carved with human figures – are in the Great Plaza; the former had been re-located on top of the much later Structure 10L-10 and its original location is unknown; Stela 3, which stands alone in the Main Plaza, may be another displaced monument. Thus, at least five stelae were erected at approximately the same time (652 AD) at both eastern and western ends of the valley where most of the Copan population lived (figure 1). It has been suggested that these monuments were set up by the king Smoke-Jaguar as markers of the limits of Copan. Recent surveys tend to confirm this hypothesis (Baudez (Ed.) 1983, vol. III: maps 25, 26).

Given this setting, the "correlation" between Stelae 10 and 12 appears as an arbitrary construction by Spinden. Why not correlate other monuments of the group with another "line"? If from any point in the eastern

part of the valley one sights another point to the west, one will always see the sun setting behind it, twice a year; but that does not demonstrate or even indicate that the Maya used these two stelae for defining a line of sight for either ritual or practical purposes. Furthermore, had the Maya wanted to draw a sight line across the valley, they would – to ensure some degree of precision – have erected Stela 10 on the horizon and not where it stands, that is well below it.

Morley (1920, 1925; also: Gann 1926) took up Spinden's hypothesis, expanding it and making an actual sighting. He showed that viewed from Stela 12, the sun sets high above, and not behind, Stela 10, on both April 12 and September 1. He did not offer an interpretation for the last date, but proposed that April 12 signalled the beginning of milpa planting or the official start of the rainy season. One familiar with the climate of Copan would find the date a bit too early as the first rains usually fall at the end of the month. Be that as it may, Morley was at pains with his experiment because on April 12, the smoke from the burning milpas was such that Stela 10 could not be seen from Stela 12; Morley had to light a bonfire behind the first to sight it. Should we assume that the Classic Maya were doing the same? Or that the burning of their fields took place earlier or later than today? As for the September 1 date, it falls in a very rainy period and I doubt if sunset was ever observable at that time of the year. Morley also noticed that the Stelae 10-12 baseline runs very close to and approximately along the southern limit of the Acropolis. Years later, Aveni and Hartung (1976) stated that the baseline *approximately* (underlining provided) corresponded to the orientation of the Acropolis buildings. The former is 9° while the orientation of the buildings varies from 5 to 9°. When one considers the level of astronomical precision reached by Maya astronomers (for the calculation of the Venus cycle for instance), one may wonder at the usefulness of an "approximate" baseline.

According to Merrill (1945) the baseline signalled the sunsets that occur at approximately midway in time (and not half the angle as one would have rather expected) between the equinox and the solar zenith passage.

To sum up, the 12-10 baseline hypothesis does not deserve much credit for the following reasons:

1. The dates signalled by the assumed sighting do not appear as very significant.
2. Besides being imprecise, sightings taken at sunset would have been very difficult or even impossible, due to the burning of milpas in April and to cloudy skies in September.
3. The alternate explanation for the location of Stelae 12 and 10, i. e. that they are members of a group of five outlying monuments marking the limits of the Copan polity, is much more convincing.

According to Aveni and others (Aveni and Hartung 1976; Aveni 1977, 1980; Closs, Aveni and Crowley 1984), the narrow window or slit in the western wall of Structure 10L-22 was used for astronomical sightings. First, "the mid-line of the window faces the sunset position on precisely the same dates determined for the Stela 12-10 base line" (Aveni 1980: 245). Second, the window was used to observe the "great northern extremes of Venus which occur at the same time as the traditional period associated to the beginning of the rainy season" (Closs, Aveni and Crowley 1984).

Aveni and Hartung (1976: 10) are mistaken when they state that this opening is unique at Copan. In the same building, the northern wall of the western room probably had a similar window and another opening connected the central back room to the one to the east (Hohmann and Vogrin 1982: Abb. 314). According to Maudslay (1889 - 1902, vol. V: 27), the western wall of Structure 20 (which has since fallen into the river) was pierced by four tall and narrow slits (see the reconstruction by Hohmann and Vogrin, *op. cit.*: Abb. 178); they could not have been of any astronomical use since Structure 11 obstructed the view. In both buildings, the most probable function of these openings was aeration; according to the location of the cord-holders in Structure 22, the east and west rooms had their doors closed by curtains, and the air, without windows, would have rapidly become unbreathable. Formerly there was a passageway instead of the window, symmetrical to the one which goes through the east room's eastern wall (*ibid.*: 50; Abb. 314, 317). When the Maya filled up the west passageway, they left open its upper part, which then became the famous west window.

The sighting from the Structure 22 window had to be reconstructed by Aveni and Hartung (*op. cit.*) since "la densa vegetación en la Acrópolis impide actualmente la vista directa". Before the abandonment and destruction of the city, the direct view from the window was unfortunately obstructed by something else: the upper wall and the roof of Structure 22A which stands less than a meter away from the window (figure 2); today the walls of this ruined building stand far below the window, but they are sufficiently preserved to allow for an exact reconstruction, and there is no doubt that its roof was level with the top of the window (Hohmann and Vogrin 1982: 52).

