Northeast Historical Archaeology

Volume 47 *Northeast Historical Archaeology* Article 5

2018

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Cover Page Footnote

Acknowledgements: This project was possible because of the staff and volunteers of the citizen science program at the Smithsonian Environmental Research Center. Funding for the author's attendance of the CNEHA conference in 2015 to present on this research as part of the session "Domestic Life and its Environment" came from the Smithsonian Institution Grand Challenges Grant. The author would also like to recognize the work of the Archaeology in Annapolis 2014 and 2015 field schools, in which the author participated, for the field work at the Brown House Site. A special acknowledgement goes out to the other authors in this issue, the author's fellow volunteer researchers, for their dedication on this issue. Kiley Gilbert, Ray Sarnacki, and others who assisted in collecting data and transcribing censuses are sincerely thanked. Those who helped with comments and revisions are greatly appreciated, as well as Russel Miller for his support and patience.

Cultivating Historical Farms: A Study of Late Nineteenth-Century Maryland Farms

Sarah N. Janesko

This study examines late 19th-century farmsteads in Anne Arundel County, Maryland, to measure and explain changes in agriculture and the effect of farming strategies on the local landscape. Agricultural census data from 1850 to 1880 for the county's First Election District are used to measure significant changes in crop production after the Civil War. From this local-level analysis, one farmstead is analyzed to understand those agricultural changes at the household level. Results from exploratory statistics, two-sided independent-sample t-tests, and one-way analysis of variance tests demonstrate that mean production of tobacco, wheat, and corn decreased significantly in the decades after the Civil War. Evidence from archival and preliminary archaeological data at the Sellman House site (18NA1431) and the Brown House site (18AN1546) demonstrates that the Sellmans relied heavily on tobacco as their cash crop for market agriculture, while their tenant farmers practiced subsistence farming. Materials recovered from shovel tests around the Sellman House show a paucity of artifacts identified for agricultural use, while shovel testing around the Brown House recovered farm tools and fragments of canning jars and canning lids. These results provide a foundation from which to test new theories about correlations among domestic and agricultural spaces, land management strategies, and the environmental consequences of those strategies over generations of practice.

Cette étude examine les fermes de la fin du XIXe siècle dans le comté d'Anne Arundel, dans le Maryland, pour mesurer et expliquer les changements survenus dans l'agriculture et les effets des stratégies agricoles sur le paysage local. Les données du recensement agricole de 1850 à 1880 pour la première circonscription électorale du comté sont utilisées pour mesurer les changements significatifs de la production agricole après la guerre de Sécession. À partir de cette analyse au niveau local, une ferme est analysée pour comprendre ces changements agricoles au niveau des ménages. Les résultats des statistiques exploratoires, des tests t indépendants bilatéraux et des analyses de variance unidirectionnelles démontrent que la production moyenne de tabac, de blé et de maïs a diminué de manière significative dans les décennies qui ont suivi la guerre de Sécession. À partir des données d'archives et des données archéologiques préliminaires sur les sites de Sellman House (18NA1431) et de Brown House (18AN1546) montrent que les Sellman étaient fortement tributaires du tabac comme culture pour l'agriculture marchande, tandis que leurs fermiers exploitants pratiquaient une agriculture de subsistance. Les matériaux récupérés lors des sondages autour de la Sellman House révèlent une rareté d'artefacts identifiés pour une utilisation agricole, tandis que les sondages autour de la Brown House ont permis de récupérer des outils agricoles et des fragments de bocaux et de couvercles de conserves. Ces résultats fournissent une base pour tester de nouvelles théories sur les corrélations entre les espaces domestiques et agricoles, les stratégies de gestion des terres et les conséquences environnementales de ces stratégies sur des générations de pratiques.

Introduction

In this article, I use the statistical analysis of agricultural census data to measure changes in farm size, value, and crop production before and after the American Civil War. This study is set in the First Election District of Anne Arundel County, a southern Maryland county along the western shore of the Chesapeake Bay in the United States. Using census data from 1850 to 1880, I ran *t*-tests and analysis of variance (ANOVA) tests to determine significant changes in four crops: tobacco, wheat, corn, and oats. The results from my tests demonstrate that crop production in that district changed significantly after the Civil War. Use of census records in archaeological research is particularly salient when studying 19th-century agriculture in the United States. Archaeologists have the advantage of addressing two units of analysis simultaneously: the "local" context through archival datasets and the "household" experience through site-specific material culture analysis (De Cunzo 2001).

To further investigate the results of the statistical analysis, I examine one 19th-century farmstead in the First Election District (FIG. 1). This farmstead included the Sellman House, lived in by several generations of the Sellman family, and the Brown House, named after the last known tenants who lived there. Using census records and artifact catalogs from excavations at the Sellman House and Brown House sites, I discuss the implications of the Sellman family's farm strategy for the environment.

Agriculture, especially within the Chesapeake Bay watershed, affects the composition of soil, nutrients in nearby waterways, and erosional processes, all of which visibly change the landscape and the quality of resources (Jordan et al. 1997; Rick et al. 2016). Rural sites along Maryland shores of the Chesapeake Bay have been deforested and intensely farmed for centuries, which led to measurable soil loss (Geleta et al. 2014: 626, 629). This demonstrable change for Maryland farms was the result of constant use of the land for agriculture over several hundred years of European and European American occupation. This article aims to support and develop an agricultural context from which to further study the significant ways in which humans in the Chesapeake have altered their environments through farming practices.

Archaeological Farmstead Studies

Archaeological scholarship on farmsteads in the eastern U.S. largely depicts a steady decline of farming after the American Civil War and into the 20th century. Reasons for the decline of farming include loss of the labor force, poor soil quality, economic depression,

Figure 1. Map of the First Election District showing the location of the Sellman farmstead, then owned by Mrs. A. Sellman with inset of Anne Arundel County, Maryland. (Base Map, Martenet [1860]; inset Watershed Protection and Restoration Program [2018]; modified by Sarah N. Janesko, 2019.)

and increased competition from farmers in western states (Catts 2001; Groover 2008; Harris 1994; Heaton 2003; Wurst and Ridarsky 2014). This scholarship presents evidence from census records, land records, tax documents, geographic information systems (GIS), and archaeological surveys. The integration of multiple data sources provides a complex narrative of the changes that occurred after the Civil War and how those changes are reflected in the archaeological record.

In Wade Catts's (2001: 149) discussion of the importance of archaeological investigations of mid- to late 19th-century farmsteads, he states: "[T]he impact of the war on the agricultural landscape of the United States lasted far beyond the five years of combat." Catts describes the significant decline of improved acreage reported in the 1860–1880 censuses for Spotsylvania County, Virginia, pointing out the long-term effects of war on the landscape and on the population (Catts 2001). While rural areas that were directly involved in battle were the most visibly damaged by munitions, encampments, and abandonment, other farmsteads were affected by the significant loss of the male population due to death and disability after the war. In addition, states and businesses contributed significant economic investments to fight the war which were difficult to recover. The structure of large- and medium-sized plantations also changed, since, up until 1864, they relied upon the work of enslaved laborers. These impacts on farms can be seen in rural landscapes well beyond the end of the war.

In the Southeastern U.S. William Harris (1994) determined that crop choices changed significantly in Georgia's Piedmont region after the Civil War. He demonstrated significant increases in cotton production over food crops like corn and oats. He further analyzed whether race, tenancy, use of fertilizer, and wealth contributed to differences in crop choices. His study used census and tax data to compare the choices of farmers and tenants in three different counties in Georgia. Harris found that both upper and lower Piedmont regions demonstrated an increase in cotton production from 1860 to 1880. The primary factor affecting change in the upper Piedmont region was the use of fertilizer, whereas the factors affecting the lower Piedmont region also included race, tenure, and wealth of farm operators (Harris 1994). While both regions saw increases in cotton production after the Civil War, there was variation among local communities within that region due to differences in farm strategies and socioeconomic status.

In the Northeastern U.S. Patrick Heaton (2003) explored questions of change in tenancy, crop production, and longevity of farms near New York's Finger Lakes. He provided in-depth historical context for an archaeological project in the Finger Lakes National Forest using archival data from 1870 to 1940. A large tract of farms was surveyed by the government after it was purchased to form the national forest in 1935. The study used a GIS database to analyze the economic strategies employed by farmers in the area. In that locale, farmers purchased more land "in an attempt to alleviate and forestall their own poverty in the face of environmental degradation and regional economic decline" (Heaton 2003: 29). In the 1920s and 1930s farmers in the area struggled to overcome an agricultural depression. Some strategies available to farmers included investment in newer technology and equipment, acquisition of more land, an increase in the size of the labor force, or diversification of land use for crops, lumber, and pasture (Heaton 2003: 42–43). Since these options were heavily dependent on one another (more land requires more laborers and/or new equipment and capital for more seed, fertilizer, etc.), simply acquiring more land was not enough to save a farm. The farms were abandoned as the population decreased and farmers ultimately sold their land to the government (Heaton 2003).

