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The historic sites in the Finger Lakes National Forest contain a rich repository of material culture from the early-19th century through the Great Depression of the 1920s and 1930s. As discussed in the introduction to this volume, one goal of the Finger Lakes National Forest Archaeology Project was to identify and document the various aspects of this historical archaeological record in order to provide an inventory of cultural resources within the Forest. Given the limited budget and personnel available to our project, a large scale program of artifact recovery and analysis would have impeded the completion of this inventory. However, during the course of the initial survey of sites in the Forest, it became clear that many sites contained relatively rich scatters of material culture on the surfaces of yard areas around some architectural features. A limited program of surface collection, focusing on diagnostic and potentially datable historic artifacts, was undertaken at a small number of the sites in the Burnt Hill Study Area of the National Forest (FIG. 1). Preliminary test excavations identified early - 20th century distilling technologies at Site 60-1 and investigated the possibility of bootlegging. While this article presents a preliminary analysis of the material culture recovered from these surface collections and test excavations, its primary goal is to suggest how GIS databases, and this one in particular, can be used to manage and interpret artifact assemblages.

Constructing a GIS Artifact Database

While the use of database software packages for constructing artifact catalogs is widespread in archaeology (Richards 1998), a brief account of the cataloging system developed by the Finger Lakes National Forest Archaeological Project is provided, as the structure of the catalog is crucial for its utility within a GIS. Microsoft Access was chosen as the appropriate software platform for the project catalog because it is a fully relational database program, and can be translated into an Excel spreadsheet; when saved as a ".dbf" extension, this spreadsheet can be read by ArcView GIS without losing any of the more sophisticated functions enabled by Access. An important advantage of fully relational databases is that larger data sets can be split into smaller clusters (e.g. the artifacts from one site), allowing for greater manipulation of the catalog without the loss of comparability between clusters (i.e., comparisons between assemblages from different sites within the same database).

A data entry form was created in Access allowing for the attributes of each artifact to be entered into different fields. Descriptive data were entered for each artifact via a sequence of fields that progressed from general to specific. These fields were titled "class" (e.g., ceramic, glass), "type" (e.g., coarse stoneware, refined earthenware), "variety" (e.g., ironstone, whiteware), "form" (e.g. plate, bottle), "manufacture" (e.g., blown, molded), "hallmark," "date range," "count," and "comments." For ceramic artifacts data was also recorded in the fields "glaze," "rim decoration," and "body decoration." Data were entered using comprehensive labels and descriptions rather than codes for several reasons. Most importantly, the usefulness of the database by later researchers would not be dependent on the availability of a "key." It was assumed that end users of the database would be individuals other than project members responsible for data collection and entry. Additionally, the ease of using software that repeats or copies information from prior records meant that the repetitive nature of data entry was made less tedious. These factors promoted the entry of complete textual records that any user could understand.

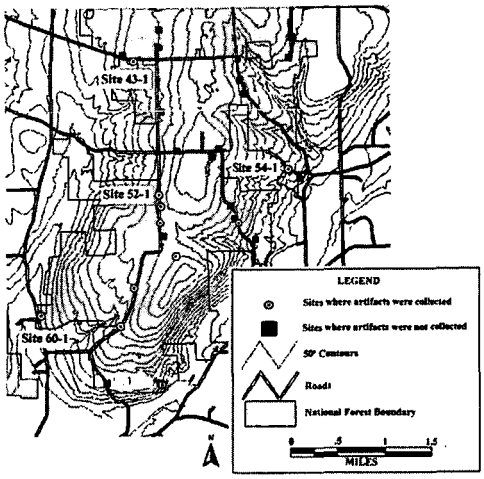


Figure 1. Map depicting the Burnt Hill Study Area of the Finger Lakes National Forest, with the location of sites where artifacts were collected. Sites referred to in the text are labeled by site number.

In order for this catalog to be incorporated in the GIS, provenience information was also included in the database. The spatial origin for each surface collected artifact was entered into the fields "site" (with corresponding X and Y coordinates derived from the GPS location of the site), and "feature" (referring to the proximity of artifacts to individual features identified on the AutoCAD drawing of the site from which the artifact was collected). Artifacts from test excavations were additionally recorded by "locus" (excavation unit) and "level." The box number for each artifact was recorded for accessioning purposes.

The last field for each record, "photo," establishes a link to a digital photograph, or in some cases line drawing, of the corresponding artifact (Cuddy and Thomas 1998). Artifacts were photographed in lots grouped according to the class of artifact and feature where they were located. However, each record is linked to the image, which contains the corresponding object. These images were incorporated into the database as a reference source, but cannot be analyzed by any of the more sophisticated functions of ArcView. The images are readily accessible within the database, eliminating the need for access to, or unnecessary handling of, the actual objects.

Figure 2 models the organization of artifact data within the GIS, and displays the relationships between site provenience information (GPS coordinates), features depicted in individual site plans (AutoCAD drawings), descriptive information in the artifact database, and digitized images of the actual artifacts. Each artifact is coded with the UTM coordinates of the site from which it was collected, allowing for queries of the artifact table to be generated at the regional scale in ArcView. Additionally, a table of the artifacts from each site is hot-linked to the site location, allowing for the instant generation of an artifact list from any site where materials were collected. Because the feature from which any artifact originated is recorded in the database, more specific provenience information is readily accessible by reference to the site plan. The organization of the artifact data in this way allows for the material culture to be analyzed at a number of scales, and the resulting immediacy of access to different classes of information facilitates interpretation and comparison.

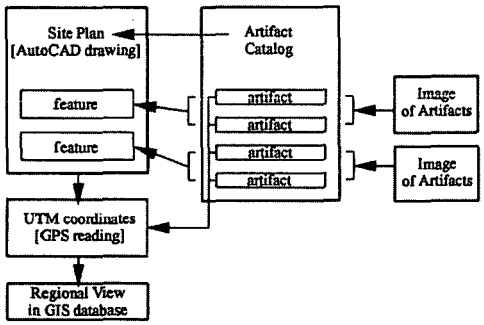
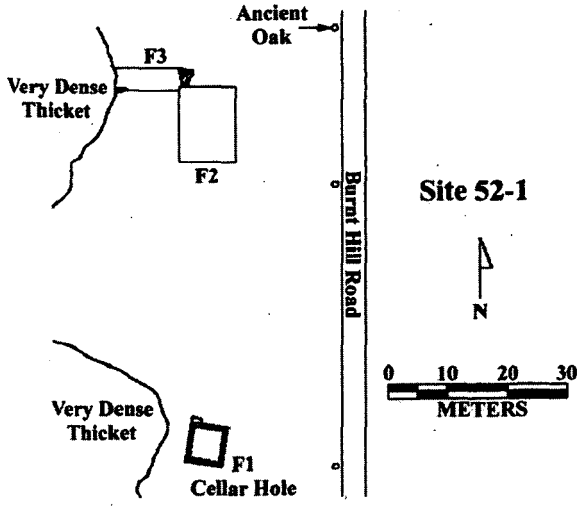
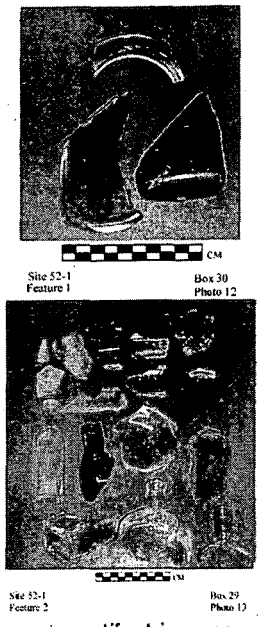


Figure 2. Schematic diagram modeling the relationship of artifact data, site plans, and provenience information in the project's GIS database.

