

## An Appraisal of Baudez' Appraisal of Archaeoastronomy at Copan (and Elsewhere)

La presente argumentación arqueo-astronómica se entiende como la crítica de una crítica, por Claude F. Baudez, de un trabajo anterior de Michael Closs, Anthony F. Aveni y Bruce Crowley. Se discuten las dimensiones astronómico-arquitectónicas de las estructuras 22, 22A (y 20) así como de la línea visual entre las estelas 10 y 12, con respecto a las observaciones de los ciclos de planeta Venus.

Baudez' (1987) appraisal of archaeoastronomy at Copan is an excellent example of scientific reductionism and disciplinary elitism. His criticism reflects neither an understanding of astronomy (knowledge accorded great value by the ancient Maya), nor acquaintance with the literature pertaining to the role of astronomy and calendar in Mesoamerican architecture. We respond specifically to his arguments against the astronomical functions of (a) the line between Stelae 10 and 12 and (b) the west window of Str. 22.

### Stela 10 - 12 Baseline

That Stelae 10 and 12 are members of a group marking the limits of the Copan polity is not in conflict, as Baudez implies (Point 3, page 65) with the hypothesis that the pair served as a solar timing device. The answer to Baudez' question, "Why not correlate other monuments of the group with another line?" is that they do not work. Viewed from either Stelae 10 or 12, Stelae 2, 3, etc. lie low on the valley floor, and Stelae 13, 19, and 23 are invisible. From Stelae 13, 19, and 23 no other stelae are visible. Thus, of all the stelae around the valley, only 10 and 12 are *intervisible*. Furthermore, only 10 and 12 align with a set of solar dates that correlate with a type of calendar known to be present in the Maya inscriptions (the line serves to divide the year into 260/105 day intervals via a base marked by an interval of 20 days from solar zenith passage (Aveni 1977, Fig. 1.5).

These dates are significant (cf. Baudez, Points 1 and 2, page 65) in an agricultural context. The observations of sunset on the baseline in April 2 antici-

pates the rainy season (Closs et.al. 1984: 238) and it allows time for the preparation of the attending ritual. No one, including the present authors, ever has suggested that this was "precise astronomy". Baudez' assumption that one cannot observe the September event is not based on his personal knowledge but rather upon the untenable assumption of perpetual cloudiness during that time of the year. In fact, general cloudy conditions only would support the notion that one might have reason to set up an anticipatory set of observations well in advance of the actual time of celebration of the event. (We have argued such a case in the Inka capital of Cuzco; see Aveni 1982.)

Two statements by Baudez ought not go unnoticed if only for their ethnocentric posture. He tells us (a) that if the Maya wanted to draw a sight line across the valley, "they would [...] have erected Stela 10 on the horizon and not where it stands" (actually it lies  $\frac{1}{2}^\circ$ , or one sun disk, below the skyline; however, see our discussion of the horizon problem in the next section), and (b) if 10-12 were a baseline, we would expect it to mark sunsets mid-way in space, rather than mid-way in time, between the equinox and zenith passage. The first statement requires the Maya to behave like us (or at least like Baudez); the second demands that they must act like Greeks as well.

All of the special coincidences cited above, in addition to the fact that the 10-12 baseline possesses the same orientation as the Southern Acropolis, over the southern edge of which it passes, render the astronomical hypothesis a logical and concrete mechanism for Smoke Jaguar to enjoin his political subdivisions to the main site. Here, one is reminded of the way the ceque system of Cuzco utilized astronomical alignments in a bureaucratic scheme of socio-political organization (Aveni 1982).

Finally, Tear-Haynes (s.a.) has demonstrated that by isolating Copan valley stelae from plaza stelae, it is possible to reconstruct a lunar count for the former group by utilizing groupings of seven lunar synodic months (cf. also Gaida et al., s.a.) rather than the usual six or five implied by the coefficients of Glyph C. If the Maya were attempting to approximate the length of the two halves of the tropical year by marking the equinoxes and/or solstices the way we propose they did with the 10-12 baseline, then they could have made specific use of a seven-moon-count as a convenient time check (the length of the seasonal half-year lies between six and seven lunar synodic months). Tear-Haynes suggests that confinement of the seven moon valley count to a short time period around 9.11.0.0.0 and to a specific provenience as well, offers the possibility that some calendrical experimentation toward this end may have been going on.