Many farmers in central New York State switched from mainly wheat production to a more diverse farming strategy, especially in response to increased wheat production west

of the Mississippi in the 1860s (Towne and Rasmussen 1960: 261; Wurst and Ridarsky 2014: 230). This strategy of diversification was important for New York Finger Lakes farmers well into the 20th century as the government sought to evaluate land quality in order to implement New Deal programs in rural areas (Wurst and Ridarsky 2014). Despite the government's evaluation of many farms in the Finger Lakes as located on land inadequate for farming, LouAnn Wurst and Christine Ridarsky (2014: 230) provide archival and archaeological evidence demonstrating the opposite; farmers had adapted their strategies to maintain successful farms. The diversification of crops and incorporation of products from dairying, orchards, and livestock suggest that some farms successfully adapted to difficult economic conditions.

The strength of these archaeological studies of farmsteads is their use of both archival and archaeological datasets to examine effects of agricultural changes in the late 19th century on local communities and households. The narratives presented in these studies convey the economic, political, and social factors contributing to decreases in the number and size of farms. Many archaeological farmstead studies have not provided insight into the relationship farmers had with the land. There are few examples of farmstead studies analyzing whether farmers made decisions that were also based on (or in spite of) their understanding of the impact certain farm strategies had on the quality of the soil, water, crops, etc. (what today is referred to as the "environment"). I hope to situate the archival and archaeological data from the Sellman House site and the Brown House site within this scholarship and provide a basis with which to engage future archaeological studies through an environmental lens.

Agricultural Census Data

The sample population from the agricultural censuses was chosen specifically to provide a "local" context for the archaeological study of the Sellman farmstead. The First Election District was the boundary used by census enumerators, which included the Sellman farmstead. Census data from the two decades before and the two decades after the Civil War were chosen to test for significant changes in agriculture during that time. This sample population was thus suited to address the research question: what, if any, measurable changes in agricultural practices occurred in Anne Arundel County's First Election District from 1850 to 1880?

The sampled censuses record roughly 150–200 individual farms in each year and more than 40 variables for each farm (U.S. Bureau of the Census 1850a, 1860a, 1870a, and 1880a). In order to adequately compare results between census decades, the dataset was reduced to 22 variables that were the most consistently recorded in all four census years. Selected variables discussed in this article are shown in Table 1 and include, but are not limited to, improved and unimproved acres, cash value of the farm and equipment, crop yields, and number of livestock. The units of measure, and therefore the range of numeric values for each variable, differ greatly, and include dollars, pounds, bushels, acres, and individual counts (TAB. 1).

The agricultural census dataset is entirely quantitative, making it particularly suitable for statistical analysis. Using the statistical software R to run all calculations, I began the analysis by examining the minimum, medium, and maximum farm sizes and values in each of the census years. I identified and tracked outlying farms across the censuses to assess how the distribution of wealth and sizes of farms changed in each of the censuses. I then analyzed mean crop production within the sampled years through two-sided independent-sample *t*-tests and one-way ANOVAs. The *t*-tests were used to determine whether there was a significant change in mean production of each of the four main crops between 1860 and 1870. The one-way ANOVAs compared the degree to which the variances in mean production across all four census years changed.

Table 1. Summary statistics of selected variables for farms in the 1850–1880 agricultural census schedules (U.S. Bureau of the Census 1850a, 1860a, 1870a, 1880a).

Variable	Unit of Measure	Year	Mean	IQR*	Min	Median	Max	N
Corn	Bushels	1850	1,410.65	1,200	0	1,000	15,000	161
		1860	1,367.44	1,150	0	850	25,000	158
		1870	954.05	1,025	0	750	3,500	197
		1880	933.43	850	0	700	8,800	161
Farm value	Dollars	1850	8,770.69	6,500	0	6,000	75,000	161
		1860	13,277.82	13,143	150	10,000	112,000	158
		1870	8,337.40	7,160	300	6,050	39,000	197
		1880	7,346.42	6,500	200	5,500	40,000	161
Improved land	Acres	1850	206.32	140	0	150	2,000	161
		1860	194.80	121	5	161	2,000	158
		1870	168.32	115	6	150	750	197
		1880	132.80	90	3	120	440	161
Livestock value	Dollars	1850	653.55	493	0	500	3,520	161
		1860	990.34	1,021	0	850	5,325	158
		1870	1,272.23	945	0	1,150	5,670	197
		1880	784.87	750	0	600	4,500	161
Oats	Bushels	1850	85.68	100	0	0	1,000	161
		1860	81.87	100	0	6	800	158
		1870	54.56	50	0	0	900	197
		1880	69.63	90	0	0	1,400	161
Tobacco	Pounds	1850	9,475.15	13,000	0	6,000	80,000	161
		1860	12,943.04	15,775	0	10,000	100,000	158
		1870	5,160.08	8,000	0	4,000	40,000	197
		1880	7,128.88	8,000	0	6,000	25,000	161
Unimproved land	Acres	1850	85.32	75	0	50	800	161
		1860	70.73	58	0	50	500	158
		1870	56.74	45	0	43	297	197
		1880	38.21	35	0	27	418	161
Wheat	Bushels	1850	614.50	550	0	400	5,000	161
		1860	556.07	700	0	380	2,700	158
		1870	319.35	500	0	182	1,850	197
		1880	164.09	200	0	60	1,450	161

*IQR=interquartile range

Statistics calculated using the software program R (2016).

The *t*-tests and one-way ANOVAs require normally distributed data that fit the ideal "bell-shaped" curve. However, the variables were not normally distributed due to outliers that right-skewed the data. Before conducting the tests I ran a natural logarithmic transformation to distribute the data more normally. Not all farms produced the same products each year, and a zero was recorded for those variables creating "holes" scattered across the dataset. I removed the zero values by variable in order to run the *t*-tests and one-way ANOVAs. The results, therefore, reflect mean crop production based only on the farms growing that crop in that census year.

Results from the First Election District Analysis

To measure the changes in agricultural practices for my sample population, I chose three aspects of agricultural production to analyze: the size of farms based on improved and unimproved acreage, value, or monetary worth, of the farm land and structures, and the types and amounts of crops produced. Improved acres referred to cleared acres used for planting crops and unimproved acres were forested land or swamp that was not used toward farm production. For the scope of this study, the size, value, and crops make up a farm's "agricultural practices." Other variables, e.g., livestock quantities, equipment value, and farm products (such as butter or fruit), either did not have enough data within the First Election District to test statistically or were not found to have a significant correlation to farm size, value, or crop production. The other agricultural census variables certainly played a part for individual farms, but were not measurable at the district level.

After pulling together the data for the First Election District from 1850 to 1880, I explored the summary statistics of the dataset. The summary statistics for selected variables for the total number of farms (N) in each year are shown in Table 1. The summary statistics include the mean, interquartile range (IQR), minimum, median, and maximum values of each of the variables. The IQR measures the middle 50% of the data by subtracting the 75th percentile from the 25th percentile. The farther the IQR is from the median, the less normally distributed the data is. These basic statistics begin to show patterns and outliers in the data.

What Constitutes a Farm?

One pattern based on the minimum values for farm value and size is worth discussing. Nearly every variable in every census year from 1850 to 1880 contains a minimum value of zero, which indicates there was a least one farm in every year that did not record any value for that variable (TAB. 1). For example, farm value and improved land have a minimum value of zero in the 1850 census (U.S. Bureau of the Census 1850a). Beginning in the 1860 census, the data show a minimum farm value of $150 and a minimum of 5 ac. of improved land (U.S. Bureau of the Census 1860a). The changes in the minimum amounts for farm value and improved land are not necessarily related to the success or growth of farms. Rather, the data reflect changes in how enumerators were recording farms in the censuses. Households in the 1860 census had to meet the new minimum requirements that defined the parameters of a "farm" in order to be recorded in the agricultural census. A household must have had at least $100 of revenue from farm products and land greater than a "small lot" (U.S. Bureau of the Census 1860a). These instructions gave enumerators some discretion in defining what constituted a "small lot." These minimum requirements for defining a farm, as seen in the data, demonstrate how the collection of census information can affect the trends in the data.

In 1870, enumeration guidelines for farms became even more specific in regard to the acreage and increased the minimum value needed from the sale of produce. The instructions read:

> Mere cabbage and potato patches, family vegetable gardens, and ornamental lawns, not con-

> stituting a portion of a farm for general agricultural purposes, will be excluded. No farm will be reported of less than three acres, unless five hundred dollars' worth of produce has been actually sold off from it during the year. (U.S. Bureau of the Census 1870a)

The 1870 census guidelines also instruct that "wherever there is a resident overseer, or a manager, there a farm is to be reported" (U.S. Bureau of the Census 1870a), taking into account the growing system of tenant farmers and sharecroppers. For some tenant farmers and sharecroppers their acreage and produce value may not have qualified them to be recorded in the agricultural census. However, if there was an overseer or manager of the tenant farmers and sharecroppers, that person would be recorded as the farmer in the agricultural census.

This method of evaluating farms excluded from the record over one quarter of the population in rural Maryland who were subsistence farmers. "By 1880, 70% of rural Marylanders owned their own land (almost all white), about 23% were sharecroppers, and the rest tenants" (Brugger 1988: 329). The exclusion of these farmers from the official agricultural census record delegitimized them as farmers, removing them as active contributors to agricultural production.