Figure 3 depicts the constituent elements of the database described above using the example of Site 52-1. The site plan (FIG. 3a) indicates the arrangement of the various architectural features (the location of Site 52-1 is identified in FIG. 1). The artifact table describes the materials collected from the site (FIG. 3b) and includes reference to the feature (e.g., F1, F2) where each object was located. The digital images of artifacts (FIG. 3c) serve as a reference source enabling immediate visual examination



a. site plan



c. artifact images

SITE	FEATURE	LOCUS	LEVEL	BOX	CLASS	TYPE	VARIETY	FORM	MANUFACTUR	HALLMARK	DATE_RANGE	GLAZE	BODY_DECOR	RIM_DECORA	PHOTO
52-1	F1		surface	30	glass	bottle	amber	liquour	machine made	bottom encircled 'S'	1880-present				52-1-12.tif
52-1	F1		surface	30	glass	bottle	clear	unk	misc molded						52-1-12.tif
52-1	F1		surface	30	glass	container	clear	unk	misc molded						52-1-12.tif
52-1	F1		surface	31	ceramic	refined e-ware	whiteware	unk			1844-1860	lead glaze	Flow Blue		
52-1	F1		surface	31	ceramic	refined e-ware	whiteware	unk			1844-1860	lead glaze	Flow Blue		
52-1	F2		surface	29	glass	bottle	clear blue	med bti	machine made	Fairport, NY Liniment or Oil of Life, C.C. Taylor	1900-present				52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear blue	other	mold blown	"warranted"	prior-1860				52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk							52-1-13.tif
52-1	F2		surface	29	glass	bottle	pink	unk							52-1-13.tif
52-1	F2		surface	29	glass	bottle	pink	other							52-1-13.tif
52-1	F2		surface	29	glass	bottle	pink	other	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk	mold blown						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	pressed glass	pink	bowl	misc mold						52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	machine made		1900-present				52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	unk							52-1-13.tif
52-1	F2		surface	29	glass	bottle	clear	med bti	misc mold	G.H.R. on bottom, (PA)N King on side					52-1-13.tif
52-1	F2		surface	29	glass	bottle	amber	liquour	misc mold		1860-1880				52-1-13.tif

b. artifact table

Figure 3. Example of a) a site plan, b) artifact table, and c)artifact images from the GIS database.

of the materials on the computer screen. This organization of formerly separate and static forms of evidence within the GIS resulted in an integrated, comprehensive, and spatially referenced archive of archaeological data.

The framework established for incorporating artifact data in the Finger Lakes National Forest Archaeology Project GIS was intentionally designed to accommodate the inclusion of results from future survey and excavation projects. The following discussion-demonstrates some of ArcView's analytical capabilities for querying the database. The authors recognize that the expansion of this data set by future projects in the forest will strengthen the analytical potential of these queries. The artifact assemblages from three sites in the study area are then described in more detail. The preliminary interpretations of these assemblages indicate the rich potential for archaeological research in the Finger Lakes National Forest.

Using GIS to Analyze the Artifact Assemblage

A total sample of 1,167 artifacts were recovered and catalogued from 11 sites (FIG. 1) in the Burnt Hill Study Area. The surface collections from 10 sites in this sample account for ~23% (n=256) of the total assemblage, while the more intensive collection and test excavations at Site 60-1 resulted in ~77% (n=911) of the total assemblage. The small total sample size and unequal distribution of materials recovered from these sites are important considerations for the analysis of this total assemblage.

The identification and analysis of these materials (Six 1999) was based on the standard literature on the history, manufacturing techniques, forms, and decorative styles of common historic period artifacts (e.g., Beaudry et al. 1983; Brown 1982; Busch 1981; Jones & Sullivan 1989; Majewski & O'Brien 1987; Miller 1980; Miller and Hunter 1990; Miller & Sullivan 1984; Nelson 1968; Noël Hume 1970). The process of cataloging the assemblage revealed tremendous diversity in the types, forms, and styles of artifacts collected from the study area. The limitations imposed by the size and distribution of our sample preclude a rigorous analysis of this diversity; nevertheless, the organization of the data in a GIS allows for numerous manipulations of the available data. A few examples of ArcView's analytical functions are provided in order to demonstrate the potential of GIS for archaeological research.

The Ceramic Assemblage

Ceramic artifacts accounted for ~18% (n=216) of the material culture in our sample. The history of 19th-century ceramic manufacturing techniques and decorative styles is well established in historical archaeology (e.g., Brown 1982; Majewski & O'Brien 1987). As a result, ceramics can serve as relatively sensitive temporal and socio-economic indicators of purchasing and consumption practices. When identifiable manufacturer's hallmarks were present in our ceramic assemblage more specific date ranges could be determined for the objects. Due to these factors, ceramics were chosen to demonstrate some of ArcView's analytical capabilities for querying and sorting the artifact database.

Even the most basic querying functions in GIS can be very useful to historical archaeologists. The contents of any field (e.g., class, type, form) in the artifact database can be quickly searched for the presence of any category or label. Furthermore, the results of this search can be instantly displayed as an easily readable map displaying the presence or absence of a given artifact characteristic at the collected sites. Figure 4 displays the results of this kind of search. ArcView's Query Builder function (see inset in FIG. 4) permits the generation of simple Boolean expressions, in this case [Body_decor] = "transfer print." ArcView then searches the database for records which match this expression; the results of this search can be viewed graphically. Those sites where transfer printed ceramics were collected are immediately distinguishable from sites where such artifacts were not present (FIG. 4). While this example is quite basic, it demonstrates the utility of the GIS database. Similar expressions can be constructed using any of the fields and labels in the database, including combinations of more than one field. A more complex example is provided below.

Identification of date ranges for the ceramic assemblage was based on distinctive "varieties" (e.g., yellow-ware, ca. 1827–1922), "body decoration" (e.g., Flow Blue, ca. 1844–1860), or the presence of a manufacturer's "hallmark" (e.g., McNichol China, Clarkesburg, WV, ca. 1930–1954). Many of the sherds could not be dated beyond the broad ranges attributed to common ceramic types. Plain gray stoneware sherds without distinctive decorative styles or hallmarks, for instance, could not be dated more exactly than ca. 1775–1900. The authors assume that these ceramics are 19th century in origin, but more exact dates could not be attributed to them. For other ceramics, such as brown stoneware sherds, dates could not be attributed more exactly than a terminus post quem, in this case post-1820. These limitations are inherent in the available data, and are familiar to most historical archaeologists.