## **Remarks on Venus and Temple 22**

The idea that cosmological concepts and symbols might be reflected in the ceremonial architecture of the southeast Maya region is beginning to be taken

seriously by archaeologists (cf. e.g. Ashmore 1986). Our paper (Closs et al. 1984) was intended to offer one concrete hypothesis about how this was accomplished.

Having worked on the Southern Acropolis, Baudez employs a body of architectural/archaeological data to argue against our argument that the west window of Str. 22 functioned as a slot for following the movement of Venus. He couples this attack with more general remarks on the iconography of the temple in an attempt to deflate the notion that the building had anything to do with Venus at all.

His argument that the opening in Str. 22 is not unique has no foundation. Other openings do not now exist in the building, nor is there any solid evidence they ever did, as Hohmann and Vogrin (1982: 50 and Fig. 314) themselves admit:

Wallniches like the one around the West window, exist twice more in the same building, but there we have no exact knowledge concerning the form of the rear wall containing the niche; this leaves open the possibility that also these two niches in each case end in a similar window to the outside. In the North niche of the West room such a window could have existed without any difficulty (C 37-13-27); meanwhile in the East niche of the central North room the mass of the wall of a thickness of over eight meters would have had to be pierced. (Translation ours.)

The recesses hypothesized to have housed such windows appear as dotted lines or extrapolations in the reconstruction drawings. Marquina (1951: 598 after Trik) shows the two other 'niches' but there is no evidence that these ever possessed slits. All we know for sure is that the extant western window was a later addition.

The four tall, narrow slits in Str. 20 (actually there were five marked in the plan; see Hohmann and Vogrin, Fig. 176) are nothing like those in Str. 22. They possess no niches and the slits are more than double in height; therefore they cannot be used to argue against the uniqueness of the so-called Venus windows. Hohmann and Vogrin (1982: 46) comment:

The drawing-reconstruction of Str. 20 also could be combined with a former section. It resulted that a strange slit on the east side of the northern part of Str. 20 (this slit is marked in Fig. 327 - authors), which has the same width as those recorded by Maudslay in the southern West room, corresponds also in height with the ground floor. There is the question, whether here it refers to another slit-window of the never excavated North room, which was later closed, before filling the lower rooms.

Baudez' suggestion that the window of Str. 22 was probably used for 'aeration' because "the air would become unbreathable with the curtains shut" leaves one wondering why such windows are not integral to all Maya architecture.

The 'mere existence' of Str. 22A as a blockade to the sight line hypothesis is an overstatement. While we know that at the time of abandonment, Str. 22A stood in the way of seeing Venus, we do not now possess a decisive relative chronology for the two structures. One needs but a few generations to see a number of Venus cycles unfold and our hypothesis simply requires that Str. 22 preceded Str. 22A. The archaeological evidence suggests that Str. 22A could have been built after Str. 22, even after Str. 22 was modified to incorporate the window. However, that Str. 22A "leans against" and seems to function as an annex to Str. 22 supports the hypothesis that it is a later addition.<sup>1</sup>

Baudez' iconographic concepts and his interpretation of the results in Closs et al. (1984) are somewhat less well informed than his archaeology. His reference to the main function of Str. 22 as a "temple of Venus" is a simplistic notion and is not one of the conclusions of our earlier paper. Rather, we argued that the building is associated with a Venus-maize-rain complex forming a coherent pattern which is recognizable in Mayan ethnohistoric and mythological sources. The potential use of the west window for astronomical observations of Venus was seen to be consistent with this pattern. Our view was that Str. 22 reflects that pattern and implicates Venus, the maize, and the coming of the rains in an architectural statement. This does not deny that the building may also have served as a royal residence and may have emphasized the ruler's ritual involvement in the agricultural cycle of ancient Copan.

The reference to the Venus symbol (an accepted variant of T 510b which has been misidentified as T 2) with contrasting interpretations as "Venus" or "star" is misleading. The usual glyph representing Venus in the Dresden Codex has the form T 109.510b. On some occasions, the glyphic constituent T 510b is replaced by a half-form variant which, for convenience, we shall label T 510bv. Since T 109, the initial component of the glyph, is known to have the linguistic value *chak* and since *chak ek'* is a known Yucatec term for the planet Venus, it has been concluded that T 510b, or equivalently T 510bv, signifies *ek'* which is the Yucatec term for "star". However, it must be noted that on Dresden 47D the Maya used the "star" glyph by itself to represent Venus. Moreover, in iconographic context, the symbol is used in the headdress of the Venus god Lahun Chan on Dresden 47 and clearly refers to Venus.