It was not until 1900 that the census recorded individual farm numbers from the agricultural schedule in the corresponding entry for that farmer in the population schedule (U.S. Bureau of the Census 1900). This made it possible to cross-reference the two census schedules and gather demographic information about the farmers. Prior to the 1900 census, cross-referencing required identifying the farmers in the agricultural schedule by last and first name (where full first names were given) and matching the names with the heads of household in the population schedule. I attempted to cross-reference people listed as "farmers" in the population schedule with the farmers recorded (or not recorded) in the agricultural schedule. This would have provided demographic data for the unrecorded subsistence farmers, but there were significant gaps in identifying farmers listed on the agricultural schedule and their corresponding household entry in the population schedule. There was not enough data with which to draw conclusions about unrecorded subsistence farmers for the First Election District, further highlighting the erasure of subsistence farmers from the archival record.

Distribution of Farm Size and Value

My hypothesis, based on farmstead scholarship, predicted that the number of farms in the district would increase, especially after the Civil War, due to larger farms selling or renting their land as a revenue strategy. If this were the case, the data should show a decline in average total acreage per farm. The number of farms (N) recorded in the district fluctuated between 1850 and 1880 (U.S. Bureau of the Census 1850a, 1860a, 1870a, 1880a), with an increase of 39 farms added between 1860 and 1870, before decreasing by 36 farms in 1880 (TAB. 1). The average total acreage of farms (including improved and unimproved land) steadily decreased from 292 average total acres per farm in 1850 to 171 average total acres in 1880 (TAB. 1). This shows that the hypothesis was true in 1870, since that year recorded a decrease in average acres and a significant increase in the number of farms. However, it was not true for 1880, when the number of farms fell, alongside the decrease in average acres per farm in the district. This consistent drop in average acreage per farm in the district shows that, despite the increase in the number of farms in 1870, the division of existing farms to create new farms was not the trend from 1870 to 1880.

A possible explanation for the increased number of farms in the First Election District in 1870 is increased population in the county. In 1860, Anne Arundel County's population included 7,332 enslaved people, 4,864 free persons of color, and 11,704 free white persons, for a total population of 23,900 people (U.S. Bureau of the Census 1860b). In 1870, following the removal of the slave schedule from

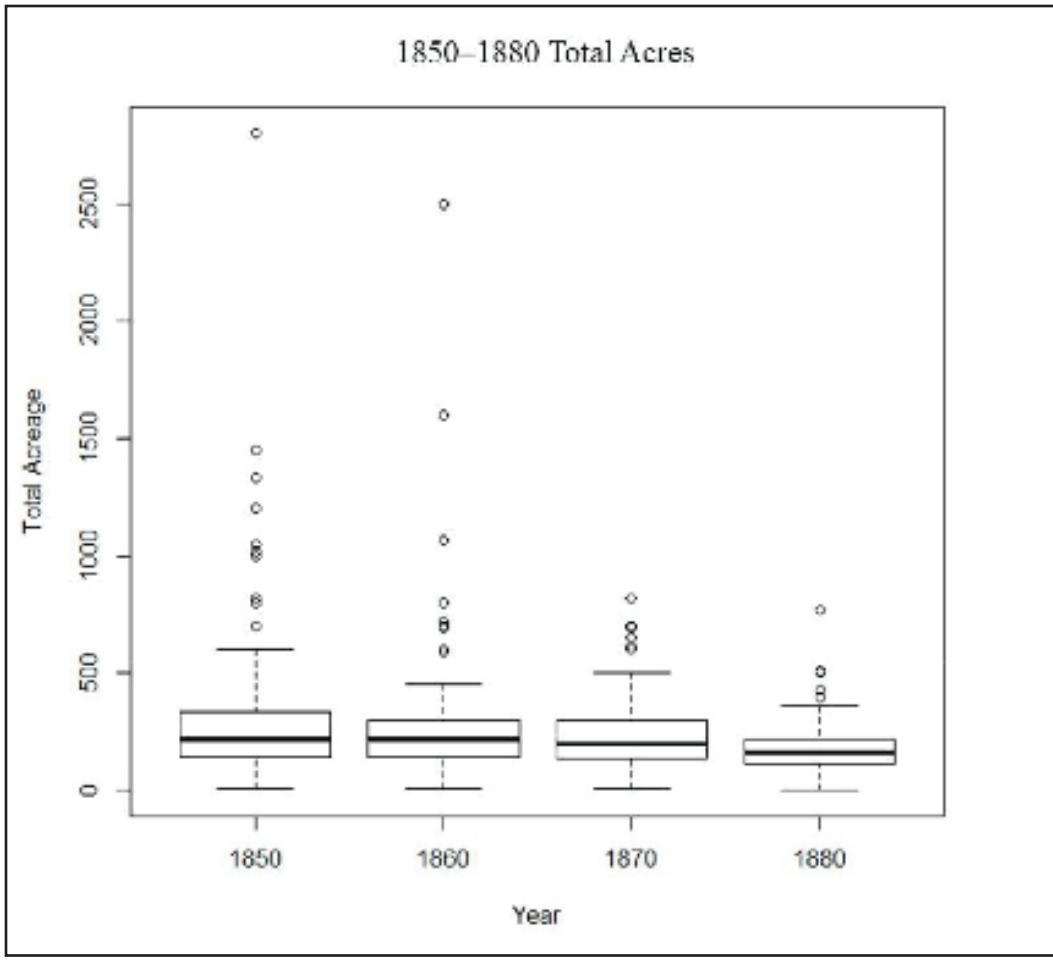

Figure 2. Boxplots showing total acres per farm for census years from 1850 to 1880 (both improved and unimproved acres). Outliers are represented by circles and show a decrease in extreme outliers in 1870 and 1880. (Statistics and graph produced using the software program R [2016]; Figure by Sarah N. Janesko, 2019.)

the census records, there were 11,732 persons of color and 12,725 white persons, for a total of 24,457 people residing in the county (U.S. Bureau of the Census 1870b). The overall population increase for the county parallels the increase in the number of farms in the First Election District from 158 farms in 1860 to 197 farms in 1870 (U.S. Bureau of the Census 1860a and 1870a).

There was also a steady decrease in improved acres that would have contributed to a farm's sale of produce. There were 46,956 ac. farmed in 1850, but merely 27,532 ac. farmed in 1880 (U.S. Bureau of the Census 1850a and 1880a). This means there was about 40% less land in use for agricultural purposes. The loss of total improved acreage by 1880 was more likely a reflection of the reduction in the number and size of farms.

The boxplots of farm acreage by census year (FIG. 2) show the minimum, median, maximum, and outlying values. In the boxplots showing total acres per farm, the extreme outliers shown in 1850 and 1860 are no longer as extreme in 1870. By 1880, the largest farm was 768 ac., about 30% less land than the largest farm in 1850, which contained 2,500 ac. (U.S. Bureau of the Census 1850a and 1880a).

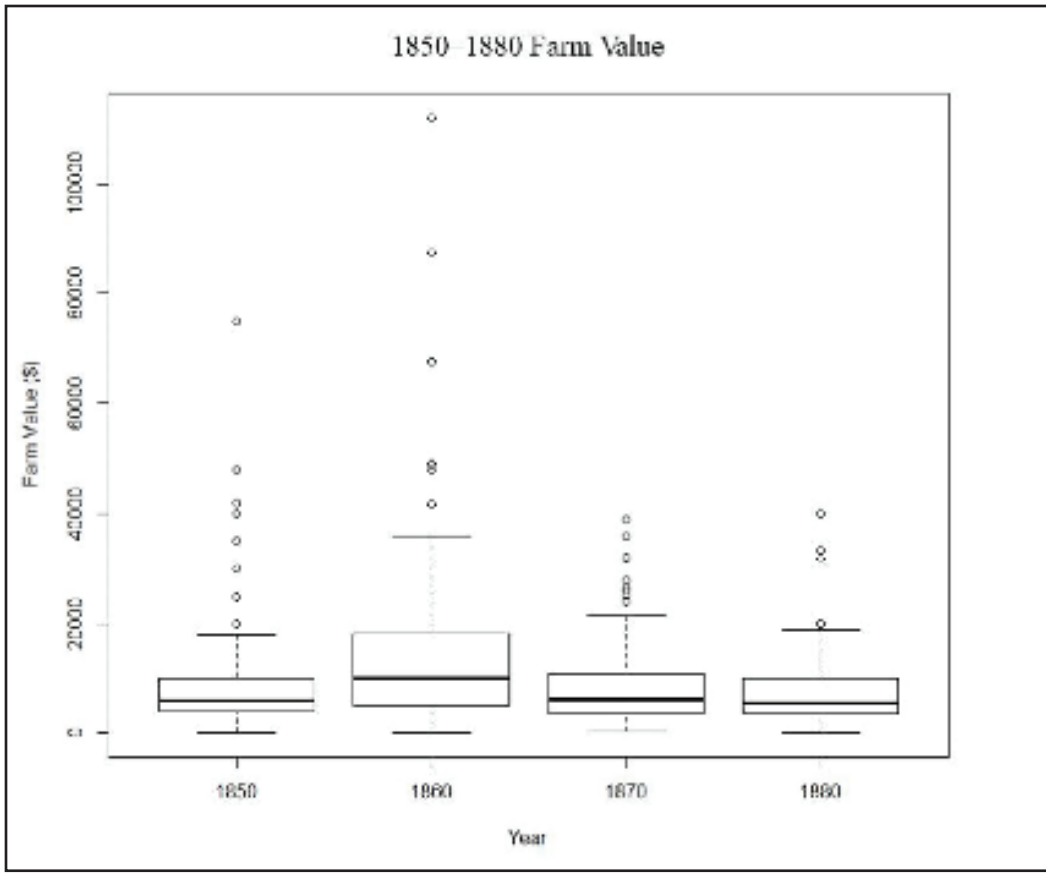

Figure 3. Boxplots showing farm values for census years from 1850 to 1880. Outliers are represented by circles and show a decrease in extreme outliers in 1870 and 1880. (Statistics and graph produced using the software program R [2016]; Figure by Sarah N. Janesko, 2019.)

