Chapter 3
Excavation and Analysis Methods

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Archaeological work began at New Philadelphia with the assistance of Likes Land Surveyors, Inc. of Barry, Illinois. They located the original plat and imposed the town plan over the existing topography, marking the boundaries of the town, blocks, and lots. Likes Land Surveyors, Inc. then produced a map, which was overlain on an existing aerial photograph, which then guided our initial archaeological survey in the fall of 2002 and the spring of 2003 (Gwaltney 2004).

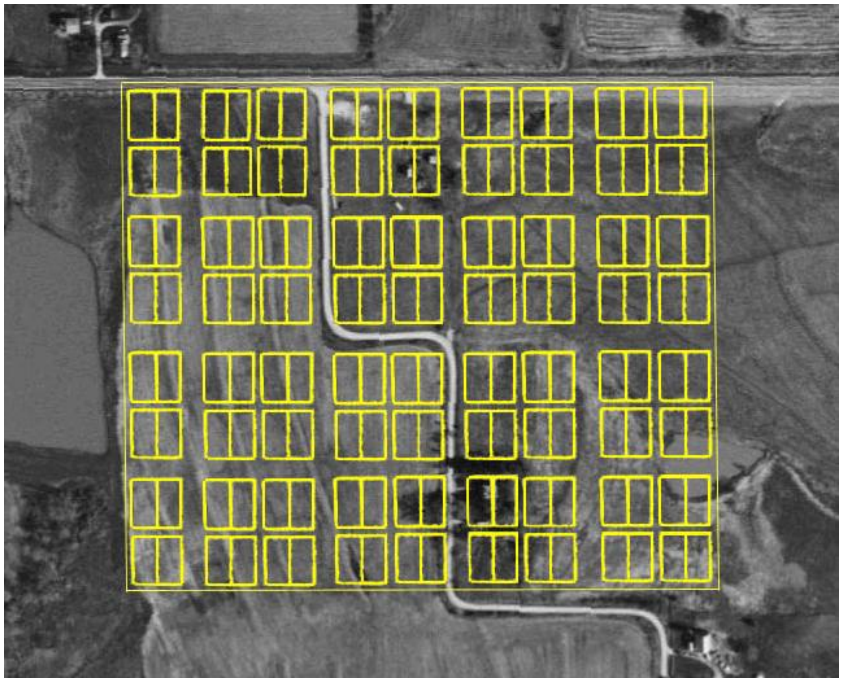

Figure 3.1. *1998 Aerial photo with town plat map overlay (Image courtesy of Christopher Fennell).*

Survey and Excavation Techniques

In order to create an excavation and research strategy, the archaeology team decided that a pedestrian survey should be the initial phase of work. The survey helped locate and identify artifacts on the surface and allowed the archaeologists to determine which areas were settled within the town proper. The walk over survey under the field supervision of Joy Beasley and Tom Gwaltney provided important information that furnishes artifact distributions over the site. The clustering of artifacts shows distinct patterns that are highly informative for understanding the town's settlement. The analysis of the plow zone data indicated that there were large

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concentrations of artifacts found within the lots bordering Broad and Main Streets in Blocks 3 (Lots 3–6), 4 (Lots 1, 2, and 8), 7 (Lot 1), 8 (Lots 1–8), 9 (Lot 5), and 13 (Lots 3–4) (Figure 3.2). While the archaeological data from the walk over survey were from a plowed context, the artifacts provided some very important information that guided our excavation strategies. This information indicated that there is a high probability of locating domestic occupations of the town, especially along Broad and Main Streets (Gwaltney 2004).

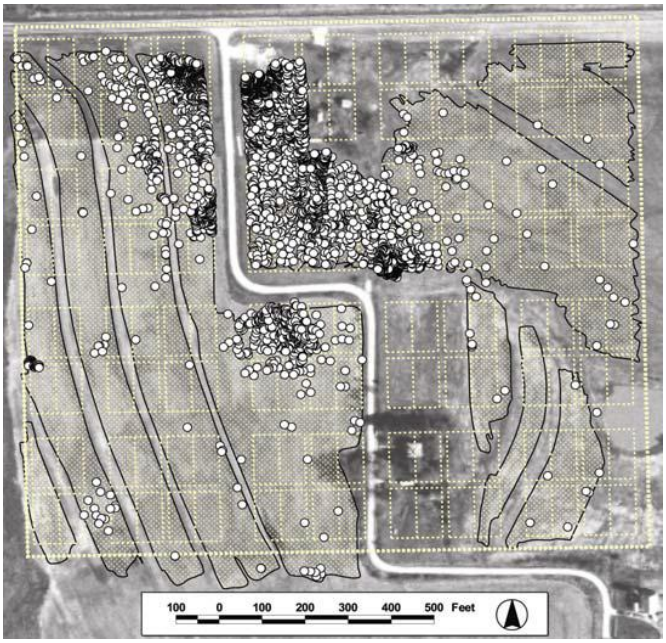

Figure 3.2. *Distribution of historic artifacts found at New Philadelphia (image from Gwaltney 2004).*