In addition, the "star" glyph appears in a variety of compounds in the inscriptions. In all those cases where a non-ambiguous astronomical reference can be attributed to these expressions, that reference is to the planet Venus (Closs 1979, 1981; Lounsbury 1982).

The "star" glyph also appears in iconographic context in the inscriptions. Lounsbury (1982: 156-158) has identified a skull variant form of the Venus glyph occurring in the inscriptions of Copan and Palenque. He has noted the usage of a Venus skull mask worn as a pectoral by the warrior protagonist por-

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1 In a paper presented at the VII Mesa Redonda de Palenque (June 1989) W. Fash presented archaeological and epigraphic evidence which demonstrated that Str. 22A was erected not less than 41 years nor more than 67 years after Str. 22. Assuming the window of Str. 22 was constructed at the same time as the building this leaves plenty of time for viewing several Venus round through it.

trayed on Lintels 1-3 from Bonampak engaged in activities which coincide with significant Venus events. The Venus skull also appears as the headdress of Ruler A on Tikal, Stela 16, and again as the headdress of Ruler B on Tikal, Temple IV, Lintel 3. In both cases, the headdress is marked with the T 510bv glyph, giving further emphasis to the Venus symbolism of the headdress. Stela 16 commemorates a katun ending which was about six days before the heliacal rising of the evening star (Lounsbury 1982). Lintel 3 of Temple IV records, in sequence, a Venus event, the glyph for Yaxha, and the glyph for east (in this case signifying the point where the sun rises). From similar phrases elsewhere, the sequence should refer to an aggression against Yaxha which was astronomically timed to coincide with a Venus event. On the date in question, the morning star crossed the ecliptic. This means that Venus rose on the horizon at the same point at which the sun would rise, a fact which the Maya noted by appending the glyph for east to the phrase (Closs 1981, with modifications).

In the Maya languages underlying the glyphic inscriptions, the general term for "star" also has the special significance of Venus. For example, in Yucatec (Pio Perez 1898), the term *ek'* signifies both "estrella" (star) and "lucero" (morning star, Venus, Lucifer). In Cholti (Moran 1935), in Mopan (Ulrich and Ulrich 1976), and in Lacandon (Bruce 1979), the term *xulab'* refers to both "star" and "planet". However, Bruce makes clear that the Lacandon term is used with specific reference to Venus, and Thompson (1930) notes that among the Mopan, Chol, and Kekchi of southern Belize, Lord Xulub' is the name of Venus. In fact, in Mayan ethnohistoric and mythological sources, Venus, the sun, and the moon play a particularly active role, while the other planets and stars are almost ignored. In these texts, the most frequent and significant usage of the term "star" refers to Venus.

The above comments illustrate that in epigraphy, iconography, linguistics, and ethnohistory, the Maya used the term "star" as a proper reference to Venus. It is only rarely that we encounter the term in any other usage. The translation of T 510b and T 510bv as "star" technically is correct but is misleading to modern scholars, including Mayanists, because it suggests that the term refers to those celestial objects which we identify as stars. This is almost never the case. To reflect the actual symbolic or glyphic usage of the sign by the ancient Maya, it is almost always more accurate to describe it as a Venus sign.

In the Str. 22 paper, the only explicit Venus symbolism which we discussed were the Venus signs on the bicephalic monster. These signs did not simply mark one of the heads, as in examples elsewhere, but also appeared on the body of the creature. With Lounsbury's identification of the Venus skull in Maya epigraphy and iconography, it now seems likely that the large skulls at the base of the interior doorway of Str. 22, one on each side, fit into the same category. The pronounced upper teeth found on these heads is one of the chief characteristics of the Venus skull. Finally, it may be noted that Fash (p.c. June 12, 1986) has found additional fragments that may constitute more Venus glyphs on the stucco fragments on the west side of the structure.

Apparently, Baudez believes that in order to accept the hypothesis that Str. 22 was deliberately aligned with Venus, one must demonstrate that all mo-

numents that possess the Venus symbol (e.g. Altars G1 and the altar of Stela M) must also be Venus oriented. He does not complain that we find kin glyphs on stelae and architecture all over Mesoamerica and yet these structures are not necessarily oriented to face the sun. What reason is there to assume that the presence of the glyph always must imply an orientation? On the other hand, we have cited a well known example, the House of the Governor at Uxmal, in which the Venus glyph appears all over the iconography of a building that is also Venus oriented (Aveni 1981: S9). It is worth pointing out that in this case, the Venus glyph also adorns the mask of the rain god, Chac.