Although there are still a handful of large farms that can be considered outliers in 1880, the difference between the median and those large farms is not as significant.

In looking at the second aspect of agricultural production, the boxplots show that farm values were higher in 1860 than in any other year (FIG. 3). The median value of farms in 1860 ($10,000) exceeds the median value of farms in the other census years. The two highest farm values in all four years were recorded in 1860 ($112,000 and $87,500), and both are shown as outliers in the boxplot in Figure 3 (U.S. Bureau of the Census 1860a). The boxplot for 1880 (FIG. 3) shows a spread of farm values similar to those of 1850 and 1870. In 1880, however, the extreme outliers (farms valued at over $50,000) seen in the other census years no longer exist.

The extreme outlier farms identified in the farm-value and acreage variables raise important questions about who owned those high-value farms and whether the same farms are represented in successive years. The agricultural census schedule indicates that Dr. R. S. Stewart owned the highest-valued farmstead in 1850, at $75,000 with a total of 1,450 ac. He remained the wealthiest farmer in this district in 1860, with a farm value of $112,000 and a total of 1,600 ac. In 1870, William G. Mackall owned the highest-valued farm, worth $39,000 and comprising 600 ac. While Stewart does not show up in the data as one of the wealthier farmers in 1870, the census does show three

separate entries for R. S. Stewart in that year, with land totaling 1,600 ac. and a total farm value of $64,000 (U.S. Bureau of the Census 1850a, 1860a, and 1870a).

If those three entries were recorded as one, that farm would have counted as an extreme outlier. This demonstrates not only the continuity of wealth for the owners of the largest farms, but also potential problems when tracking an individual farmer. The division of one farmer's land into smaller farms suggests owning multiple smaller farms may have been a strategy employed by the wealthiest farmers. Alternatively, there may have been differences in how enumerators chose to record farms based on their interpretation of the census guidelines.

Based on the data, the number of farms fluctuates after the Civil War with a significant increase by 1870 and then a decrease by 1880. The size of farms steadily decreased from 1850 to 1880, as did the total number of improved acres in the district. While the average value of farms does not change drastically, several of the most highly valued farms are no longer represented in 1880. Based on this information about farm size and value, I hypothesize that many farmers were selling, renting, or dividing their farms—contributing to the fluctuation in the number of farms each year. If so, this strategy would have paralleled the increase in the number of subsistence farms in the decades after the Civil War. While some subsistence farms may have shown up in the agricultural censuses as smaller farms, it is likely some subsistence farms were not recorded in the census due to their small size and lower value. An increase in unrepresented subsistence farms as a result of the division of larger farms would explain the decrease in the average size of farms and average number of improved acres in the district.

Analysis of Changes in Crop Production

Crop production was the third aspect of agricultural production I used to evaluate how farms changed after the Civil War. I conducted two-sided independent-sample *t*-tests on the district's main crops of tobacco, wheat, corn, and oats. I chose two samples of crop data from the 1860 and 1870 censuses to run the *t*-test (U.S. Bureau of the Census 1860a and 1870a). These sampled years would best determine whether mean crop yields differed significantly before and after the Civil War. Based on the demonstrated decrease in farm size and the number of improved acres from 1850 to 1880, I hypothesized (H_1) that there would be a significant difference in mean crop production between 1860 and 1870, with the null hypothesis (H_0) indicating no significant difference in mean crop production. Significant differences in means were determined at a 95% confidence level ($p<0.05$), at which point the null hypothesis was rejected.

The results of the four *t*-tests are shown in Table 2. Since my hypothesis predicted a decline in production for all four crops and only three of the crops showed a significant decline, the results partially rejected the null hypothesis. Difference in the average number of bushels of oats produced in each year (M_{1Oat}=4.72, M_{2Oat}=4.43) was not statistically significant (t=1.9, df=150, p=.06), thus failing to reject the null hypothesis and proving no significant difference in the means. The difference in mean pounds of tobacco produced

Table 2. Results of *t*-tests for four variables (log.) with a significance level of 0.05.

Crop	*t* Statistic	Degrees of Freedom	*p* Value	1860 Mean (M1)	1870 Mean (M2)
Tobacco	7.4	250	2e-12	9.41	8.66
Wheat	3.8	260	0.0002	6.14	5.70
Corn	2.3	280	0.02	6.82	6.59
Oats	1.9	150	0.06	4.72	4.43

Statistics calculated using the software program R (2016).

Figure 4. Line graph showing mean crop production from 1850 to 1880 using logged means. (Statistics and graph produced using the software program R [2016]; Figure by Sarah N. Janesko, 2019.)

(M_{1Tob}=9.41, M_{2Tob}=8.66) was the most statistically significant (t=7.4, df=250, p=2.0e-12). Mean bushels of wheat (t=3.80, df=260, p=.0002) and corn production (t=2.3, df=280, p=.02) also showed statistically significant differences, but with less-significant p values than tobacco. I rejected the null hypothesis for tobacco, wheat, and corn, indicating mean production of these crops decreased significantly from 1860 to 1870, and, of the four crops, tobacco production showed the greatest change (FIG. 4).

The results from the t-tests indicate there is validity to the hypothesis that crop production significantly decreased in the census decade after the Civil War, but that change is only shown between two census years. In order to understand how this decrease in the crop-production trend extends beyond those two sampled years, I conducted one-way ANOVAs to analyze mean crop production from all four census decades, 1850, 1860, 1870, and 1880. This statistical technique compared the variance calculated within each sample census year to the variance calculated between the four sample census years. Because of the results from the t-test, I predicted the rejection of the null hypothesis (H_0) and a significant, steady decline in crop production from 1850 to 1880.

Mean wheat production variance was the most significant (F (3, 511)=24.8, p=5.2e-15). The average amount of wheat produced decreased from 1850 to 1880 with the lowest mean production in 1880 (m=5.12, sd=1.00, n=97) and the highest production in 1860 (m=6.14, sd=0.96, n=127). Tobacco production showed the second most significant variance in means F(3, 512)=24.6, p=7.0e-15. The average amount of tobacco produced was highest in 1860 (m=9.41, sd=0.81, n=124) and was lowest in 1870 (m=8.66, sd=0.82, n=133). While there were more farms producing tobacco in 1870, the average yield declined.

Change in mean corn production across four decades was significant $F(3, 630)=6.83$, $p=1.6e\text{-}3$, but with a lower p value than the other crops. The average amount of corn production was highest in 1850 ($m=6.99$, sd=0.90, $n=152$) and was the lowest in 1880 ($m=6.49$, sd=0.92, $n=156$). While average corn production in these years showed the least significant change, Figure 4 demonstrates it was the second most produced crop, on average, of the four main crops. Average oat production variance was not found to be significant $F(3, 294)=2.96$, $p=0.033$, and oats were the least-produced crop (FIG. 4).

The ANOVA tests concluded that the variance of mean tobacco, wheat, and corn production across four census years was significantly lower, while the variance of mean oat production was not. The null hypothesis was partially rejected, since three of the four crops showed a significant variance of means.

To determine the years between which the greatest difference occurred, a post hoc analysis was conducted using pairwise comparisons of means. Since tobacco production showed the greatest variance of means, it was the only crop for which a post hoc analysis was run. Pairwise comparison of means for tobacco showed an insignificant p value of 0.07 for the change in mean production between 1850 and 1860, illustrating that these years saw similar yields for this crop. This insignificant change in means also occurred between 1870 and 1880 ($p=0.98$). The two years with the greatest change in average production of tobacco were 1860 and 1870 ($p<0.001$). The post hoc analysis further illustrated the significant decline in tobacco production in the census years before and after the war.

Discussion of Crop Production Changes in the First Election District

The purpose of the statistical tests was not to determine what caused the changes in agriculture, but rather to quantify the changes in the local district and determine the time frame in which the greatest change occurred. Nonetheless, the factors affecting these changes are relevant in order to understand how the Sellman farmstead experience fits within the local context.

