Results of recent excavations at Jenné-jeno and Djenné, Mali[*]

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The large settlement mounds in the Inland Niger Delta of Mali (hereafter, IND – Figure 1) have become renowned in African archaeology because of their sometimes vast size, their number and distribution on the floodplain, and the impressive material culture they produced, including several well-known styles of terracotta statuary. We undertook archaeological research at the mound of Jenné-jeno and its neighboring sites (Figure 2) for a total of 16 months in 1977 and 1981. The results of these excavations and the data base on which we based our claims for the precocious growth of these settlements into an urban complex have been fully published (S.K. McIntosh 1995; S.K. and R.J. McIntosh 1981) In this paper, we summarize briefly the results that have emerged so far from three archaeological project carried out in collaboration with numerous colleagues in the 1990's: in 1994, a coring project at Jenné-jeno, Djenné, and several neighboring sites; in 1997, a rescue archaeology project conducted in several areas of Jenné-jeno endangered by erosion; and in 1999, excavation in the occupied mound of Djenné in anticipation of the construction of the new Djenné Museum. We will discuss these projects in order.

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The 1994 Coring Project

The 1994 coring project was experimental in nature, and involved the removal of numerous 50-70 mm diameter cores at various locations in Djenné and Jenné-jeno. We sought to determine how informative the cores might be regarding the chronology, nature, and depth of deposits. This experiment with small-diameter augurs was an attempt to respond to the central challenge of archaeology at the habitation mounds of the IND, namely, that they tend to be large (up to 30+ ha) and deeply stratified (3–6 m of deposits – Figure 3), so proper excavation to recover the complex depositional histories of these sites is slow work. In our experience, a team of five workers and an experienced supervisor can excavate and properly document the removal of one cubic meter of deposits per day on average. This laborious speed reflects the difficulty of digging the highly compacted clay deposits of these sites, as well as the time-consuming task of properly recognizing and recording their complex stratigraphy. The sites are being destroyed by erosion and looting at a much faster rate than archaeologists can excavate, even if sufficient funds and trained personnel available for full-time excavation, which of course they are not. Jenne-jeno, estimated in 1981 to have 1.3 million m^3 of deposits, has lost approximately 10% of its deposits to severe erosion in certain sectors of the site over the past twenty years. That is on the order of 130,000 m^3, which would have taken 100 crews of five workers plus a supervisor almost four years of continual work to excavate before the deposits were lost to erosion. Nature and looters seem to hold the advantage in this race against time to recover and understand the extraordinary sites of the IND before they disappear. We undertook the experimental coring project in collaboration with an Uppsala University team led by Paul Sinclair in order to evaluate how useful coring might be in recovering subsurface data without excavating.

Fifty-one successful cores were lifted - twelve on Jenné-jeno, thirty-four on Djenné, and five at other, neighboring sites. The coring team quickly discovered that the weathered surfaces of abandoned mounds are incredibly hard, such that actually getting

the core started was a difficult and time consuming task that frequently resulted in broken drill bits. Coring was easier in the occupied mound of Djenne.

One objective of the coring was to evaluate the utility of the cores for determining the chronology of deposits through recovery of diagnostic potsherds. At Jenné-jeno, for example, where a confirmed ceramic chronology with numerous time-sensitive features was established in the course of the 1977 and 1981 research (Figure 4), we hoped to be able to determine the extent of any overlap in its occupation history with that of Djenné. Although diagnostic sherds were rare in the cores from Jenné jeno, several cores (five out of twelve) produced material characteristic of phases I/II, III, or IV, spanning the known period of Jenné-jeno's occupation from 200 BC to AD 1400. From the 34 cores from Djenné, however, no pottery dating earlier than AD 1000-1200 (early Phase IV) was recovered from any core. From these very preliminary data, we conclude that there are no data as yet to indicate that Djenné was settled earlier than AD 1000. The growth of the existing town may well have been related to the decline of Jenné-jeno after AD 1200 and its ultimate abandonment by AD 1400. Further work is required to evaluate this hypothesis.