The calculation of a mean ceramic date (South 1977) for the whole assemblage resulted in a mean of 1870 (Six 1999). This date

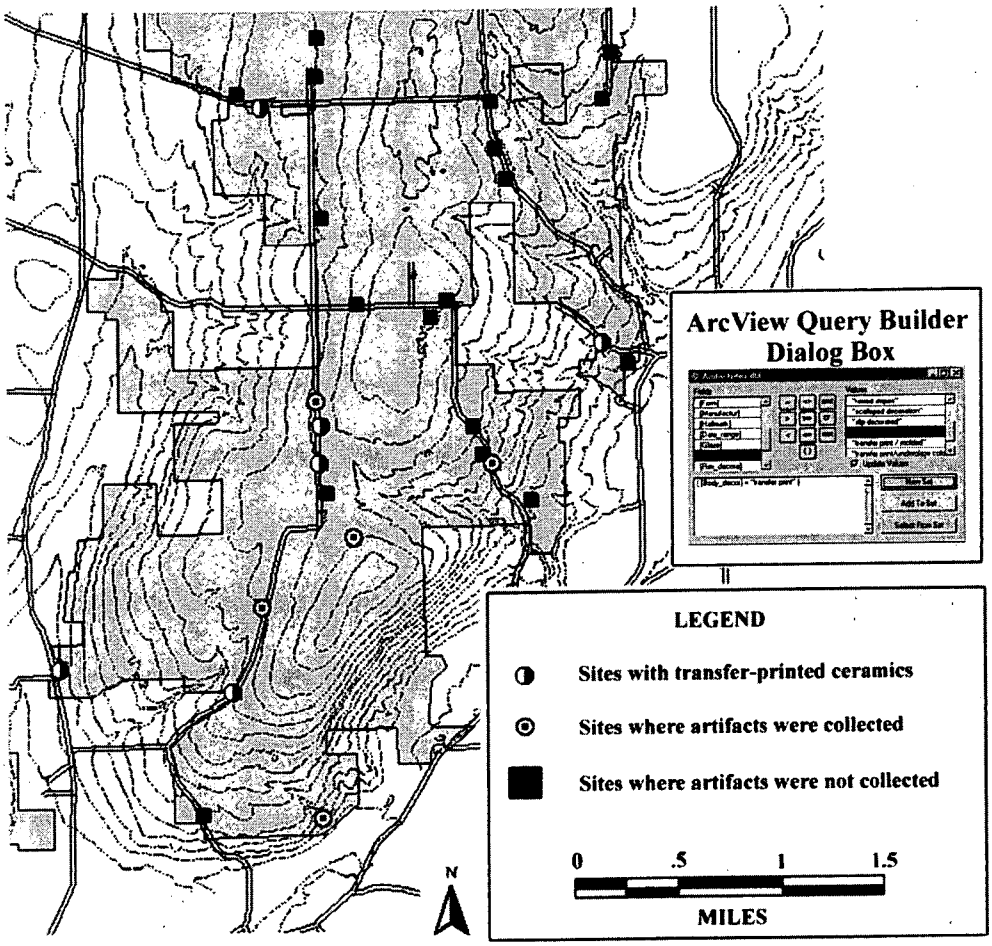


Figure 4. Example of the Query Builder function in ArcView; this map indicates the presence or absence of transfer-printed ceramics at sites within the study area.

is somewhat early considering the general settlement history of the study area, but could indicate that the use of middle- and late-19th-century ceramics persisted in the study area through the early-20th century. Alternately, this date could reflect the disposal of older ceramics at the time the sites were abandoned, while more modern household vessels were taken with the tenants to their new homes. However, this calculation of a mean ceramic date masks the complexity of the artifact assemblages from Burnt Hill. Almost 58% of the ceramics (n=118) came from one site (Site 60-1), thus heavily biasing the whole assemblage. Moreover, the ceramic assemblages from different sites were often dramatically different from each other, suggesting that the variability between sites may be more informative than a consideration of the assemblage as a whole.

ArcView's analytical functions enabled a more careful consideration of the date ranges of ceramics from different sites. The ceramic set from the artifact catalog was sorted by site and the distribution of ceramic production dates for the sherds recovered from each site was calculated and charted (FIG. 5). These relatively simple distributions allow for a more refined analysis of the temporal variability present in the ceramic assemblages from different sites in the study area. Site 54-1 (n=33) and Site 60-1 (n=118) had the two largest

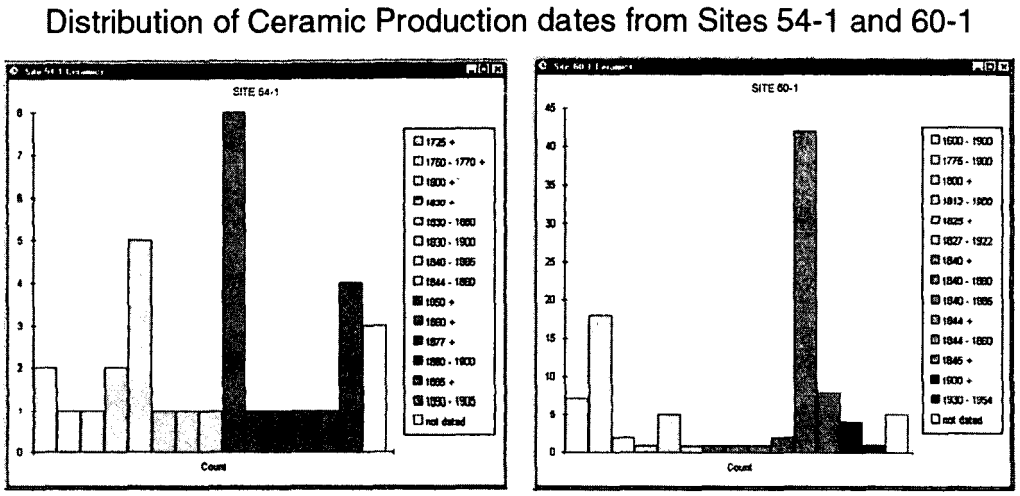


Figure 5. Summarized production date ranges from ceramics collected at two sites in the study area.

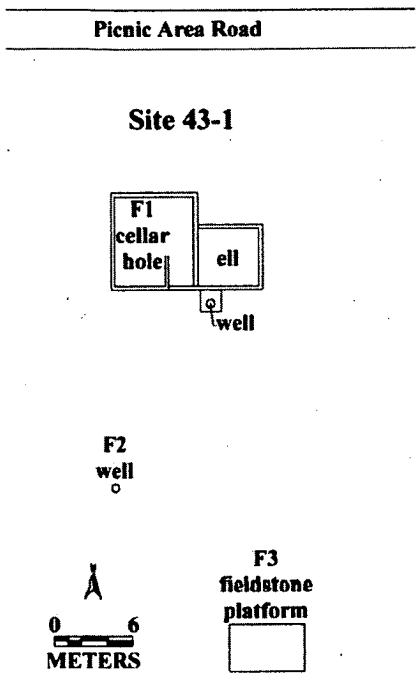
ceramic assemblages from the total population of collected sites. The distribution of ceramic date ranges from these two sites are provided as examples in Figure 5. The ceramic assemblages from the other nine sets are not included as the number of ceramic artifacts from each site was less than 20. These small sample sizes resulted in less informative distributions.

