COMMUNICATIONS

COMMENT*

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John Howland Rowe's review of *Archaeoastronomy in Pre-Columbian America* and *Native American Astronomy* ("Archaeoastronomy in Mesoamerica and Peru," LARR 14, number 2 [1979]: 227–33), both edited by me, deserves comment for two principal reasons: (1) by his own admission, Rowe has undertaken to review, in a brief space, not just a pair of texts but rather an entire area of inquiry involving the professional energy of a large number of scholars; and (2) his review, casting doubt upon such studies as it does, if not considered in a broader perspective and in the light of more recent developments, might lead to some misinterpretation regarding the methods, goals, and results of archaeoastronomy. For these reasons, I wish to offer a brief reply to Rowe's commentary with the hope of placing archaeoastronomy in a more realistic setting.

In his discussion of the Teotihuacan orientation problem, Rowe suggests that there is enough evidence available for us to believe that the city was laid out with its peculiar orientation because the Street of the Dead aligns more or less with Cerro Gordo, which was an important source of water. Wielding Occam's razor, he suggests that there is no need for the builders to have relied on the stars for a "fix," even though there is evidence that the Pleiades also were involved in the orientation problem. His solution is too simple and monocausal for anyone familiar with Teotihuacan and Mesoamerican cosmology. In *Native American Astronomy* (p. 5), and in my article with Sharon L. Gibbs ("On the Orientation of Pre-Columbian Buildings in Central Mexico," *American Antiquity*

*We would like to point out that the following "Comments" have been edited. In response to that editing, Professor Zuidema has asked that we include the following statement: "The editor has shortened Zuidema's comment, deleting most of his critical remarks about Rowe's abusive style of reviewing."—*Ed.*

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41, no. 4 [Oct. 1976]: 510–17; p. 516), the Pleiades hypothesis was discussed not simply because it matches the alignment direction but also because (a) this star group underwent heliacal rising on the day of solar zenith passage, (b) the group itself transited the zenith of Mesoamerican skies at the time Teotihuacan was built, and (c) there is abundant ethnohistoric evidence for the recognition of the Pleiades as an important celestial grouping throughout Mexico.

As if to discredit any role for astronomy in ancient man-made works, Rowe cites Hawkins' study of the astronomical properties of the Nasca lines, which he regards as a "massive investigation" with "convincingly negative" results. Far more critical and detailed analyses of Hawkins' work appear in the Winter 1980 issue of the *Archaeoastronomy Bulletin*; surely an unbiased reviewer ought to pay as much attention to negative as well as positive opinions.

In both the Teotihuacan and Nasca examples, Rowe's orientational posture flies in the face of what the chroniclers tell us about ancient Andean and Mesoamerican mental systems. Theirs was an integrated cosmic view, one that sought to interrelate every perceptual facet of nature. This synthetic view of the world held by the ancients is very different from that of the analytic Western scientist-logician. Rowe's review reads as that of an archaeologist who, desirous of being a true scientist, must quest for a single answer to each specifically defined problem; even if other promising threads of the fabric need to be clipped off, the finished product must be comprehended thoroughly, apart from its context.

Rowe goes on to criticize the relationship between astronomy and the ceque system of Cuzco, as it has been elaborated by Zuidema. He says that the determination of solstices in Cuzco by horizon observation "requires no equipment," and that although the Incas "erected sets of horizon markers on the western horizon at Cuzco," these markers have since been destroyed. Does this mean we can learn nothing about them? One of the central problems in the study of astronomical alignments is the determination of where celestial objects rose and set in the environment of the ancient observer. To duplicate the original situation, one needs to make certain corrections for precession of the equinoxes, horizon elevations, refraction, etc.; to this end, the modern investigator utilizes measuring equipment, such as a theodolite and a programmable calculator. If we seek to understand how social behavior patterns might have been related to the observation of the heavens, and how certain needs of ancient society were fulfilled by skywatching, then the use of technological equipment or lack of it on our part or, indeed, on the part of the ancients, is but a fraction of the total problem of how ancient astronomy ought to be studied. Also, the absence of archaeological evi-

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dence, i.e., material proof, is not the sole determining factor bearing on the validity of archaeoastronomical studies. The careful reader will note that it is the internal consistency among ethnohistory, archaeology, ethnology, and astronomy that characterizes the Zuidema-Aveni arguments about the ceque system. Rowe should have reviewed whether such interdisciplinary studies are capable or providing evidence on Incaic astronomy and calendar. For instance, the Anonymous chronicler (cited in note 11 of Rowe's review) tells us that the time indicated by the set of four viewing pillars on Cerro Picchu is August. We took the August date, together with theodolite measurements from the established sites of certain huacas, and deduced that the position of the ushnu, or observation point, must have been on the Plaza de Armas; thus, we demonstrated how even limited ethnohistoric data can be used to set bounds on the location of archaeological remains. The tendency of some modern investigators to admit only material evidence reflects the imbalance of synthetic and analytic elements in many aspects of modern Andean research.

Rowe's review is characterized by too many "either/or" sorts of judgment: either *all* ceque lines are straight or they are not; either they *are* astronomically related or they are not; either the Coricancha *or* the ushnu (or neither) was the observing place. In fact, our studies of the ceque system of Cuzco reveal that *some* of the ceques were straight, that *one* of them was an astronomical sight line, that *three* observation centers were used, that *two* astronomical sight lines crossed over the ceque system and, at the same time, passed through particular huacas of those ceques. Our interpretation of the situation is uncomfortable for the contemporary Western mind to deal with. We might prefer simply to have one central observer viewing along radial lines, rather than three centers of observation all directed to the west toward sets of unequal numbers of horizon markers. Nevertheless, the system as we understand it so far accords well with what we know about the social and religious structure of Cuzco, and the cosmology of the Andean people.*

Archaeoastronomy, if viewed in the perspective that I intended (and so stated in both introductions), is *more* than the study of ancient astronomy through the use of archaeological data and the use of ancient texts. Archaeoastronomy is an interdisciplinary meeting ground for those who are concerned about the perception and conception of the natural world by the people of ancient civilizations. The most successful, serious contributors are commited to becoming educated in the ways of other disciplines that they recognize as important, because these disci-

*R. T. Zuidema, "Observing the Sun in Zenith or Nadir in Cuzco." Paper presented at the XLIII International Congress of Americanists, Vancouver, B.C., August 1979. A. F. Aveni, "Horizon Astronomy in Incaic Cuzco." Paper presented at the XLIII International Congress of Americanists, Vancouver, B.C., August 1979.

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plines border closely upon their own fields of inquiry. Admittedly, the wedding of "archaeo" and "astro" has done much to lend an avant garde tone to the field, and the wave of "pop literature" accompanying it does not help matters. Because archaeoastronomy seeks to understand the behavior and evolution of human mental systems it should be properly attached to cultural anthropology. For those who comprehend it fairly, broadly, and thoroughly, it has already begun to be viewed in that perspective.

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