A second objective was to evaluate how well coring permitted discrimination between natural and anthropogenic deposits, and primary deposits vs. fill from looters pits or other secondary disturbances. Coring performed exceptionally well, permitting conflicting hypotheses for mound formation to be easily assessed. In the case of Kobassa Boro, for example, which we identified as an occupation mound of anthropogenic origin in 1981, but which D. van der Vaals suggested might be a dune with occupation scatter on top, coring demonstrated that cultural material and clay from eroded structures extended down through several meters of mound deposits. The cores also provided a quick and reliable way to identify primary, intact deposits as opposed to disturbed or looted and refilled areas. This method potentially offers archaeological heritage managers in Mali a fast and minimally intrusive way to avoid salvage work in areas of

recent secondary deposits. In addition, it provided a quick method for determining the depth of anthropogenic deposits, permitting a preliminary map of accumulation depths to be drawn for Djenné. Deposits ranged from under two meters to over eight meters. A full exposition of the results of this project may be found in McIntosh et al. 1996.

1997 Excavations at Jenné-jeno

These excavations were funded by a grant from the World Monuments Fund to Dr. Boubacar Diaby, director of the Mission Culturelle at Djenné, to effect some salvage archaeology in areas of Jenné-jeno that were threatened by erosion. Another, equally important part of the project was stabilization of the surface of the mound to stem the rate of erosion. The stabilization project was under Dr. Diaby's direction and is not discussed here. At Dr. Diaby's request, we joined the archaeological team, which included Dr. Tereba Togola, Mr. Mamadou Cissé, Ms. Mary Clark, and Mr. Karol Stoker. Major erosion gullies were sectioned in two areas (CP1 and CP2 on Figure 5), and four excavation units measuring from 4–12 square meters in area were excavated. This allowed us to sample some parts of Jenné-jeno that had not previously been investigated. Figure 5 summarizes the depth and chronology of the deposits excavated in 1997 as well as in previous field seasons. Although the individual excavation units are generally small (with the exception of LXS/LXN dug in 1981, which measured 10x6m), and some archaeologists prefer larger units, the advantage of digging many small units (vs. one or two large ones) is beginning to emerge. Because so many different areas of the mound have been sampled, we have a considerable database on functional differentiation (domestic, funerary/ritual, artisinal) and shifting use through time. For example, the southeastern (units JF1 and CTR) and northwestern (unit KIS) sectors of the mound became cemetery/ritual precincts in Phase III (A.D. 400–950). Cemetery burials in Phase IV have been found only in the northwest sector (unit WFL),

however. Elsewhere in Phase IV, some individuals were buried in upright urns deep under house floors. This pratice has not been documented for Phase III.

Reconstructing a complete picture of site usage and occupation in Phase IV is impossible, however, as we now understand in the wake of the increased rainfall that pummeled the region in the 1990's. The surface of Jenné-jeno has been dramatically altered by erosion over the past decade as a consequence. On many slopes and low lying areas of the site, evidence of the full extent of the Phase IV occupation has almost certainly been scoured away by erosion cycles at various times since abandonment.

Among the most intriguing and unexpected patterns, given the size of the settlement at Jenné-jeno and its intensity of occupation, is the low social differentiation across the site, as measured by quantity of imports (including all copper, iron, stone, and glass artifacts). For each excavation unit, the average number of exotics / 10 cubic meters of deposits was calculated (Figure 5). Density was notably low, ranging from 0.5 to 5 in all units, except the two (SB and HK) from which no imports were recovered (CP 1 and CP2 were excluded from the analysis because so little deposit was removed in the cutback of the erosion surface). This evidence for lack of significant wealth variation across the site is supported by funerary ritual, in which grave goods are largely absent. It is certainly possible that wealth was displayed at Jenne-jeno by categories of material culture that have not been preserved, notably, textiles. But it is a bit surprising to find so little intrasite variation in imported copper and stone, for example.