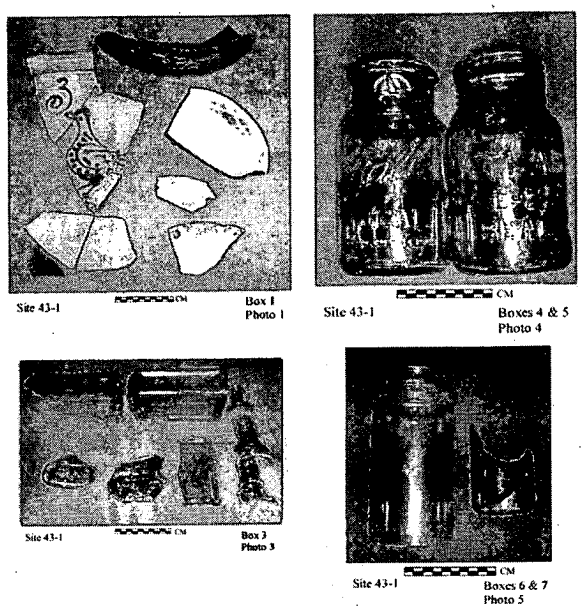
The majority (n=16) of the datable ceramic sherds from Site 54-1 were manufactured after 1850 (indicated by dark gray on the chart from Site 54-1, in FIG. 5). The earlier (light gray) ceramics represent various stonewares, and are assumed to be 19th century in origin, given the history of the study area. Ceramics with an early- to middle-19th-century terminus post quem (n=10; medium gray) also comprised a significant portion of the assemblage. Given the deposition of the surface scatters, and the broad date ranges attributed to most of the ceramics, this assemblage is likely from the latter periods of the site's occupation. The distribution of date ranges from Site 60-1 is relatively similar. Again the earlier ceramics are primarily stonewares (indicated by light gray on the chart from Site 60-1, in FIG. 5). The majority of the ceramics (n=55; dark gray) have an earliest production date in the middle-19th century. Five of the artifacts were positively identified as being 20th century in origin (represented in black). This assemblage is also consistent with an early-20th century deposition of the artifacts.

These examples demonstrate how GIS can be used to analyze an artifact assemblage. The significance of GIS in these examples is the speed and ease with which patterns in the data can be identified and investigated. The organization of data in a GIS permits the almost instantaneous generation of such analyses by even a minimally proficient user of the software. The various analytical functions of GIS can be used to quickly and easily create hypotheses, test them against the data, and design research questions for future projects. The authors hope that the method used in this project to integrate artifact data in a GIS will encourage experimentation with the software by other historical archaeologists.

Interpretations of the Artifact Assemblage from the Burnt Hill Study Area

As is typical of archaeological sites, some of the sites in the Burnt Hill Study Area surface collection sample had more artifacts than others. The recovered assemblages from three of the eleven collected sites were selected for further discussion based on two criteria: the relative abundance of material recovered from the sites, and/or the presence of accurately datable evidence, such as identifiable manufacturer's hallmarks. Following a cursory description of the assemblages from each of these three sites, historic evidence obtained





a.site plan b. artifact images

Figure 6. The site plan a) from Site 43-1, and b)digital photographs of artifacts collected from the site.

from other parts of the GIS database is considered in order to establish a more detailed context in which to interpret the assemblages. Historic map data and historic property ownership data discussed in previous articles provided important information that allowed the artifact data to be better understood. The immediate access provided by the database to these forms of evidence facilitated these preliminary interpretations of the artifact assemblage. The ease with which these sources could be consulted demonstrates the powerful integrative potential of GIS databases for historical archaeology.

Site 43-1

The artifact assemblage recovered from Site 43-1 is fairly typical of the surface scatters associated with historic farmstead sites in the Burnt Hill Study Area. A total of 40 artifacts (30 glass objects, 9 ceramic, and 1 lump of coal) were collected and cataloged from this site. Three extant architectural features were documented at the site (FIG. 6a): a stone-lined cellar hole with an ell (F1); a well located in the yard area behind the cellar hole (F2); and a field stone platform (F3) representing the foundation of a small outbuilding. Artifacts were recovered from surface scatters in the yard areas surrounding the cellar hole and outbuilding foundation.

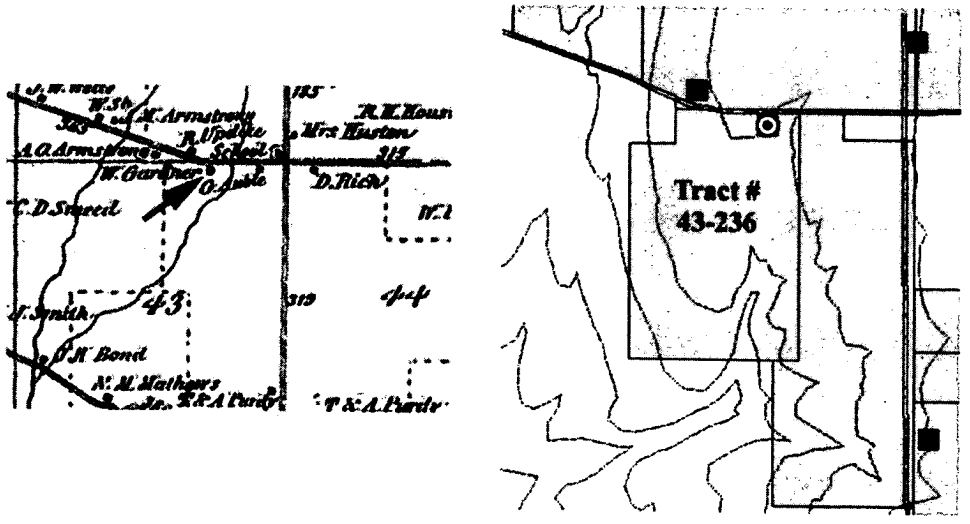
Most of the surface debris collected from this site was dated to the late-19th and early-20th centuries. Twenty-five of the glass artifacts provide clear evidence of machine manufacturing, a technique that was not in use prior to the 1880s (see Jones & Sullivan 1989: 35–39; Miller & Sullivan 1984), and came to dominate the glass industry by the 1920s (Busch 1987: 73). Many of the glass objects also bore readily identifiable trademarks (FIG. 6b), such as PEPSODENT ANTISEPTIC (ca. 1900), FRENCH'S MUSTARD, ATLAS GLASS CO., WASHINGTON, PA (ca. 1896–1965), BALL BROS. GLASS (ca. 1887–1973), and medicine bottles extolling the virtues of long forgotten nostrums such as

PORTERS PAIN KING (ca. 1880) and the enigmatic 3/IN/ONE/OIL. Analysis of the ceramic sherds provided a corresponding range of dates. Three pieces of coarse, salt-glazed, white stoneware with a hand painted decorative design in cobalt (ca. 1870–1920), and the base portion of a lead glazed, ironstone bowl bearing the hallmark of HOMER LAUGHLIN CHINA CO., EAST LIVERPOOL, OH (ca. 1877), further indicate that this assemblage originated from the latter periods of the site's occupation.