Either Structure 22A was built before or at the same time as the west window of Structure 22, or it was built later. In the first hypothesis, the window couldn't have ever been used for sighting; on the other hand, if Structure 22A was built later, the window might have served for astro-

nomical observations before the construction of 22A, but was not filled in when it became useless. In any event, we can be confident that Structure 22 was not built for the purpose of sighting westward, since the window was a late addition.

It has been assumed (Triuk 1939: 88) that 22A is later than 22, but this is far from being demonstrated. According to stratigraphic evidence, Structures 22A and 21A lean against the 3.3 m high building-platform of 22; this does not, however, imply that the three buildings had not been erected at the same time. Conversely, they are more probably coeval. In fact one may argue that 22A and 21A were annexes to the central building 22, and that the Maya emphasized the latter's importance by placing it on a tall pedestal, thus raising it high above its outbuildings.

The mere existence of Structure 22A casts serious doubts as to the use of the window for observing the movements of Venus and on the main function of the building as the "temple of Venus". According to Closs *et al.* (1984) the iconography of the structure confirms its dedication to Venus. It is true that the T2 sign (to which some Mayanists give the meaning Venus while others believe it may only mean star) can be seen three times on the sculpture which frames the inner door: twice above the bicephalic monster's knees, and once above the monster's live head. The presence of T2 in this composition does not imply a special relationship of this building to Venus, since T2 is a common attribute of the monster's live head in Maya iconography (see at Copan, "Altar" G1 and the altar of Stela M).

The sculpture on the inner door of Structure 22 reproduces the frame of sky serpents and supernaturals which surrounds the king on the stelae. Let our imagination place the standing ruler on the threshold of the inner room, and we get the picture of a stela with the same iconography. This is the reason why this building must be the place where the king appeared in full majesty before his subjects, be it his residence, his palace or even his temple. Even if we cannot be more specific, we must admit that Structure 22 was very closely related to Rising Sun, the ruler who built and used it. Structure 22A is also a royal building as evidenced by the large mat motifs which decorated its outer walls (Hohmann and Vogrin, *op. cit.*, Abb. 321).

In this paper, I have voiced my skepticism towards archaeoastronomical interpretations at the Maya site of Copan. The two examples presented above should invite us to use caution when dealing with orientations, alignments, sighting windows and the like.

NOTE

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FIGURES

fig. 1: Distribution of the stelae dated 9.11.0.0.0, in the Copan valley.

fig. 2: Plan and section of Structures 22A, 22 and 21A at Copan (after *Die Architektur von Copan (Honduras)* by H. Hohmann and A. Vogrin. Courtesy of the authors and Akademische Druck- und Verlagsanstalt).