After determining the areas of highest artifact concentrations, geophysical surveys were performed by Michael Hargrave and Carl Carlson-Drexler (U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory [CERL]) for three days at the beginning of each field season. This work, using several geophysical methods including electronic resistance and magnetometry, indicated the presence of subsurface anomalies. Thermal imaging cameras were used in an aerial survey of the New Philadelphia site in 2008, conducted by Bryan Haley and Tommy Hailey (Haley 2008). A LIDAR survey was also conducted on the town site and the surrounding area in 2011, the results of which are being analyzed in an ongoing basis for different areas of the town's vicinity (Fennell 2011). Further discussion of the variety of survey methods used in this multi-year project is presented in Chapter 13.

Prior to excavations the archaeology team used a one-inch diameter core to test many of the anomalies. Resistance from stone or artifacts, or finding cultural material in the core samples, such as plaster and mortar, is an indication of a subsurface feature. This combined work allowed the archaeologists to concentrate excavation units on more specific areas of the town site.

In general we have a very good sense of land ownership (based on deed research), the general population of the town (based on census data), and the development of the lots (based on tax records). Based on the historical documentary evidence, archeological survey, and geophysical survey, the archaeology team chose to work in several areas of the town site, including: Block 3, Lot 4; Block 7, Lot 1; Block 8, Lots 1 and 2; Block 12, Lots 3 and 4; Block 13, Lots 3 and 4; and, an area in King Street north of Block 8. Several other areas of the site were investigated for geosciences studies on the soils (Chapter 12, "Status of geoarchaeological investigations at New Philadelphia Historical Landmark").

The archaeology team used engineer's scale (tenths of a foot) since it is the most commonly used form of measurement in historical archaeology. The archaeology work then proceeded in two steps. First, a form of sampling using 5 x 5 ft. excavation units retrieved data from the town lot and gave us a sense of the plow zone, subsurface features, and artifact concentrations. Second, the archaeology team selected anomalies identified in the geophysical survey and systematically sampled them using a one-inch corer. If feature material, such as mortar, stone, artifacts, or unusually deep subsoils were encountered, we tested these areas through controlled excavations. Once features were identified excavation teams preceded with a larger block excavation using 5 x 5 ft. excavation units as a standard, but some units were smaller or larger if the case warranted (Figure 3.3).

Figure 3.3. *Example of standard 5x5 ft excavation units (Photograph courtesy of Doug Carr, Illinois State Museum).*

Generally, the archaeologists removed plow zone materials in 0.5 ft. arbitrary levels until they encountered features or subsoil. Since most of the area was plowed these excavations proceeded quickly until the archaeology team encountered subsurface features and/or undisturbed

stratigraphy below the plow zone. Features, such as subfloor cellar pits, foundation walls, cisterns and wells, were bisected and excavated according to stratigraphy, and the team systematically collected soil samples for flotation in order to retrieve archaeobiological data.

The sod and plow zone layer of each unit was labeled A, with an additional number marking each 0.5 ft arbitrary level (A1, A2, etc). At the first soil change after the plow zone, denoting a different stratum of soil, the labeling system switched to B (in addition to a number per arbitrary level within it, if necessary), and would again change to C and so on, if more soil changes were encountered.

Lab Work and Analysis Methods

During each season, five weeks of fieldwork at New Philadelphia were followed by five weeks of laboratory work and analysis at the Illinois State Museum (ISM) Research and Collections Center (RCC) with museum staff members serving as additional mentors. Students cleaned, labeled, and identified archaeologically retrieved data. The data were recorded on paper spreadsheets then entered into a computer database (Figure 3.4). Students then performed a minimum vessel analysis for the archaeological materials found in undisturbed contexts, and performed further research on identifiable artifacts. Students also learned stabilization and identification procedures for archaeobiological specimens. Marjorie Schroeder (ISM) mentored students during the macrofloral analysis. The students processed soil samples through a flotation device in order to recover archaeobotanical remains, small–scale animal remains, and very small artifacts, such as glass beads.

Figure 3.4. *NSF-REU Field school students John Schultz and Tyquin Washington process artifacts at the ISM-RCC (Photograph courtesy of Doug Carr, Illinois State Museum).*

Terrance Martin mentored the field school students with the identification of animal remains and demonstrated various ways of categorizing anatomical elements as cultural entities (skeletal portions and butchering units), recognizing natural modifications (e.g., carnivore and rodent gnawing) and cultural modifications (burning, sawed or chopped margins, and knife cuts), and quantifying faunal assemblages in terms of specimen counts, minimum numbers of individuals, and biomass (Figure 3.5).

Figure 3.5. *NSF-REU Field school student Amanda Burtt at work in the zooarchaeology lab (Photograph courtesy Doug Carr, Illinois State Museum).*

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