Historic property ownership information from this farmstead (refer also to Wehner and Holmberg, this volume, FIG. 3) was consulted to generate a context for interpreting the material assemblage. The first recorded transaction for the property details the sale of a 75-acre farm by John and Louisa Kelly to William Gardener in 1861, whose residence is indicated on an 1874 map of the region (FIG. 7). The farmstead changed owners five times between 1861 and 1921, but maintained the same size and configuration through 1940 (FIG. 7b) when Charles and Mary Blanchard sold the property to the government.

Comparison of the property values for this tract from 1870 to 1940 with the average property value assessments for the study area indicate that the land values of this farmstead were slightly below, or equivalent to, the average value of local farms throughout the period. The last occupants of the farm, Charles and Mary Blanchard, purchased the farm in 1921 from James Carman. In order to acquire the farm, the Blanchards entered into a mortgage for the full value of the property ($1300) with the previous owner. This mortgage was not discharged until 1939, when it was paid off by the Soil Conservation Service as a component of their acquisition of the property. The government's assessments of the property in 1940 indicate that the farm was being operated by the owner, with 55 acres of cropland (valued at $10/acre) and 20 acres in forest or timber lots. This assessment includes an inventory of property improvements, which lists an eight room house with an ell and addition in "poor condition" (assumed to be F1 in the site plan), two wells, a wood shed and garage (also in poor condition), a hen house (fair condition), a smokehouse (poor condition), and two barns, one with an addition (in poor and very poor condition).

The information from these historic sources provides a more detailed context in which the small sample of material culture from the site can be interpreted. The map and



a. 1874 map b. Tract #43-236 in the GIS database

Figure 7. Historic data from the GIS database related to Site 43-1. a) an 1874 map identifies the residence of W. Gardner on Tract # 43-236, b) the 75-acre farm. .

property ownership data suggest a continuous occupation of the site from at least the mid-1850s through 1940. The date ranges from the artifact assemblage indicate that the recovered surface debris dates to the more recent span of this occupation; the deposition of the surface scatters, suggestive of refuse disposal associated with the site's abandonment, also supports this assumption. All of the vessel fragments recovered, both ceramic and glass, are utilitarian in nature (e.g., canning jars, jugs, bowls, and bottles), and are typical of a domestic habitation. There is an absence of typical high-status markers (e.g., porcelain, imported goods, or ornamental pressed glass objects) from the site. Coupled with the relatively low land values obtained from historic records, the material assemblage from Site 43-1 indicates the general poverty typical of the region in the early-20th century.

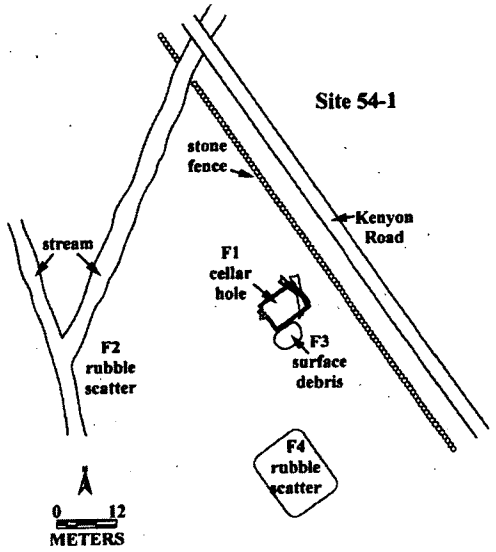


Figure 8. The site plan from Site 54-1.

Site 54-1

Site 54-1 is another typical domestic site in the study area. The site occupies a terrace on the relatively steep eastern slope of Burnt Hill (FIG. 1), between Kenyon Road and a small stream, and consists of four features (FIG. 8). Feature 1, a house foundation, is a stone lined cellar hole. Feature 2, a collection of rubble likely indicating a small outbuilding, is located on the banks of the stream, southwest of the house foundation. Feature 3 is a small sheet of scattered debris adjacent to the cellar hole. Feature 4 is a considerably larger rubble scatter, and may represent the remains of a demolished outbuilding or barn.

Seventy-six artifacts were collected and catalogued from the site (FIG. 9). Of the 43 glass artifacts recovered, 26 were identified as being machine manufactured (produced after 1880) and 6 were classified as being mold-blown (ca. early- to middle-19th century; Jones & Sullivan 1989: 26). Among the other 11 "miscellaneous-molded" glass artifacts from the site, three were readily datable: one artifact bore the distinctive three-seamed stamp of a Ricketts-type mold (ca. 1877 to the 1920s; Jones & Sullivan 1989: 47); a piece of milk glass, or opaque white glass (ca. late-19th century; Jones & Sullivan 1989: 14); and a "wax-sealer" type canning jar (early- and middle-19th century; Jones & Sullivan 1989: 164). The identification of a machine-made glass insulator (FIG. 9) indicates the possible use of electricity at Site 54-1, an immediate reminder of the relatively recent abandonment of these sites.

Almost 20% (n=6) of the 33 ceramic artifacts recovered from the site bore identifiable "maker's marks." One fragment of an ironstone bowl bears an identical hallmark as a sherd from Site 43-1, HOMER LAUGHLIN (ca. 1877). Two sherds were recovered of another ironstone bowl boasting the misnomer, manufactured by KNOWLS, TAYLOR & KNOWLS, EAST LIVERPOOL, OH (ca. 1890–1905). The ceramic assemblage also furnishes evidence for access to imported goods; one sherd bears the inscription MADE IN GERMANY and two pieces of a porcelain figurine are marked MADE IN JAPAN. Additionally, eight sherds of an elaborately decorated stoneware jar were recovered. The exterior of this jar is molded and hand-painted with a cobalt design, the interior is lead-glazed over a bright blue slip. Five pieces of transfer printed whiteware, including one sherd of Flow Blue, also date to the middle- and late-19th century. The diverse range of styles and dates attributed to the assemblage indicate a broader temporal span than at Site 43-1, beginning in the early- to middle-19th

