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Pulltrouser Swamp: Ancient Maya Habitat, Agriculture, and Settlement in Northern Belize
by B. L. Turner II; Peter D. Harrison
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be inferentially related to seasonality. The result (p. 90) is clearly multimodal and appears not to conform at all well with the Navajo pattern. But, since Powell's hypothesis requires bimodality, she is forced to create such patterning. She does so by partitioning the data set into "large" sites and "small" sites based on the "interior-habitation area" variable. This exercise is carried out three times using three distinct low points, or breaks, in the multimodal histogram as the cut-points. She then calculates three sets of t-tests (one set for each partition), comparing "small" sites with "large" sites for the remaining 12 Anasazi variables. The partition with the greatest number of significant (.10 level) variables is selected as the best representative of bimodality and it is used in all subsequent analyses.

This procedure is highly questionable and represents little more than a univariate fishing expedition. Powell further subdivides the data on the basis of gross age (early and late), thus creating four classes of sites: Early-Small, Late-Small, Early-Large, and Late-Large. This paradigmatic classification has no necessary or demonstrable bearing on the question of seasonality, and the floral and faunal materials associated with these site types lend little quantitative support to the biseasonality hypothesis. In sum, the notion that the Black Mesa Anasazi may have been more mobile in their adaptive pursuits than traditional interpretations allow remains an important, interesting, and intriguing possibility, but it is neither supported nor refuted by the statistical analyses under review. As Powell notes in conclusion, "no problems were definitely resolved; no definitive answers were generated. Instead, more typically, further research is necessary" (p. 140).

Powell's quantitative work is a step in the right direction, but it is doubtful that the complex problems of settlement analysis will be resolved through univariate hypothesis testing; multivariate pattern-seeking techniques will be required. I suspect that there is much more to be gleaned from the massive Black Mesa data base and look forward to additional synthetic attempts by Powell and her associates.

The small country of Belize has produced another milestone for Mayanists with the publication of Turner and Harrison's second major edited volume. Whereas their first book (Prehispanic Maya Agriculture, 1978) examined the range of agricultural adaptations in the Maya Area, Pulltrouser Swamp more fully addresses the form and function of raised-field agriculture through a well-orchestrated, multidisciplinary field program. The raised and channelized fields represent salient data on intensive agriculture in the low-lying riverine and bajo settings of the Southern Maya Lowlands.

Pulltrouser Swamp lies in northern Belize along the slow-moving New River. Approximately 311 ha of raised and channelized fields have been defined. The graphic name of the site area seems fitting, given the strong ecological bent to the project—its concern with soil composition and water management rather than the recovery of whole pots and temple facades.

The book is divided into two parts: a presentation of the environmental setting and a treatment of settlement history. The success of the book is in part due to the careful soils analyses and interpretations. Turner and Darch provide evidence for deliberate landscaping within the swamp. First dealing a death blow to the gigae hypothesis (that natural patterns caused by wet/dry episodes in clayey soils resemble raised fields), they show that the motled, silty matrix defined for the fields is a consequence of the deliberate importation of nearby mainland soils and canal muck. Wiseman examines the pollen evidence and presents the case for a littoral environment at Pulltrouser before field construction, with a subsequent encroachment of escoba and botan swamp forest following abandonment of the fields. In concert with Miksicek, the data for the suite of economic crops grown on the fields are presented, though the authors admit a considerable amount of interpretive ambiguity in the data. The paper by Covich is a concise summary of the Pulltrouser molluscan data. It is a valuable synthesis that outlines the potential for environmental reconstruction from wetland clams and snails.

The second half of the book examines the settlement pattern survey around the margins of the swamp. Harrison provided the guidance for this study. His maps are excellent, though a complementary contour map would have helped the reader to understand the derivation of his estimated orientations for individual structures. The settlement survey concentrated on the community of Kokeal covering 1.08 km², though Harrison has since mapped


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adjacent portions of the swamp zone. Ettlinger carried out an excavation program to complement the field survey at Kokeal. Significantly, a well-manifested Late Preclassic component was identified within the settlement as well as the fields.

Fry's ceramic analysis is a good synthesis, particularly in view of the limitations placed on him by the small, eroded samples. A high relative frequency of Cocos Chicanel (Late Preclassic) and Santana Tepéu (Late Classic) sherds follows from Ettlinger's stratigraphic evidence. Shafer provides the lithic analysis for the project and draws heavily from his experience with the Colha chert industry. His study is timely because Pulltrouser Swamp is a well-documented consumer of tools produced 28 km away at Colha. Shafer convincingly argues that tools were shipped in as finished products, given the absence of primary flaking debitage.

In the concluding chapter, Turner and Harrison tie their results to a population-growth model in addressing the continuum of developments occurring in Pulltrouser Swamp. However, there is little clear evidence to support the idea of an overly successful upland slash-and-burn adaptation forcing populations into marginal swamp settings by the Late Preclassic period. Recent literature from both the New and the Old World indicates that swamp and flood plain settings may have been some of the first zones exploited for agriculture. Given our level of interpretative license, it might be best argued that many different adaptations were carried out simultaneously in the lowlands.

This is an important study. It is a well-written and coordinated collection of papers focusing on wetland agriculture from a very circumscribed area. It will serve as an empirical datum for generalizing about intensive agriculture and its role in the origins and maintenance of Maya civilization.


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Iron and steel metallurgy in Europe began about 1000 B.C., initiating a period archeologists label Early Iron Age or Hallstatt. The scale and intensity of industrial activities increased markedly, as evidenced not only in metal working (bronze, iron, gold) but also in mining and ceramics. Salt began to be exploited on an industrial scale. Trade and exchange in these and other commodities grew rapidly. Trade with the Mediterranean civilizations—Greece and Etruria—is evidenced by luxury import items found in high-status (“princely”) burials.

Research on the Iron Age of central Europe has concentrated on funeral information; settlements have rarely been investigated, apart from a few large fortified hilltop sites. Peter Wells's problem-oriented excavation of the Hascherkeller site, therefore, represents a pioneering effort at rectifying the bias in our information base. His purpose in excavating an ordinary Early Iron Age farmstead was to obtain information on the subsistence economy of a rural settlement and on their economic relations with the wider Hallstatt world. To what extent were the changes at the beginning of the Iron Age reflected in a rural community?

Hascherkeller was occupied during the shift from Late Bronze Age to Early Iron Age. The land surface of the time of occupation was not preserved; most artifacts and data came from several large pits. Architecture was evidenced solely by daub fragments found in the pits; no postmolds were preserved except in the ditches enclosing the site, where they indicate a stockade. A pottery kiln was found outside the ditch that enclosed the settlement. The casting of bronze objects at the site is attested by a stone mold, and textile manufacture by loom weights and spindle whorls. Five lumps of iron slag suggest iron working, but no other supporting evidence was found. The bronze recovered can be regarded as lost items; all pieces were fragmentary bits. Thus, as expected, the farmstead was not producing for the wider economy.

Rural Economy in the Early Iron Age is a site report with a number of specialist contributions, some of which are not well integrated into the sections written by Wells. For example, modern iron pieces were found in excavation. They should have distorted the magnetometer survey, but there is no discussion of this. Also, the possible implications of the iron slag receive no comment in sections dealing with activities at the site.

Some aspects of the excavation procedure can be criticized. No system for numbering features seems to have been employed, so we must deal with "Pit at the north end of Trench N" and the like. Plans of tops of pits are illustrated, but the depositional structure of pits is inadequately presented.