The 1997 research afforded several new insights into the history of mound development at Jenné-jeno. One significant discovery was the location in the area between units TK and SB, of an eroded area approximately 50x30m in extent composed of sterile floodplain clay that had apparently been deposited to a height of over 2.5 meters, perhaps for the purpose of enlarging the mound. Excavations at SB revealed a phase of city wall construction that differed considerably from that documented in 1981 at NWS. In the northern part of the mound, the cylindrical bricks (djenne-ferey) of the

wall were of a generally uniform size, measuring 10-12 cm in diameter. In the south, at SB, the bricks had a wider range of sizes, with many bricks measuring 20 cm or more in diameter. This may represent a later phase of city wall expansion along the current southwest perimeter, since the city wall in SB had been erected over the foundations of a Phase IV house. In unit NWS, the city wall was erected on Phase III deposits. This hypothesis of different episodes of city wall construction requires further investigation.

In overview, the 1977 research involved the investigation of several areas of Jenné-jeno not previously excavated, confirming the sequence of material culture and architectural technology established by earlier excavations, and permitting the expansion of the data base on site usage through time through salvage work in areas seriously menaced by erosion.

In addition to the work at Jenne-jeno, the 1997 season saw related research on the Jenne-jeno mound complex carried out by Mary Clark, a graduate student at Southern Methodist University. The primary objective of her investigation was to explore further the settlement organization represented by the nucleated settlement clusters in the proximity of Jenne-jeno. This involved re-surveying all the sites in the maximal cluster centered on Jenne-jeno (Figure 2) and conducting shallow, subsurface excavations at visible structural remains at a sample of previously untested sites. The result is an expansion of the existing database with basic spatial, temporal, technological, and subsistence information. This permitted a more rigorous exploration into the organizing principles conditioning surface variability, as well as into the assumptions underlying the previously proposed organizational model, namely, that the clustered sites represent contemporaneous settlement by occupational specialists (R. McIntosh 1991, 1993).

Clark's preliminary findings to date support claims of inter-site specialization in pyrotechnological activities, as evidenced by spatially segregated concentrations of furnaces on three of the mound sites. However, radiocarbon results suggest that these activity areas were not used simultaneously. Further intersite as well as intrasite

temporal variability was detected among visible surface domestic features (houses and granaries), indicating differential use over time and space despite apparent association with surface pottery of a single phase or sub-phase. While it is evident that post-depositional erosion has played a role in the present composition of visible surface features, there is some evidence to suggest greater population movement, and perhaps seasonal utilization of sites, within the Jenne-jeno maximal cluster in from the end of the first millennium AD. Further analysis of temporal and spatial variability in surface material will tell us much more about the dynamics of this clustered settlement organization and the role of the specialist producer.

The 1999 Excavations at Djenné

The 1999 excavations at Djenné were undertaken with private foundation funding secured by Rod McIntosh and myself at the request of then Directeur National de la Culture, Dr. Tereba Togola, to excavate a sector of Djenné due to be impacted by the construction of a new museum. The plan was for the excavation to be left open, covered with a roof and protected by plexiglass to form a living museum of the town's history, in which visitors could literally walk down into Djenné's past. With uncertainties over the schedule for the Museum construction, the excavation was subsequently back filled to avoid erosion, but can be reopened when the Museum is completed.