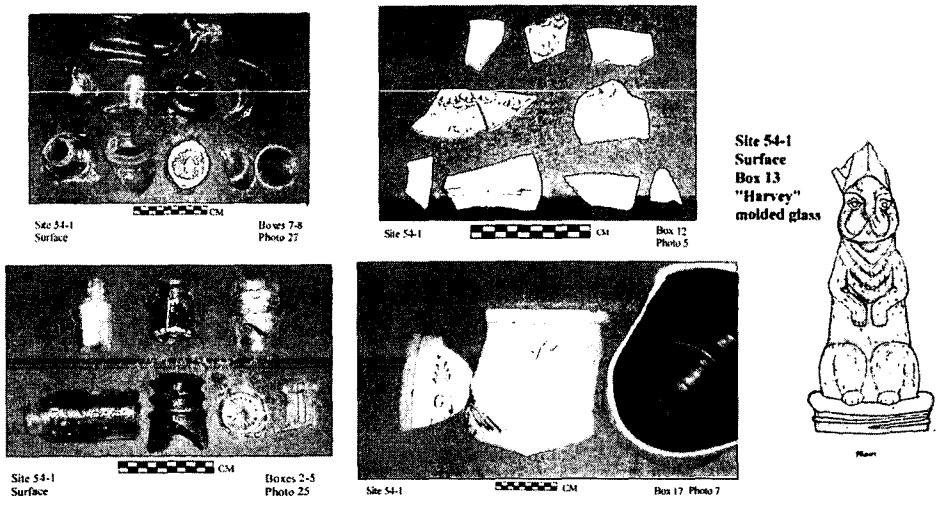


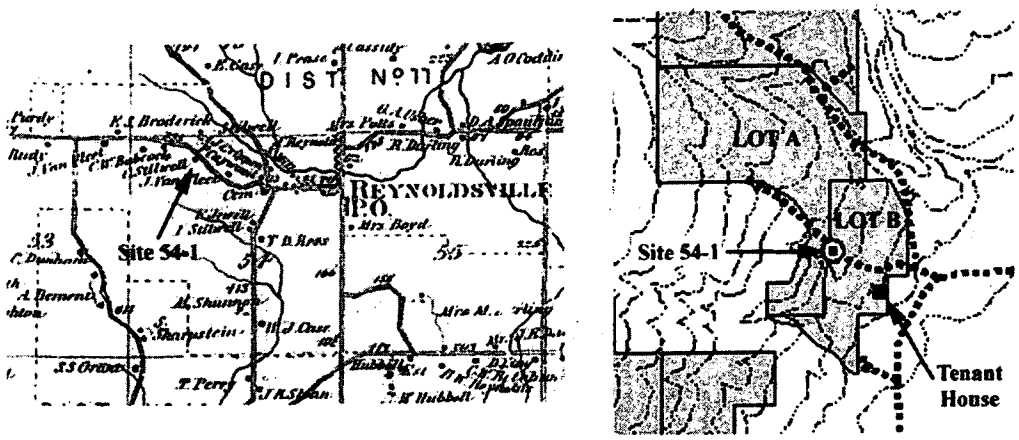
Figure 9. Digital photographs and illustration of selected artifacts collected from Site 54-1 (illustration by Noah Thomas).

century and extending to the period of abandonment.

Kenyon Road appears on the earliest (ca. 1850s) maps of the region, and connected the highland farms of Burnt Hill to the nearby village of Reynoldsville (FIG. 10a). Site 54-1 is located on an irregularly shaped 139-acre property (designated Tract # 54-270 in the project database; FIG. 10b), sold to the government by Charles and Fannie Kinyoun in 1941. This tract occupies a relatively steep slope of Burnt Hill, and is drained by two streams. The appraisal report of property improvements (ca. 1940) for this site describe a five room house in poor condition (F1 in FIG. 8), and a well, wood shed (fair condition), barn (very poor condition), and hog house (fair condition) on the property. The property records from Tract #54-270 are some of the most detailed, and complicated, of the files in the Hector Ranger Station. A brief summary of the archival record from this property provides a rich context for interpreting the artifact assemblage.

The Kinyoun's inherited the 4.5-acre lot surrounding the residence in 1924 from Fannie's mother, Mary Abel. Ms. Abel had begun buying up pieces of the tract in 1901, and the Kinyouns began purchasing additional parcels in 1919. Prior to this family's accumulation of the tract, the property had been sub-divided into 13 parcels ranging in size from .25 to 69 acres. These various parcels changed hands over 20 times between 1847 and the beginning of Mary Abel's consolidation of the tract in 1901. Many of the participants in these numerous transactions can be identified as residents or home owners in Reynoldsville on the 1857 and 1874 maps of the region. Brief references in the archival data from this tract suggest that during the 19th century the owners of these various lots, mostly village residents, used their small plots on the hill for cropland and timber for personal use.

The archival data from the early-20th century, during Mary Abel's and the Kinyoun's involvement with the property, provides some important contextual information. Between 1901 and 1924, Mary Abel occupied the lot (LOT A in FIG. 10b) containing Site 54-1, and her son-in-law Charles Kinyoun farmed the land on her property. Eliza Hubbel owned the adjacent 73.5-acre lot (LOT B in FIG. 10b) until 1920, when it was purchased by John Barber and Elton Lane for $2500. Between 1920 and 1923 Barber and Lane clear cut the entire parcel and sold the timber, then sold the parcel to Charles Kinyoun for $1.00. This parcel (LOT B) contained a rented tenant house throughout



a. 1874 map

b. Tract #54-270 in 1920

Figure 10. Historic data from the GIS database related to Site 54-1. A) An 1874 map depicts the location of Site 54-1, identified as the residence of C. Stillwell who owned the property from 1847 through 1879. B) The site was located in Tract #54-270, where the remains of a burned tenant house were also identified.

these transactions. After 1923 the tenants paid rent to the Kinyouns until 1928 when the tenant house burned (the tenant house was identified during the project survey, and is located southeast of Site 54-1; see FIG. 10b). The Kinyouns remained in residence at Site 54-1 until 1941.

Like Site 43-1, the material culture from Site 54-1 is consistent with a domestic habitation. Although the date ranges of the material culture include the early-19th century, the presence of early-20th-century artifacts in the surface scatters suggest an association with the final occupants of the site, Charles and Fannie Kinyoun. The presence of an electrical insulator may be explained by the proximity of the site to the nearby village of Reynoldsville. Moreover, the use of electricity suggests a slightly higher affluence for the residents of the site than other households in the study area. Both the material and documentary records from this site support this interpretation. The assemblage is characterized by a number of imported items, and a relative abundance of elaborately decorated objects, such as several optically-molded toiletry bottles, the ceramics, and a fancifully molded rabbit-shaped jar of indiscernible utility, which we nicknamed "Harvey" (FIG. 9; Six 1999). The Kinyouns may have had somewhat more discretionary income than many of their neighbors, suggested by their role as landlords during the 1920s. While the assemblage from this site is far from "rich," or indicative of elite status, it does demonstrate that some limited variability in wealth may be identified at these sites.

Site 60-1

The material record from Site 60-1 stands out in sharp contrast from the farmstead layouts and surface scatters typical of other sites in the National Forest. During the initial survey of the site, large quantities of glass vessels were apparent in the yard areas surrounding architectural features. A possible explanation for this abundance was provided when a contraption composed of metal tubing, wire mesh, and a galvanized tub was located in the underbrush. The identification of this contraption as a still resulted in an intense program of surface collection and limited excavation at the site. The purpose of this more intensive data collection was to examine the possibility that Site 60-1 represents that curious institution of early-20th-century America, the speakeasy.