Among the notable results from the statistical analyses, the t-tests showed that the only crop with no demonstrable change in average production was oats. The insignificant change in mean bushels of oats produced in 1860 and 1870 indicates that this crop, which was primarily used as livestock feed, was unaffected by the forces driving down production of tobacco. Farmers were not relying on oats for income, but still needed the crop to feed horses and livestock, and to use in crop rotation. Hoffman and Livezey (1987) note that oat production in the North exceeded that of the South after the war, and that, "by 1869, the center of production had moved to the upper Mississippi Valley," with Illinois leading production (Hoffman and Livezey 1987: 3). For the First Election District, oats remained a consistent but low-producing crop for farmers that were experiencing significant challenges in sustaining their cash crops.

The ANOVA tests indicated production measured in mean bushels of wheat in the district increased by 1860, then decreased significantly by 1870 and continued to decrease to 1880. This differs from the national average for wheat production, which rose during this time due to westward expansion and the adoption of new machines for cultivating grains. The center of wheat production in the U.S. shifted west between 1860 and 1870, so that by 1870 "only one of the ten leading states was east of the Alleghenies, and four were west of the Mississippi" (Towne and Rasmussen 1960: 261). This expansion was spurred in part by the Homestead Act of 1862, which encouraged individual farmers to settle on government land west of the Mississippi. Additionally, improved steam-powered threshers, harvesters, and reapers in the latter half of the 19th century increased the efficiency of grain farming and the machines were well adapted to the flat landscape of the Midwestern states (U.S. Census 1880a).

By the 1880s, Annapolis, the state capital, just 10 mi. north of the First Election District, was connected to Baltimore 30 mi. to the north and to western states by a series of railroads. This gave wheat farms in the western states easy transportation for their product to eastern states like Maryland. "A heavy proportion of tobacco, cotton, grain, and livestock that [Baltimore] city firms handled came from southern sources—either via coasting vessels sailing from Norfolk and Savannah, or by rail" (Brugger 1988: 316). This increased connection with southern and western agricultural markets meant competition for First Election District farmers. The district's decline in wheat production can be explained by the regional shift in wheat production away from the eastern states.

Comparison between mean tobacco production for 1860 and 1870 showed a significant decrease in 1870. As the First Election District's primary cash crop, tobacco's significant decline in 1870 and 1880 demonstrates how drastically this crop was affected as a result of the war. The introduction of machinery to replace farm labor during this period did not aid tobacco production, which still required hand harvesting and a greater amount of labor than other crops. Tobacco had been the major cash crop for southern Maryland farmers since the 17th century (Clemens 1980; King 2001) and was harvested and produced with slave labor until the abolition of slavery in Maryland in 1864.

The war affected both the labor and the capital needed to produce tobacco. During the war, many laborers and primary breadwinners were pulled away from farm work to enlist or were drafted on both sides. Those who returned home alive were sometimes disabled and unable to work in the fields. After the war, farmers in Maryland, especially southern counties like Anne Arundel, were hardest hit by the economic impacts since those farmers relied heavily on enslaved laborers for the production of tobacco (Brugger 1988: 329). Many families faced the economic hardship that followed the loss of primary breadwinners, thus affecting the capital needed for reinvesting in tobacco production.

To add to the economic hardship following the Civil War, the Panic of 1873 was a major event that brought a worldwide, six-year economic depression. This depression had severe effects on the national economy, resulting in lower commodity prices, including agricultural products. For Southern farmers whose staple crop was cotton, the reaction to these market changes was to increase the acreage and production of cotton in an attempt to recuperate lost revenue (Reidy 1990: 244–245). This trapped many farms, large and small, in debt due to the lower prices for their product. But tobacco farmers in Maryland significantly decreased the acreage dedicated to their staple crop suggesting they were unable to support the labor or capital needed to continue to grow tobacco at the same rate as before the war.

Some farmers responded to these changes by diversifying their agricultural production to include dairying, canning, and fruit sales in limited quantity. In fact, canning became one of the most important industries in nearby Baltimore in the decades following the Civil War. Oysters could be canned during the harvest season from October to March, while fruits and vegetables could be processed in the warmer months, making canning a year-round industry (Brugger 1988: 314). While not heavily represented in the agricultural censuses, these products were sources of revenue for subsistence farmers as demonstrated by the archaeological record.

The statistical analysis showed decreases in farm size, value, and crop production in the First Election District. These decreases are explained by historical factors affecting farmers, including changes in labor, technology, transportation, and the economy. However, my aim is not to determine which factors caused the changes in the district but to provide historical context for the district through archival records. This creates a setting for analyzing the preliminary results

from archaeological investigations at the Sellman farmstead.

The Sellman Farmstead from the Archival Records

Located within the First Election District, the Sellman farmstead was owned by several generations of the Sellman family from 1729 to 1917 (FIG. 1). The farmstead was established in the 1720s by William Sellman, the son of John Sellman, who purchased land after being freed from indentured servitude. The original home on the Sellman farmstead was built in the 1730s by William and his wife Ann and appeared to be "a prototypical mid-18th-century Maryland house of the well-to-do, built of sturdy and fashionable brick" (Building Conservation Associates 2018: 42). The Sellman House was built atop a knoll flanked by creeks to the west and east with views across their cleared farmland. Having already established their upward mobility through a "well-to-do" house, great-grandson Alfred Sellman continued to demonstrate the family's rising fortunes by building a substantial addition. In 1841, Alfred hired a Baltimore builder to construct a three-story Greek Revival style brick house, leaving a portion of William Sellman's original house as a southern wing (Building Conservation Associates 2018).

After Alfred Sellman's death in 1854, his widow Mary held the land until her death in 1860 (FIG. 1). Richard P. Sellman, Alfred's son, inherited Lot 1, on which the Sellman House sat, and retained it until he bequeathed it to his wife, Ellen Sellman, in 1887. By 1910, no Sellmans resided in the house on their farmstead, and in 1917 the Sellmans sold it to the Kirkpatrick-Howat family. In 1972, the Kirkpatrick-Howats deeded it to the Smithsonian Environmental Research Center (SERC) (Gibb et al. 2013).

While Alfred Sellman was still alive, he managed the 300 ac. farmstead, which was worth $9,000 in 1850. The slave schedule lists 25 enslaved people living on the Sellman farmstead in 1850 farming 200 improved acres. Alfred produced 25,000 lb. of tobacco, 1,500 bu. of wheat, 1,200 bu. of corn, and 200 bu. of oats that year. He kept 10 horses, 6 milk cows, 5 oxen, 40 sheep, 35 swine, and several other cattle. These animals were used to help with the labor on the farm and would have produced some household products, such as the 150 lb. of butter and 160 lb. of wool recorded for Alfred that year (U.S. Bureau of the Census 1850a and 1850b). While the farm likely provided some household provisions, the amount of tobacco grown was well above the 9,400 lb. average for the district that year. The primary purpose of his farming was to sell tobacco to increase his personal wealth.

By 1860, the now 286 ac. Sellman farmstead had increased in value to $17,160. It was the farm's second most productive census year and Richard Sellman was now managing the farm. With the number of improved acres about equal to that in the previous census, Richard had decreased his tobacco production to 20,000 lb., wheat production to 1,300 bu., corn production to 1,000 lb., and oats to 100 lb. Despite these numbers falling just below production rates from the decade before, the farm was still producing well above the district average (except for corn, which was below average). In 1860, there were 41 enslaved people living in five houses on the Sellman farmstead. Richard produced more wool (200 lb.), butter (250 lb.), Irish potatoes (25 bu.), and hay (8 tons) than his father had in 1850 (U.S. Bureau of the Census 1860a and 1860c). The amount of wool and butter produced would not have been enough to bring to market and was likely for household use. Considering the number of enslaved people on the farm, they were likely responsible for the production of the household goods like wool and butter, in addition to the crops.

Richard P. Sellman's farmstead had grown slightly in acreage, to 298 ac. but dropped in value to $11,920 by 1870. As recorded in that census year, the farm's livestock had decreased significantly in number from 128 animals in 1860 to 63 animals in 1870. He had no sheep, but managed to produce 150 lb. of wool. Crop