In the final paragraphs of his appraisal, Baudez discloses one rationale behind his debunking of archaeoastronomy, and particularly of Venus relations in the Copan architecture. He would have the Copan ruler be a sun king and Str. 22 a place, perhaps his residence, where he would appear in full majesty before his subjects. We do not deny the possibility that places of particular importance on the Southern Acropolis might have functioned as convenient perches from which to watch the rising sun. But, if Baudez had paid closer attention to our astronomical arguments, he would have understood that the rising sun is intimately related to Venus above all other celestial bodies (cf. also Aveni, s.a.). Moreover, the relation between the sun and Venus expressed in the iconography of the "bicephalic monster" is quite the same as one finds in a number of other Maya architectural settings (Schele and Miller 1986: 106; Aveni, s.a.). Thus, Baudez' idea on the function of Str. 22 is consistent with the importance we have attributed to Str. 22 and with the probable key role the king played in the agricultural life of ancient Copan.

Baudez specifically relates Str. 22 to Rising Sun as the ruler who built and used it. This ruler is not further identified in Baudez' paper and it is not clear whether it is the same ruler whom Kelley (1962: 333) referred to as New-Sun-at-Horizon. The latter ruler has also been called Yax Pac (Schele and Miller 1986: 326-327). If it is the same ruler, then one of the most important dates in his life, namely 5 Cib 10 Pop (~5 Cib 9 Pop), is associated with a complete Venus glyph consisting of the *chak* prefix and the "star" sign. This occurs on the east door of Str. 11 at Copan. Lounsbury (1982: 154-155) has assigned the date to the Long Count position 9.15.15.12.16. The date coincides with the first appearance of the evening star and also appears to mark the ruler's designation as successor or acting regent in place of his predecessor who was being held captive at Quirigua. His succession to full power took place some seventeen years later. Lounsbury notes that the Venus hieroglyph, complete with its *chak* prefix, "is employed elsewhere at Copan as a component in the string of appellatives and titles of the above-mentioned ruler". He goes on to say that the "Venus symbols and skulls that appear as iconographic elements in some of the monuments for which he was responsible may be indicative of the image that he acquired or had confirmed on this day".

In consequence, the epigraphic data implicate at least one ruler of Copan in a Venus cult, possibly the same ruler whom Baudez credits with the construction of 10 Str. 22. (Recently, Gaida et al. s.a.) have listed a number of date pairs at Copan that correspond to multiples of the Venus cycle.) As noted in our ear-

lier paper (Closs et al. 1984: 238), "we have concentrated on relating Venus to Str. 22 and the agricultural cycle" and "it should not be assumed that we are denying the existence or importance of similar solar relationships". We had focused on the Venus aspect of a Venus-Sun duality because its importance did not seem to have been recognized in earlier work. In his appraisal of our work, Baudez continues to overlook or ignore the Venus material, despite the fact that recent archaeological and epigraphic investigations appear to corroborate some of our earlier ideas.

There emerges an integrated wholeness to the astronomical hypotheses about Copan. The 10-12 astronomical sight line, the only one possible on the site periphery, relates to the solar calendar in a way that is consistent with the inscriptional evidence. Str. 22, at the center of the site, unites this solar baseline with the motion of the sun king's chief announcer star, the planet Venus. Little wonder that the same Str. 22 window that accomodates Venus also incorporates a view of the western component of the 10-12 baseline. In this case, Stela 10 is positioned precisely on the skyline rather than below it.

We agree with Baudez that individuals from diverse disciplinary perspectives must consult one another. However, it is unfortunate that Baudez concentrates on a dichotomy between archaeology and astronomy. Our Str. 22 paper, in particular, attempts to view the Mayan world through the eyes of the ancient inhabitants of Copan. In order to understand the Maya world view, the Mayanist must merge the findings of anthropology, archaeology, astronomy, ethnohistory, linguistics, iconography, and epigraphy into a cohesive and comprehensive whole. It is not a field of study in which the archaeologist occupies an a priori preferential position. Nor is it possible to create a model of the ancient Maya world using a one-dimensional approach. Indeed, the archaeologist is in danger of being left behind if he does not become familiar with developments in other areas of Maya studies.