The site is situated east of Logan Road, atop a relatively steep bluff. The lane which connected the site to the road could not be identified in the surrounding landscape. The site plan from Site 60-1 (FIG. 11) identifies the

location of five features. Feature 1 is a large cellar hole with additions to the east and north. Five 1 × 1 meter test excavation units were placed in and around these additions. A capped well (F2) is located several meters east of the cellar; this well is covered by a large, flat piece of stone with a small rectangular hole where a hand pump was once seated. Next to this well are the remains of the still (FIG. 12). Feature 3 is a large surface scatter southeast of the house foundation. A circular stone-lined well (F4) is located in the yard area behind the house. Feature 5 is a stone platform representing the foundation of a small outbuilding. This platform was covered in glass and ceramic vessels.

The total assemblage from test excavations and intensive surface collection at the site consisted of 911 objects (see FIG. 13 for selected examples). About 66% (n=604) of these objects were glass, mostly broken or intact utilitarian glass vessels. These vessels were surface collected from the debris scatter south of the house (F3), the area surrounding the still (F2), and the foundation of the small outbuilding (F5); several complete bottles were recovered in situ from Feature 5 during the course of our test excavations. Ninety-three beer-type bottles of green or amber glass were recovered, all but three of which were positively identified as machine made. Several of the green beer bottles bore identifiable manufacturer's hallmarks denoting their place of origin, such as C. KRUEGER CO., NEWARK, NJ (ca. 1900) and LANG'S, BUFFALO, NY (ca. 1900). Forty-two canning jars were collected from the site, 23 of which were positively identified as being machine made. Additionally, eleven soda-type bottles and nine liquor-type bottles were recovered. The numerous fragments of glass containers could not all be attributed to a specific type or form of vessel. The vast majority of glass containers date between 1900 and 1940, but the somewhat earlier molded vessels are likely present at the site due to the widespread practice of bottle reuse and recycling in the early-20th century. The use of recycled bottles was particularly prevalent among bootleggers (Busch 1987).

In addition to the profusion of utilitarian glass containers, a number of pressed-glass artifacts of a more decorative nature were recovered on the surface or in excavation units in the addition east of the cellar hole (F1). Several fragments of a small "candy" dish of pink pressed-glass were found in these excavations along with pieces of a green glass bowl. Both objects had been molded in an attempt to resemble costly, hand-cut crystal. Other pressed glass artifacts collected at the site include fragments of optically molded tumblers and the top bell-shaped portion of a "goblet" style drinking glass. The glass assemblage also included 12 medicine bottles, all

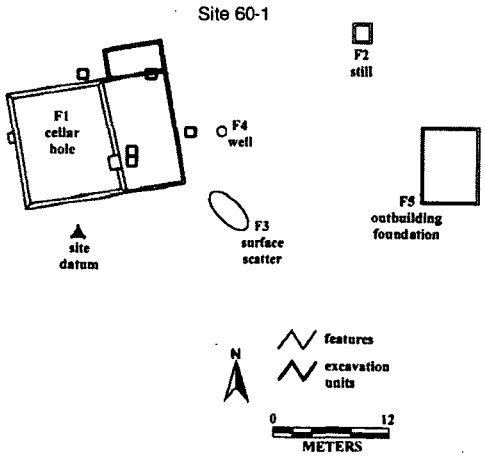


Figure 11. The site plan from Site 60-1; the locations of test excavation units are indicated.

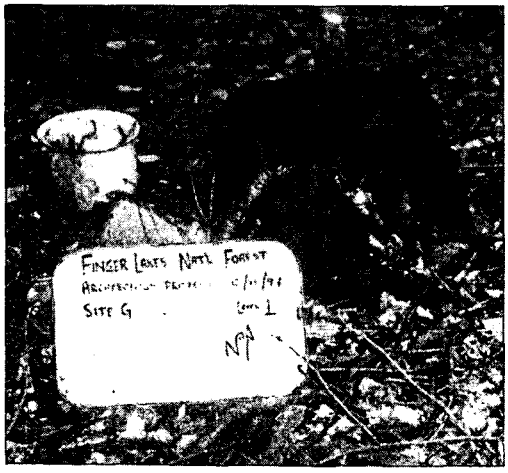


Figure 12. Remains of the still from Site 60-1 (Photograph by James Delle).

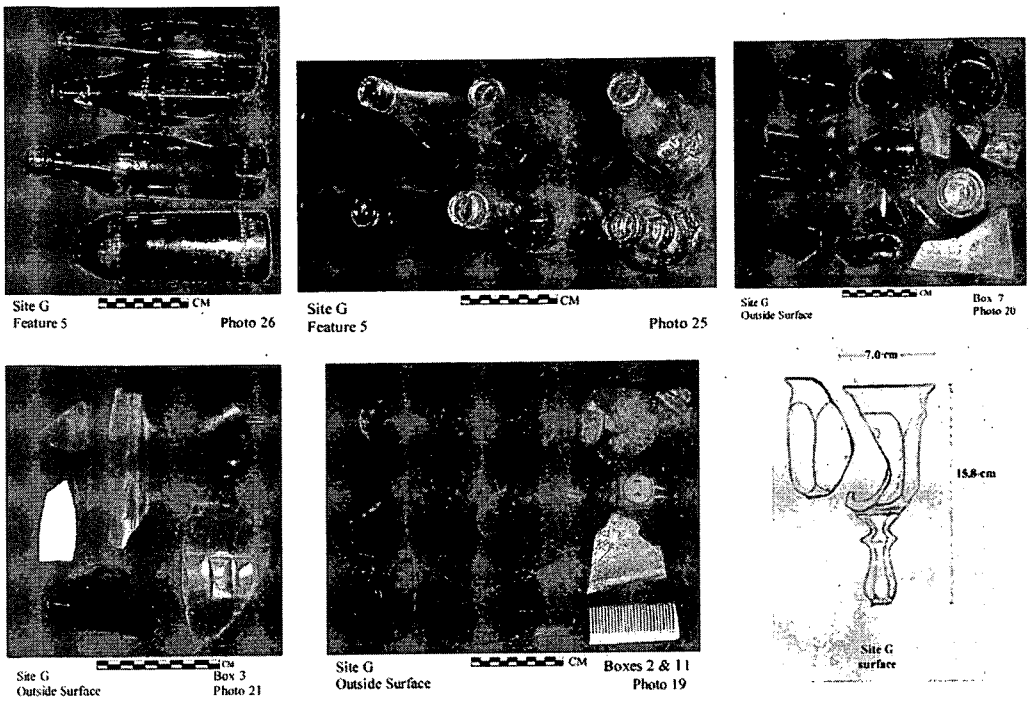


Figure 13. Digital photographs and illustration of selected artifacts recovered from Site 60-1 (illustration by Noah Thomas).

machine made, and three toiletry jars, including a POND'S COLD CREAM jar made of milk glass.