The future Museum site is on the location of the colonial dispensary (Figure 6). Coring in 1994 near this location had indicated a considerable depth of deposits. A unit measuring 6m x 4.75 m was excavated down to sterile floodplain soil, which was encountered at 7 meters depth, although trash pits extended down into the floodplain another two meters. The top 1.5 meters of deposits were composed of the tumbled cement and brick walls of the Dispensaire, recent accumulations of trash and blue plastic bags (indicating deposition since c. 1980) and underlying debris associated with the operation of the dispensary in the first half of the 20th century (glass ampoules, bottle

glass, no tobacco pipes). The cement floor of the dispensary was found between 1.25 and 1.5 m. Below it, we encountered a wall made of large and irregular djenne-ferey that our local foreman, a mason, immediately recognized as an inferior construction produced under conditions of forced labor. From 2.0 to 6.5 m depth, we encountered a series of superimposed walls, floor surfaces, pits, and a granary with considerable amounts of rice. A well lined with superimposed, open-bottomed pots was dug from a depth of 6.4 m down to 9.0 meters. The water table today begins at 8.5 m, below which deposits were waterlogged. There were also several trash pits dug from the initial occupation surface at 7 m depth down into the floodplain.

The chronology of these deposits is indicated by the material culture they produced. Above the dispensary floor, 20th century rubbish was recovered. Beneath the dispensary floor, 19th ~~and 18th~~ –17th century deposits were identified, with masses of imports, including bottle glass and gunflints, cowries, hundreds of tobacco pipes (McIntosh et al. 2003), and pottery similar to the assemblage at Hamdallahi described by Gallay et al. (1990). The average density of exotics in these deposits exceeded 37 per 10 cubic meters.

Tobacco pipes, gunflints and cowries and most other exotics disappeared between 4.5 and 5 m depth. Interestingly, at this depth a broken pot with a Koranic inscription conferring a benediction on a new house was found under a foundation wall. The sherd bore an underlined number – 519 – which may be a date. If so, it corresponds to C.E. 1125/26, which certainly is not the date of the deposits, but it may commemorate some much earlier event. The pottery increasingly resembles Phase IV pottery at Jenne-jeno, although late Phase IV forms are associated with pots possessing some Phase V (A.D. 1500-1900) characteristics, such as carelessly applied slip (lots of drips and splashes) and the use of large, coarse stamp and comb impression. As a first approximation, we place these early deposits somewhere in the 15th to 17th century. This appears to be the earliest occupation at this locale in Djenné. It goes without saying (but

can never be said too often) that the information from this excavation represent a limited sample that cannot be reliably extrapolated to indicate the occupation history of all of Djenné . Much more excavation will be required in different sectors of the town before we can begin to understand how and when various quartiers were settled and expanded. Analyses conducted thus far have not yielded any information on the possible reasons for the new settlement at Djenné.

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Rice University. M. Bertie Sékou and Mary Clark were instrumental to the success of that interactive venture. The U.S Ambassador to Mali, Dr. David Rawson, provided logistic support and encouragement for the research and the interactive project and graciously opened his home to us while we were in Bamako. In Djenné, we had the good fortune to again have lodgings with our friends Dani and Yama Traoré.

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CAPTIONS

Figure 1. Map showing the location of the Inland Niger Delta and Jenne-jeno, in relation to other major sites.

Figure 2. Map of the more than sixty archaeological sites that are clustered within a short distance of Jenné and Jenné-jeno. The concentration of population on a few very large and many, smaller, closely-clustered sites is a highly original aspect of urban development in this region. (Computer-generated map by Mary Clark)

Figure 3. Topographic map of the Jenne-jeno mound (computer generated image by M. Petrén)

Figure 4. Pottery sequence developed for Jenné-jeno. Far from a standard *chronotypologie*, the sequence covers diachronic variation in a range of attributes, including form and decoration, rather than concentrating on describing the assemblage in terms of a few time-sensitive "types".

Figure 5. Map of Jenné-jeno, showing the location, depth of deposits, and Phase chronology of all units excavated to date. Above each excavation column, a number indicates the average density of imports in each unit.

Figure 6. A 1921 map of Djenné shows the location of the Dispensary (outline emphasized). The 1999 excavation unit was located in its northwest corner. (Map reprinted in Maas and Mommersteeg 1992)