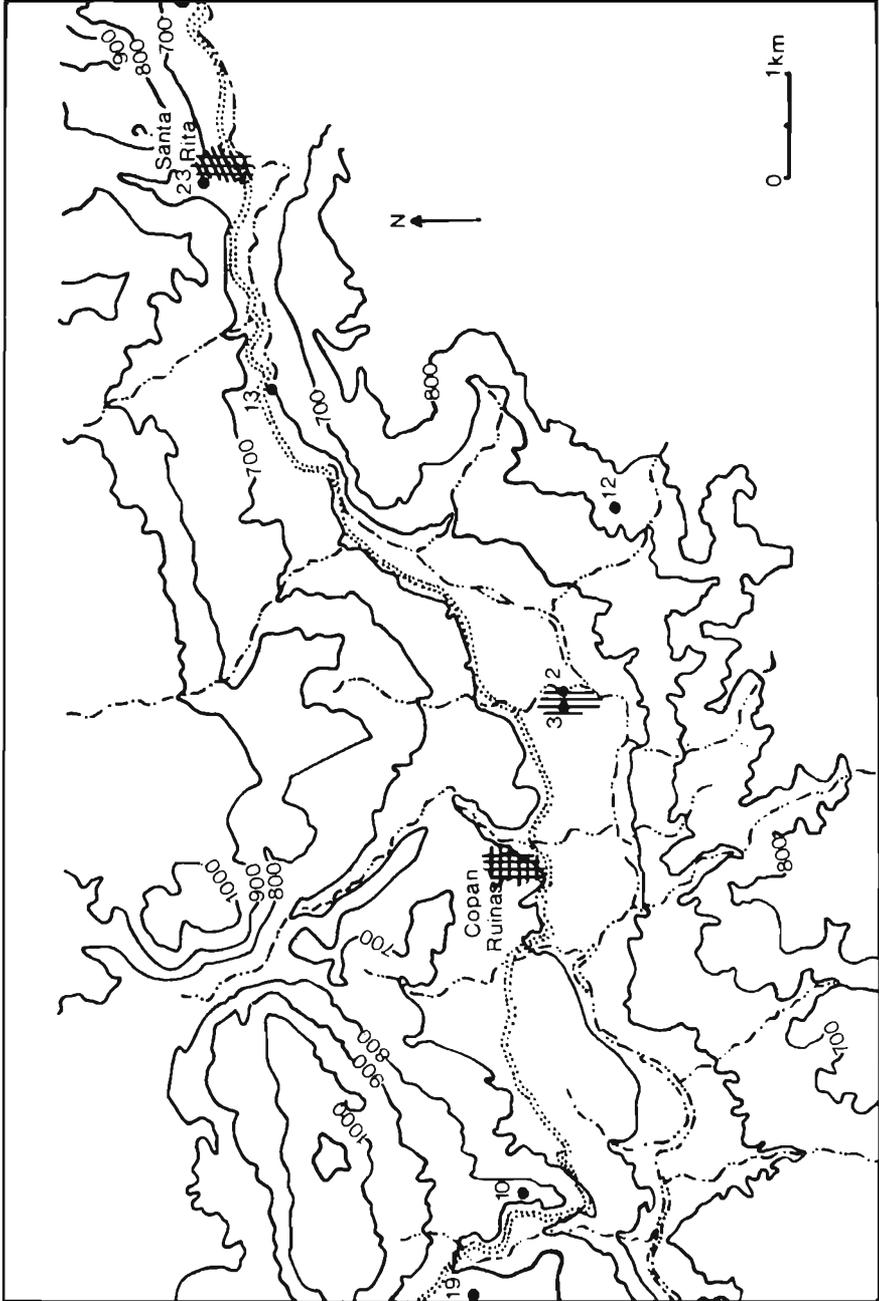


fig. 1

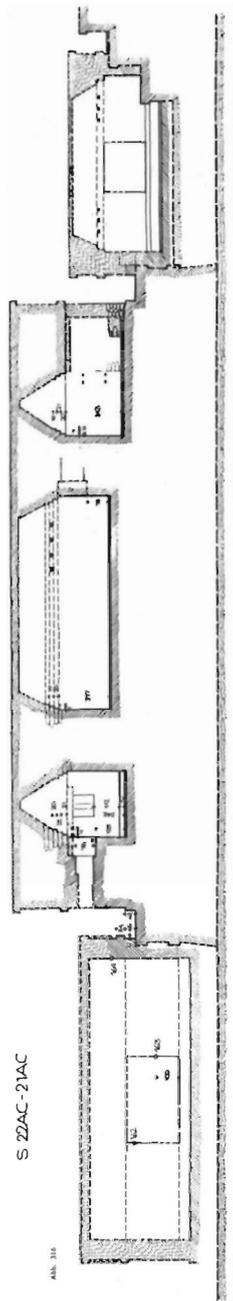
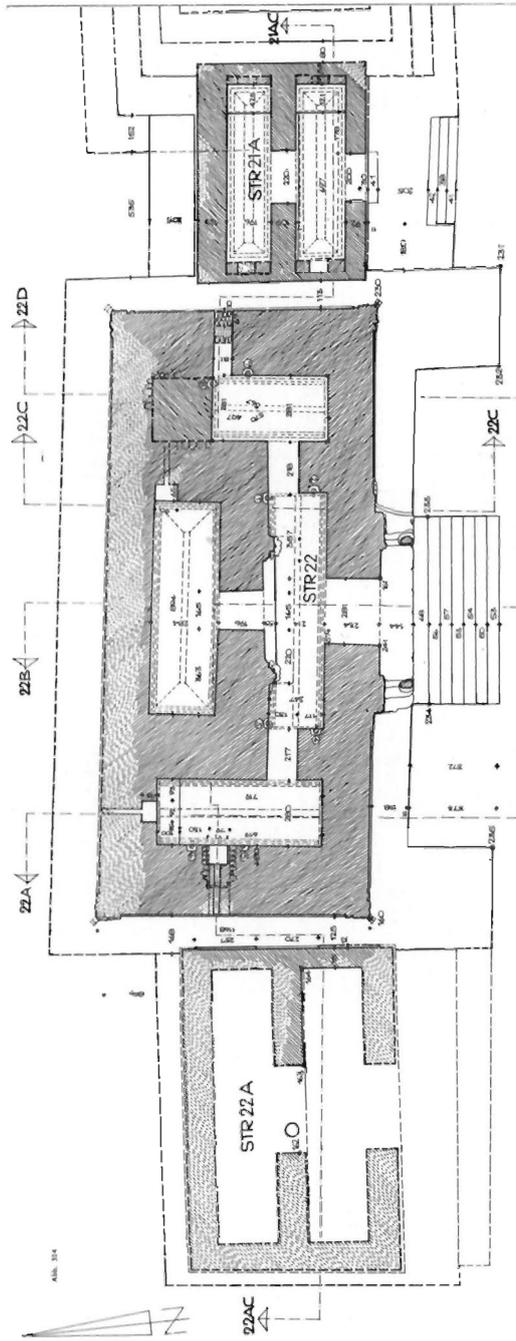


fig. 2