Metal artifacts (n=128) were the second most plentiful class of artifacts recovered, the majority of which were nails. Unfortunately, due to the dampness of the region and the natural process of oxidization, their method of manufacture was not readily ascertained. Of the 118 ceramic sherds from the site, nearly half (n=55) were some variety of refined earthenware. The earthenwares included 43 sherds of whiteware, 10 sherds of ironstone, a piece of yellow-ware, and one sherd of Rockingham. Only one identifiable hallmark is present in the entire ceramic assemblage, a sherd of a whiteware plate produced by MCNICHOL CHINA, CLARKESBURG, W.V. (ca. 1930). Fifty-five sherds of stoneware, mostly pieces of jugs or crocks, were found at the site, along with eight pieces of porcelain. Due to the high-degree of breakage within this assemblage, the ceramics do not seem to represent a large number of domestic serving dishes. The large quantity of stoneware jugs and crocks were found with the utilitarian glass containers scattered on and around Feature 5.

A limited number of faunal remains were collected from the rubbish scatters, some of which bore striations resulting from hand-sawed butchering. An interesting anomaly at the site was the abundance of leather artifacts. The majority of these fragments could be identified by their distinct forms: the narrow, pointed-toe soles of women's shoes. A few pieces of the shoes' uppers were also located, and they resemble a common style of laced shoes or boots depicted in fashion illustrations from the turn of the 20th century (Six 1999). These leather fragments were found on the surface of the yard area immediately east of the house foundation.

Unlike Sites 43-1 and 54-1, the available historic information pertaining to Site 60-1 is conspicuously limited. The site was located on Tract #61-260, a 144-acre property sold to the United States in 1941 by Pearl Egan and G. Earl Egan (husband), Clifford and Christine Warren, and Mabel Warren. The Egans also

owned a 158-acre property (Tract #71-266) at the southern extent of the National Forest, which was sold to the government in 1940. Otherwise, the property ownership data only mentions that Eugene Fish purchased Tract #61-260 in 1913. There is no record of when this property changed hands, or if there were intermittent owners. The site appears on an 1874 map of the region, identified as the residence of R. Dusenbury, but is not indicated on the 1911 maps. The only record from the government's purchase of the tract is a survey map that depicts the property's boundaries and size. An appraisal of permanent improvements was not included in these records, which could indicate that the site was unoccupied by 1940.

Some type of activity that required the stockpiling and use of glass containers was occurring at this site, based on the remarkable quantities and concentration of utilitarian glass vessels. The early 20th-century origin of most of this material, coupled with the remains of a still behind the house, makes the nature of this activity relatively obvious. The presence of bootlegging on Burnt Hill is not surprising, and can be understood as a reasonable means of making a living during a time of considerable economic hardship. Site 60-1 seems to represent the location of an illegal bootlegging operation, and the bottles and jars likely served as "hooch" containers for the distribution of liquor.

By 1916, 23 of the 48 states had implemented anti-saloon laws and the production and sale of liquor became a federal offense with the ratification of the Eighteenth Amendment in 1919. Prohibition lasted until December of 1933, although the practice of bootlegging continues in the United States to the present. A Federal Alcohol Control administrator (cited in Busch 1987: 75) estimated that in 1934, one gallon of illicit liquor was produced in the nation for every legal gallon sold. Prohibition resulted in a decrease in the production of glass bottles, encouraging the reuse of old bottles by illegal distilling operations (Busch 1987). Given the date ranges of glass vessels recovered from Site 60-1, it is not possible to determine if liquor production ceased at the site in 1933.

Documentary verification for the production and consumption of illegal spirits at Site 60-1 was sought in local archival repositories. A search for references to all known owners and occupants of the property, and for legal records of prohibition-era bootlegging in the area, was conducted in the Schuyler County Court House, Watkin's Glen, NY and the Schuyler County Historical Society, Montour Falls, NY. While this search located some fascinating material on the local 19th-century prohibition movement, and turn of the century criminal activities of various kinds, no records relating to Site 60-1 were discovered. This lack of historical records does not diminish the archaeological case for bootlegging at the site. Indeed, the absence of recorded knowledge about these activities by local authorities might indicate that the illicit operation was a success. Project members also discussed the site with local informants; while none of these informants could verify our bootlegging hypothesis, they did express considerable interest in the possibility.

Although artifacts of a more domestic nature (e.g. ceramic serving wares) are relatively infrequent in this assemblage, they indicate that the site was used for more than liquor production and wholesale distribution. These artifacts could indicate that the house was inhabited during the bootlegging operation, although actual residence at the site cannot be proven from the historical record. Alternately, these more "domestic" objects may suggest that the operation's clientele was entertained on the premises. While the production of liquor is well supported at this site, the nature of its distribution and locale of its consumption remains unknown.

The production of beer, wine, and liquor was an important component of the 19th-century agricultural economy in the Finger Lakes region. Wine production remains an important local industry, and the vineyards along Seneca and Cayuga Lakes are popular tourist attractions. The archaeological evidence at Site 60-1 indicates that this aspect of the local economy did not disappear in the 1920s and 1930s, contrary to the prevailing legal ideology of the time. The distillation of liquor at Site 60-1 rep-

resents an alternative economic strategy in response to the hardships faced by most local farmers in the early-20th century.

Conclusion

The discussion of individual sites presented in this article reveals the utility of GIS databases for historical archaeology. Our survey barely scratched the surface at these sites, yet due to the wealth of historic information available in the GIS database, the small artifact assemblage from surface scatters proved to be an informative set of data. In this project, integrating diverse sources of information in one organizational framework made disparate classes of evidence readily available for comparison. The ability of the GIS to manage and integrate these different classes of data is perhaps the greatest strength of the software.

The limited sample of material culture recovered from 11 sites during the Finger Lakes National Forest Archaeology Project survey demonstrates the potential for continued archaeological research in the National Forest. The surface assemblages originated from the abandonment of the farmsteads ca. 1935–1941, and offer a general indication of household material culture from the later periods of occupation. Many of the farmstead sites appear to be largely undisturbed since their demolition, and determining the integrity of archaeological deposits will be an important aspect of future fieldwork in the Forest.

Incorporating the artifact catalog into the GIS database was intended to provide access to all recorded archeological and historical data within a single data management system. The artifact catalog, like the rest of the GIS database, was intentionally designed to be easy to use, and be able to generate immediate and meaningful analyses of the available data. This article provided a few relatively simple examples of GIS data analysis. These types of analyses are familiar to historical archaeologists and are widely practiced; what differentiates the examples provided herein is that GIS permits the data to be almost instantaneously sorted, queried, or summarized and the results to be distributed spatially. The speed and ease with which queries can be conducted serves as a reward for the time and energy spent constructing the database.

Our GIS database serves not only to integrate the data from the present survey project, but provides an established framework for incorporating results from future projects. The recording system for artifact descriptions and provenience information is flexible and user-friendly. These attributes should permit both the use and expansion of the database by future National Forest Service and/or CRM personnel in subsequent projects in the forest. The authors hope that the framework for data management described in this article will benefit future archaeological research in the Finger Lakes National Forest, and prompt experimentation with GIS by other historical archaeologists working on similar types of projects.

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