## References

Ashmore, Wendy (1986):

"Peten Cosmology in the Maya Southeast: An Analysis of Architecture and Settlement Patterns at Classic Quirigua." In Patricia E. Urban/Edward M. Schortman (Eds.): *The Southeast Maya Periphery*, 35-50, Norman: University of Oklahoma Press.

Aveni, Anthony F. (1977):

"Concepts of Positional Astronomy Employed in Ancient Mesoamerican Architecture." In Anthony F. Aveni (Ed.): *Native American Astronomy*, 3-20, Austin: University of Texas Press.

- Aveni, Anthony F. (1981):  
 "Archaeoastronomy in the Maya Region: A Review of the Past Decade." In *Archaeoastronomy: Supplement to the Journal for the History of Astronomy*, No. 3 (Suppl. to Vol. 12): S1-S16, Cambridge/London.
- Aveni, Anthony F. (1982):  
 "Horizontal Astronomy in Incaic Cuzco." *Lateinamerika Studien* 10: 175-193.
- Aveni, Anthony F. (s.a.):  
 "The Real Venus-Kukulcan in the Maya Inscriptions and alignments." *Paper presented at 6th Mesa Redonda de Palenque* (June 1986).
- Baudez, Claude F. (1987):  
 "An Appraisal of Archaeoastronomy at Copan". In *Indiana* 11: 63-69, Berlin.
- Bruce, Robert D. (1979):  
*Lacandon Dream Symbolism*. Ediciones Euroamericanas Klaus Thiele. Mexico, D.F.
- Closs, Michael P. (1979):  
 "Venus in the Maya World: Glyphs, Gods, and Associated Astronomical Phenomena." In: Merle Green Robertson/Donnan Call Jeffers: *Tercera Mesa Redonda de Palenque*, Vol. 4, Pre-Columbian Art Research, 147-165, Monterrey, CA: Herald Printers.
- Closs, Michael P. (1981):  
 "Venus Dates Revisited." *Archaeoastronomy: The Bulletin of the Center for Archaeoastronomy*, 4.4: 38-41,.
- Closs, Michael/Anthony F. Aveni/Bruce Crowley (1984):  
 "The Planet Venus and Temple 22 at Copan." In *Indiana* 9: 221-247, Berlin.
- Gaida, Maria/Berthold Riese/D. Tear-Haynes (s.a.):  
*Calendar, Numerology and Astronomy at Copan*. Ms.
- Hohmann, Hasso/Annegret Vogrin (1982):  
*Die Architektur von Copan*. Graz: Akademische Druck- und Verlagsanstalt.
- Kelley, David H. (1962):  
 "Glyphic Evidence for a Dynastic Sequence at Quirigua, Guatemala." In *American Antiquity*, 27: 323-335, Salt Lake City.
- Lounsbury, Floyd G. (1982):  
 "Astronomical Knowledge and its Uses at Bonampak, Mexico." In: Anthony F. Aveni (Ed.), *Archaeoastronomy in the New World*, 143-168, Cambridge: Cambridge University Press.
- Marquina, Ignacio (1951):  
*Arquitectura prehispánica*. Mexico: INAH.
- Morán, Francisco (1935):  
 "Vocabulario en lengua cholti. Extract from Arte y diccionario en lengua cholti (1695/ca. 1635)." *The Maya Society*, Publ. 9, Baltimore.



Pío Pérez, Juan (1898):

*Coordinación alfabética de las voces del idioma Maya que se hallan en el arte y obras del padre Fr. Pedro Beltrán de Santa Rosa. Mérida, (Yucatán) (Re-edited, with an introduction by Michael G. Owen, Copy Mart, Seattle 1970).*

Schele, Linda/Mary Ellen Miller (1986):

*The Blood of Kings. Fort Worth: Kimbell Art Museum.*

Tear-Haynes, D. (s.a.):

*The lunar series at Copan (Ms.).*

Thompson, John Eric S. (1930):

*Ethnology of the Mayas of Southern and Central British Honduras. Field Museum of Natural History, Publ. 274. Chicago.*

Ulrich, E. Matthew/Rosemary Dixon de Ulrich (1976):

*Diccionario bilingüe: Maya Mopan y Español, Español y Maya Mopan. Guatemala: Instituto Lingüístico de Verano*