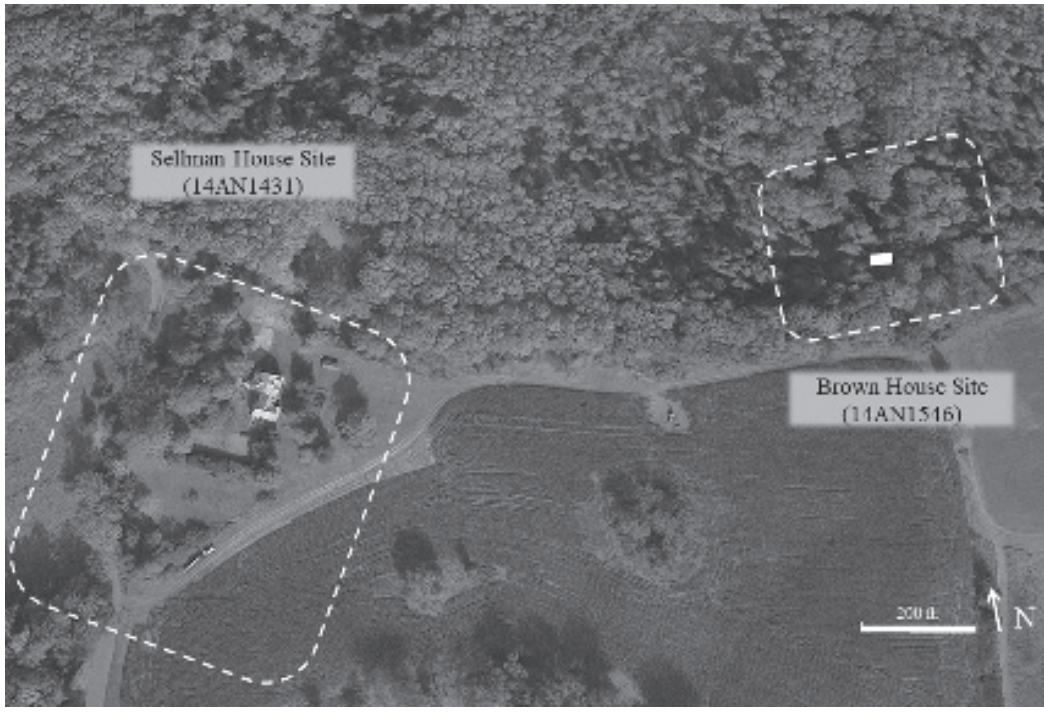

Figure 5. Satellite imagery of the Sellman farmstead showing the two investigation areas for the Sellman House site and Brown House site. The Sellman House is still standing and visible; the tenant house (indicated by a solid rectangle) no longer stands and is covered by tree canopy. (Base map, Google Maps [2019]; map by Sarah N. Janesko, 2019.)

production declined significantly to 400 bu. of wheat and a meager 2,000 lb. of tobacco—a 90% decrease from 1860. Oat production was cut in half, but Sellman increased his production of corn to 1,900 bu. (U.S. Bureau of the Census 1860a and 1870a).

By 1880, Richard P. Sellman, 41, is listed on the population schedule as a retired farmer, with no farm listed in the agricultural schedule (U.S. Bureau of the Census 1880a and 1880b). It was about this time that tenants began farming on the Sellman land. Several tenant farmers are listed near the Sellman farmstead on the 1900 population schedule and were likely renting the land, although no positive connections can be made about which tenants were on which farmsteads (U.S. Bureau of the Census 1900).

It became harder for tobacco farmers to sustain their staple crop while also paying the farmhands who remained in the First Election District. While it is not known why Richard P. Sellman retired from farming early in his life, based on the data for the First Election District, it is a reasonable assumption that as it became harder to make money solely from tobacco, he sought income from renting land. If his children did not take on the management and ownership of the farm, this may have been another reason the Sellman farmstead was rented out and sold by the early 20th century. While the Sellmans continued to live in the Sellman House on their farmstead until 1910, they were no longer managing the production of the farmstead as they once did.

The Brown House, built atop a knoll within view of the Sellman House, is the only remaining evidence of tenant farmers on the Sellman farmstead. Based on what remains of the collapsed structure, it was a 1½-story, wooden house with a plank floor. Some of the hand-hewn frame timbers remain and have fallen around the brick piers on which they

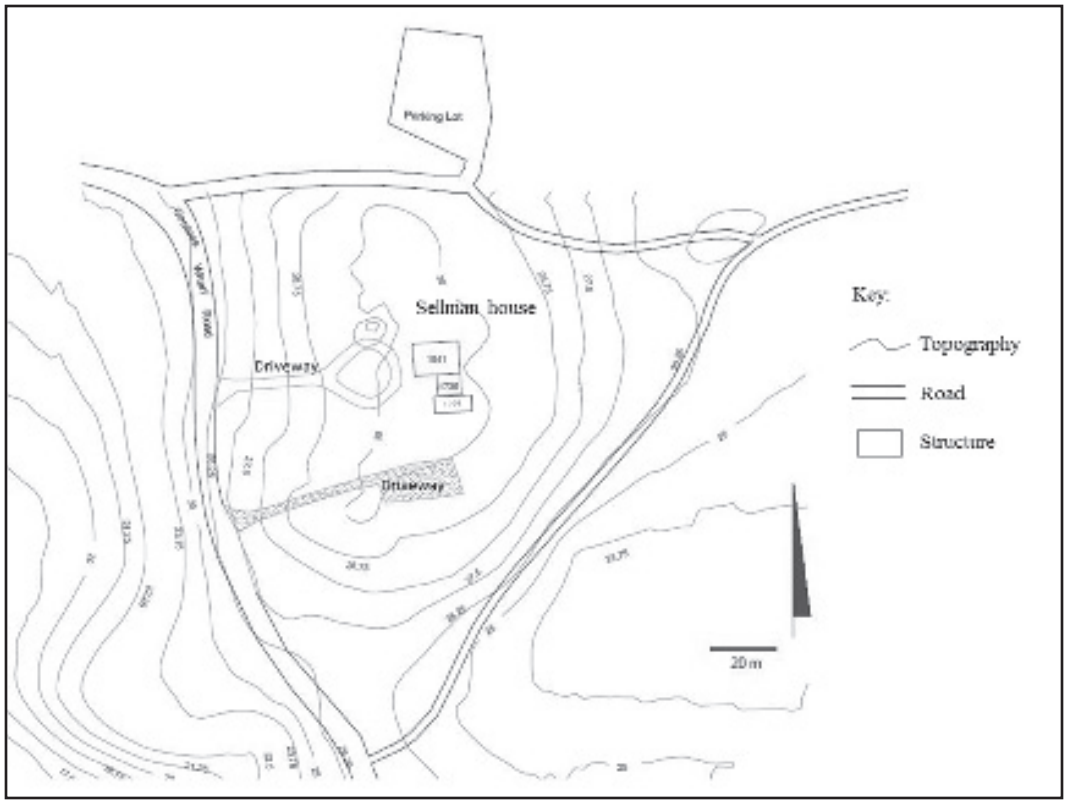

Figure 6. Topographical map showing the Sellman House site; note the three construction phases of the Sellman House: the 18th-century "wing," the 1841 Greek Revival house on the north, and the 1979 southern addition. (Base map, Gibb et al. [2013]; map by Sarah N. Janesko, 2019.)

once stood. This two-room, hall-and-parlor house had a brick chimney along the middle wall servicing a wood-burning stove. The materials and style of the Brown House were typical of tenant houses in the mid-Atlantic in the 1880s (McDaniel 1982: 17). It is not known how much land the tenant farmers rented from the Sellmans but many tenant farmers had enough land to provide for their households and begin to accumulate capital for other investments.

Based on the evidence from the archival documentation of their farm production and value from 1850 to 1880, the Sellmans exhibit a strategy that goes beyond subsistence farming to market farming. The Sellman family's agricultural experience reflects the significant trends shown in the statistical analysis for their district, although they were consistently above average in value, acreage, and crop production compared to other farms.

Excavations at the Sellman House Site and the Brown House Site

There were two separate investigations on the Sellman farmstead: one at the Sellman House site (18AN1431) and another at the Brown House site (18AN1546) (FIG. 5). From July 2012 to April 2013, Jim Gibb and citizen scientists from SERC excavated 290 shovel test pits (STPs) at 7 m intervals around the Sellman house (FIG. 6) (Gibb et al. 2013). Several 1 × 1 m test units have since been excavated in the west yard of the house as part of the citizen science program at SERC. The Brown House site— the location of the collapsed tenant house approximately 325 m east of the Sellman

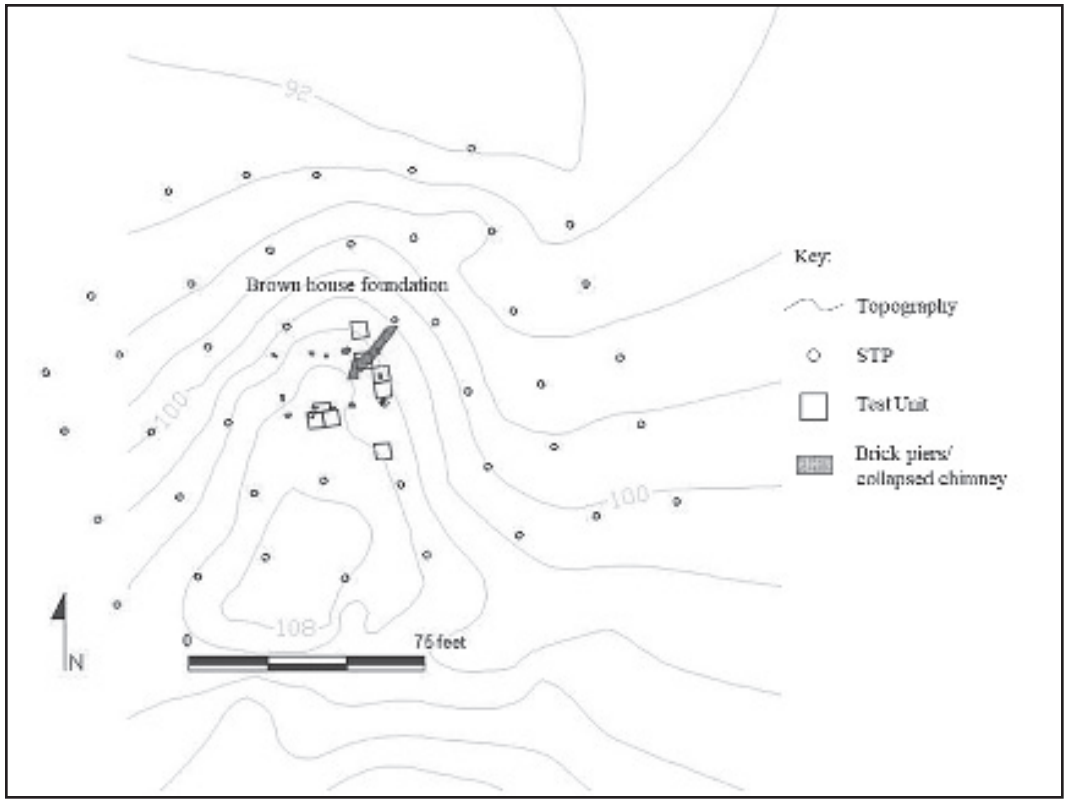

Figure 7. Topographic map from the 2014 and 2015 investigations showing the Brown House. (Figure by Sarah N. Janesko, 2019.)

House— became the focus of an investigation directed by Mark Leone with the Archaeology in Annapolis (AIA) field school from the University of Maryland College Park. During two field sessions in June 2014 and June 2015 of which I was a part, the AIA field school conducted a shovel test survey at 25 ft. intervals, resulting in 43 STPs, and excavated eight, 5 × 5 ft. test units at the Brown House site, as mapped in Figure 7 (Janesko and Markert 2016).

The primary purpose of both investigations was to identify site boundaries through shovel testing and sample the associated cultural materials surrounding the houses through excavation of several test units. The data recovered from the sites was not originally collected or analyzed to address the research questions in this article; however, the archaeological data reveal complexities about the households on the Sellman farmstead that are not expressed through the archival data. While the Sellman farmstead is above average for farms in the district, the material culture identified from shovel testing does not suggest the expenditure of wealth on consumer goods. Additionally, the material culture recovered from the Sellman House site indicates a primarily domestic space around the house, while the materials from the Brown House site show both domestic and farm-related spaces.

Shovel testing and excavation units surrounding the Sellman House site recovered few artifacts that would suggest the production of farm products of any kind. Of over 4,000 artifacts cataloged from the Sellman House site shovel test excavations, the paucity of agricultural artifacts is notable. With a low percentage of materials related to subsistence farming, such as tools specific to farming or

Table 3. Artifacts from the Sellman House site and the Brown House site by category.

Artifact Category	Sellman House Site (14AN1431) 290 STPs	Percent of Total Sellman Artifacts	Brown House Site (14AN1546) 43 STPs	Percent of Total Brown Artifacts
Arms	1	<1%	0	0%
Architectural	1,445	36%	151	17%
Clothing	5	<1%	8	1%
Energy	1,008	25%	19	2%
Equestrian	2	<1%	2	<1%
Faunal	1,145	28%	24	3%
Food storage	126	3%	238	27%
Furniture	1	<1%	0	0%
Hardware/tools	11	<1%	113	13%
Kitchen/dining	167	4%	146	17%
Native American	10	<1%	0	0%
Other modern	6	<1%	41	5%
Personal	2	<1%	1	<1%
Tobacco	8	<1%	1	<1%
Unidentified	119	3%	137	16%
Total	4,056		881	

canning jars, archaeological evidence indicates the Sellmans were likely not subsistence farmers. Only 3% of the material from the Sellman House site, which included bottles and stoneware vessels, fell into the category of food storage (TAB. 3). This suggests a physical and social separation of domestic life from the agricultural labor taking place to benefit the family. It is clear that the farm labor primarily took place away from the house, and it is possible the family may have had little involvement in the labor of the farm.

Market farming was the family's way of making money that could then be spent on household goods. However, household goods, such as kitchen and dining wares, personal items, and furniture, only accounted for about 5% of the collection. A third of the assemblage from the shovel tests falls into the architectural category (brick and mortar). Faunal material accounts for 28% (shell and bones), and energy-related materials (coal, charcoal, and oil lamps) make up 25% of the materials. While the assumption might be made that the wealth derived from the Sellmans' tobacco production was used to purchase goods, the material remains show it is likely that this revenue was invested in their house and farm.

The late 19th-century Brown House site produced 881 artifacts from shovel testing. There were high amounts of glass (n=420) and metal (n=236) among the artifacts recovered. Approximately 6% of the glass artifacts were identified as coming from canning jars. An iron pitchfork and a hoe were recovered from the ground surface surrounding the house. Canning jars, tin lids, and milk-glass lid inserts were also found in the test excavation units around the house (Janesko and Markert 2016). These food-storage artifacts made up 27% of the assemblage recovered through shovel testing—a much higher percentage when com-

pared with the Sellman House site (TAB. 3). The proximity of farming and canning-related artifacts around the Brown House suggests that subsistence farming activities were integrated with the everyday experience of the household. Although it is difficult to accurately identify the tenants in the agricultural censuses, they were likely practicing subsistence farming and may not have had enough produce to sell for cash.

The material culture evidence and archival records related to the Sellman House support the theory of a separation of the household from agricultural practices. The Sellmans were likely experiencing many pressures, including economic factors; however, it is worth hypothesizing that, since the Sellmans were not actively engaged in daily labor to cultivate their cash crop, the family would have been distanced from the environmental effects of its agricultural practices on the land. As was the case with many southern Maryland farmers, they practiced market farming primarily through tobacco production using the labor of enslaved people, which exhausted the soil, until that strategy was no longer sustainable. With relatively small quantities of wheat, corn, and oats planted on their roughly 250 improved acres compared with the amount of tobacco produced, there would have been little room for crop rotation to allow for soil restoration between the 13-month tobacco harvest cycles. This reliance on a single crop to sustain the farm and increase capital depleted the soil of nutrients much faster than a more diverse crop rotation strategy. This contributed to soil erosion, creating steeper slopes and increasing deposition of soils into nearby streams (Jordan et al. 1997). Whether or not the Sellmans took these factors into account when making decisions about their crops, in addition to the economic pressures affecting farms after the Civil War, remains unclear.

Future Research

While the archival data support the narrative of the Sellman farmstead, they do not show the intricacies that could be analyzed using more targeted archaeological research. Future archaeological research should better measure the relationship that the Sellmans, the enslaved people, and the tenant farmers occupying their farmstead had with the process of agriculture. Locating and sampling for material culture remains around farm structures would help to build a layout of the farmstead and understand the locations of work areas in relation to the Sellman House. Due to the many task-specific structures on farms, understanding the ways the buildings and boundaries changed as production changed contributes to the construction of a narrative of the farmstead's use. Mary Beaudry (2001: 139) argues that "what is required is a landscape archaeology approach that examines the farm feature system as an integrated whole." Important for adding to the known features on the Sellman property would be future excavations in the locations on the farmstead where enslaved people may have lived. With a more complete map, archaeologists will be better equipped to interpret the domestic and agricultural spaces of the Sellman farmstead.

The citizen science program in environmental archaeology at SERC is equipped with the sites and methods for answering future research questions including: were the Sellmans knowledgeable about the negative effects of heavy tobacco farming on the soil?; and, did separation from the labor on the farm factor into the Sellmans' agricultural management decisions? Understanding and measuring whether a separation from the agricultural process correlates with environmental changes, if thoughtfully studied through historical archaeology, could provide interesting results that might be applied to household strategies today. This is directly relevant to SERC's citizen science program in environmental archaeology, which aims to measure how historical households used and changed the environment at different points in time.

The next step for the census and statistical dataset is integrating it with spatial data. Using a GIS database, SERC citizen scientists

hope to understand geographic patterns in the dataset using historical atlases and land records to reconstruct historical farm boundaries and then match the spatial locations of farms with the farmers listed in the censuses. Working with a typology of farms in the First Election District (Gilbert 2015) and with the aid of archival records, relationships between agricultural variables can be explored with spatial data. Integrating data about soil quality, topography, and shoreline loss with other current environmental data will provide a window into the relationship between farm data and environmental data. This spatial framework can provide a model for how different historical farm strategies have affected the rural landscape.

The combination of census, archaeological, land record, and environmental data could significantly benefit the archaeological community by introducing academically diverse research methods and theories. By providing insight into the historical context of human interaction with the land, this dataset can benefit ecological research, as demonstrated by Geleta et al. (2014) and Rick et al. (2016). Similar combinations of spatial, archival, and archaeological datasets have proven relevant and effective for archaeologists seeking to understand economic and social changes in rural landscapes and populations (Heaton 2003; Pruitt 2014). This future research will promote interdisciplinary study among anthropologists, ecologists, geographers, and other physical and social scientists—a diverse research team in which citizen scientists at SERC aim to participate.

Conclusion

In order to understand changes in agriculture surrounding the Civil War, I measured changes in farm size, farm value, and crop production in Anne Arundel County's First Election District. Analysis of means and variances of tobacco, wheat, corn, and oats from 1850 to 1880 demonstrated significant decline in crop production in the decades after the Civil War, especially for tobacco, the most labor-intensive crop. These statistical analyses provide quantitative historical context for documented trends in 19th-century agriculture as a baseline for archaeological research of farmstead sites in the district. Farmers made decisions about their crops based on many factors, including broader economic, social, and potential environmental contexts. Those contexts changed significantly between the 1860 and 1870 censuses, and so did crop production. I argue that the Civil War redirected the agricultural industry of the nation and, in turn, local farmsteads.

This local change was shown through the results of the statistical analyses of the agricultural census data for the First Election District. The census data indicated that crop production on the Sellmans' farmstead declined in a manner similar to that of other farms in the district. This is likely because the success of their farm relied ultimately on tobacco production, as did so many of their neighbors' farms. The decline of the Sellman farm followed as tobacco production became more difficult to sustain.

The archaeological survey of the Sellman House site demonstrated how the Sellmans invested their profits back into their estate and land rather than household goods. When compared to the Brown House site, occupied by tenants living on the Sellman farmstead in the 1880s, the recovered material culture shows a greater number of farm-related artifacts around the Brown House. The Sellmans' physical and social distance from the labor of the farm may have influenced their decision to maintain their reliance on tobacco. Further archaeological study is needed to examine this family's agricultural strategies and their effects on the rural landscape.

While this study does not delve deeply into environmental or archaeological data, there are clear environmental implications for understanding changes in 19th-century agriculture. Farming was, and continues to be, a significant industry in Maryland. The strategies that farmers use to manage their farms can change the rural landscape, the effects of which accu-

mulate each season and with each generation of farmer. Archaeologists have an important role to play in the scientific study of the relationship between farmers and the land to understand the strategies they employed and the long-term results of those strategies. This can be observed through material culture and environmental landscapes transformed over generations, as the balance of tradition and innovation was continually re-imagined. For both market and subsistence farmers, like the Sellmans and the tenants at the Brown House site, archaeological data are needed to answer questions about the environment that cannot be investigated solely through the written record.

Acknowledgments

This project was made possible due to the wonderful staff and volunteers of the citizen science program at the Smithsonian Environmental Research Center. Funding for the author's attendance at the Council for Northeast Historical Archaeology conference in 2015 to present on this research as part of the session "Domestic Life and Its Environment" came from the Smithsonian Institution Grand Challenges Grant. The author would also like to recognize the work of the Archaeology in Annapolis 2014 and 2015 field schools, in which the author participated, for the fieldwork at the Brown House site. A special acknowledgment goes out to the author's fellow volunteer researchers who contributed to this issue, for their dedicated work. Kiley Gilbert, Ray Sarnacki, and others who assisted in collecting data and transcribing censuses are sincerely thanked. Those who helped with comments and revisions are greatly appreciated, as is Russell Miller for his support.

References

Beaudry, Mary C.
2001 Trying to Think Progressively about Nineteenth-Century Farms. *Northeast Historical Archaeology* 31(1): 129–142.

Brugger, Robert J.
1988 *Maryland: A Middle Temperament, 1634–1980*. Johns Hopkins University Press, Baltimore, MD.

Building Conservation Associates, Inc.
2018 The Sellman/Kirkpatrick-Howat House (Woodlawn) Historic Structure Report. Manuscript, Smithsonian Environmental Research Center, Edgewater, MD.

Catts, Wade
2001 Research Questions for the Archaeology of Rural Places: Experiences from the Middle Atlantic. *Northeast Historical Archaeology* 31: 143–154.

Clemens, Paul G. E.
1980 *The Atlantic Economy and Colonial Maryland Eastern Shore: From Tobacco to Grain*. Cornell University Press, Ithaca, NY.

De Cunzo, Lu Ann
2001 The Archaeology of Agriculture and Rural Life in Northern Delaware, 1800–1940. *Northeast Historical Archaeology* 31: 85–112.

Geleta, Samuel B., Christopher H. Briand, Michael E. Folkoff, and Brent J. Zaprowski
2014 Cemeteries as Indicators of Post-Settlement Anthropogenic Soil Degradation on the Atlantic Coastal Plain. *Human Ecology* 42(4): 625–635.

Gibb, James G., Sarah A. Grady, and Richard S. Gorsky
2013 A Phase II Archaeological Site Examination of the Homestead House Site (18AN1431), 506 Contee's Wharf Road, Edgewater, Anne Arundel County, Maryland. Report to Smithsonian Environmental Research Center, Edgewater, MD from Gibb Archaeological Consulting, Annapolis, MD.

Gilbert, Kiley A.
2015 Spatial Context and Farm Types of Anne Arundel County, Maryland, 1850–1880. Paper presented at the Annual Meeting of the Council for Northeast Historical Archaeology, Fredericksburg, VA.

Google Maps
2019 Google Maps. Google.com <Google.com/maps>. Accessed 14 January 2019.

Groover, Mark D.
2008 *The Archaeology of North American Farmsteads*. University Press of Florida, Gainesville.

Harris, J. William
1994 Crop Choices in the Piedmont before and after the Civil War. *Journal of Economic History* 54(3): 526–542.

Heaton, Patrick J.
2003 Farmsteads and Finances in the Finger Lakes: Using Archival Resources in a GIS Database. *Northeast Historical Archaeology* 32: 29–44.

Hoffman, Linwood A. and Janet Livezey
1987 *The U.S. Oats Industry*. U.S. Department of Agriculture, Commodity Economics Division, Economic Research Service, Agricultural Economic Report No. 573. Washington, DC.

Janesko, Sarah, and Patricia Markert
2016 Site Report on the Phase I and II Archaeology at the Sellman Farm Tenant House Site (18AN1546) at SERC, Contee's Wharf Road, Edgewater, MD, 2014–2015. Manuscript, Smithsonian Environmental Research Center, Edgewater, MD.

Jordan, Thomas E., David L. Correll, and Donald E. Weller
1997 Effects of Agriculture on Discharges of Nutrients from Coastal Plain Watersheds of Chesapeake Bay. *Journal of Environmental Quality* 26(3): 836–848.

King, Julia A.
2001 The Southern Maryland Tobacco Barn. *Slackwater, Oral Folk History of Southern Maryland* 3: 44–49.

Martenet, Simon J.
1860 *Atlas Map of Anne Arundel County, Maryland*. Simon J. Martenet, Baltimore, MD.

McDaniel, George
1982 *Hearth and Home: Preserving a People's Culture*. Temple University Press, Philadelphia, PA.

Pruitt, Elizabeth
2014 Locating People in the Past. Archaeology in Annapolis <http://aia.umd.edu/locate/>. Accessed 26 July 2019.

R Core Team
2016 R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org>. Accessed 31 January 2016.

Reidy, Joseph P.
1990 Slavery, Emancipation, and the Capitalist Transformation of Southern Agriculture, 1850–1910. In *Agriculture and National Development: Views on the Nineteenth Century*, edited by Lou Ferleger, pp. 229–266. Iowa State University Press, Ames.

Rick, Torben C., Leslie A. Reeder-Myers, Courtney A. Hofman, Denise Breitburg, Rowan Lockwood, Gregory Henkese, Lisa Kellogg, Darrin Lowery, Mark W. Luckenbach, Roger Mann, Matthew B. Ogburn, Melissa Southworth, John Wah, James Wesson, and Anson H. Hines
2016 Millennial-Scale Sustainability of the Chesapeake Bay Native American Oyster Fishery. *Proceedings of the National Academy of Sciences* 113(23): 6568–6573.

Towne, Marvin, and Wayne Rasmussen
1960 Farm Gross Product and Gross Investment in the Nineteenth Century. In *Trends in the American Economy in the Nineteenth Century*, edited by the Conference on Research in Income and Wealth, pp. 255-316. Princeton University Press, Princeton, NJ <http://www.nber.org/chapters/c2480>. Accessed 26 July 2019.

U.S. Bureau of the Census
1850a U.S. Census, Agricultural Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC.

1850b U.S. Census, Slave Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

1860a U.S. Census, Agricultural Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC.

1860b U.S. Census, Population Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

1860c U.S. Census, Slave Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

1870a U.S. Census, Agricultural Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC.

1870b U.S. Census, Population Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

1880a U.S. Census, Agricultural Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC.

1880b U.S. Census, Population Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

1900 U.S. Census, Population Schedule, First Election District, Anne Arundel County, Maryland. U.S. Bureau of the Census, Washington, DC. Ancestry.com <https://www.ancestry.com>. Accessed 23 June 2015.

Watershed Protection and Restoration Program

2018 WPRP Watershed Application. Watershed Protection and Restoration Program, Anne Arundel County, Maryland. AACounty.org <http://gis-world3.aacounty.org/HTML5Viewer/index.html?viewer=WPRP>. Accessed 22 January 2018.

Wurst, LouAnn and Christine L. Ridarsky

2014 The Second Time as Farce: Archaeological Reflections on the New New Deal. *International Journal of Historical Archaeology* 18(2): 224–241.

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