A Sappy **Industrial Archaeology** Story

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Industrial archaeology studies the material evidence of our manufacturing heritage and includes sites and artifacts that were associated with the extraction, fabrication, and production of a range of goods or products. The 2023 Indiana Archaeology Month theme honors the study of the various early Indiana industries. Of course, long before Indiana became a state, raw materials were processed, and goods were produced by Native Americans.

While there has been debate, current research indicates the use of maple sap to produce a sweet-tasting food was introduced to the colonists by North American Indians. In Indiana, there are currently 39 archaeological sites that are recorded as sugar camps; locations where the collected sap was refined. Of these, 35 were recorded in General Land Office (GLO) survey notes that date to the 1830s. Many of the these were identified as Native American sugar camps. Others likely were as well given the date they were recorded and their geographic location (Wabash County – 8; Cass County – 6; Miami County – 6; Marshall County – 3; Noble County – 3; Porter County – 3; Howard County – 2; Fulton County – 2; Whitley County – 1). Of the other five archaeological sites recorded as sugar camps, only two have clear archaeological evidence of maple sap processing and those are linked to later Euroamerican nineteenth-century endeavors.

Sugar was regarded as a rare and costly spice, and it remained so up to the colonial discovery of America at the end of the fifteenth century. It was not until tea and coffee drinking became habits at the end of the seventeenth century that sugar became widely used. Among the early colonists of the northern United States, maple sugar was the only sugar used because cane sugar was more expensive (Bryan 1937:3). Maple sugar was the main product in the 1700s through the early 1900s, but syrup quickly replaced sugar as the main sap product in the early 1900s (Keener et al. 2010:133). In 1860, maple sugar production in the U.S. peaked (Keener et al. 2010:145). By 1880, cane sugar and maple sugar were approximately equal in price and, after 1880, maple sugar production fell but that lead to a rise in the popularity of maple syrup production (Keener et al. 2010:149).

Processing Maple Sap

As soon as the sap begins to flow in late winter, maple sugar trees are tapped. Native Americans used stone tools to slash or wound the bark and allow the sap to drain into birch bark, or wooden or ceramic containers (Nearing and Nearing 1970:26–32). Historical settlers refined the process by boring a hole in each tree. Into each hole, a hollow wooden, or later, a hollow metal, spigot or “spile” that kept the hole open and provided the drainage conduit was inserted to funnel the sap into wooden, or later, metal, buckets (Kennedy 1864). Eli Mosher patented the first metal spile in 1860. More recently, plastic spiles and copper or plastic tubing have replaced earlier forms, linking a number of trees to a large bucket in a single collection spot.

Once the sap was collected, the sugar water was reduced into maple syrup or further boiled to produce maple sugar. Native Americans repeatedly added

Figure 1: Image Courtesy of the National Park Service

heated stones to wooden troughs filled with sap to achieve this [Figure 1]. Prior to 1850, boiling was most often conducted without shelter. One kettle or several were suspended over an open fire to boil the sap [Figure 2]. The technique could result in scorching the syrup or sugar and by the 1840s producers were experimenting with new heating techniques (Bryan 1937; Keener et al. 2010; University of Vermont Libraries 2023). To increase production and conserve fuel, a stone or brick furnace called an arch or long furnace was developed. The furnace had a central channel for fuel and the stone or brick walls were constructed in a rectangular fashion to hold between five and 12 kettles over the heat (Keener et al. 2010:142). Flat-bottom rectangular pans, known as evaporator pans, followed in the 1850s. The first patent by D.M. Cook occurred in 1858 (University of Vermont Libraries 2023). The evaporator pans continued to be improved and by the 1870s, a series of pans using siphon connections could move the sap from one to another and by the last pan, maple syrup cooking was complete (Nearing and Nearing 1971:57) [Figure 3]. More substantial sugarhouses occurred after the introduction of commercial evaporators. Large-scale production required greater effort and was best achieved indoors, away from the elements.

While the process for reducing maple sap is simple in theory, the execution was complex. Technology has been continuously refined to produce a better product using less labor and energy. Most of the equipment used in maple processing reflects this change over time, but not every advance in technology was adopted by all producers. There are modern producers that still use open fires and metal kettles to produce maple syrup. While the changes in technology may assist in dating the use of a maple camp, some farmers never adopted all the new technology.

Figure 2: Image Courtesy of the National Park Service

Figure 3: Image Courtesy of the National Park Service

Archaeology of Maple Sap Processing

Archaeological investigations from the Eastern U.S. suggest that features associated with maple syrup and maple sugar production are relatively distinct and therefore discernible in the archaeological record. However, with only two sugar camps recorded in Indiana with archaeological features and artifacts present (sites 12MO1345 and 12PE1507), these site types are one of the rarer archaeological resources identified in this state. Archaeological features associated with maple sap processing fall into four categories.

1. Trough sites that consist of a sunken or channel feature constructed from locally procured limestone and/or brick that had been built over an evaporator hearth or fire. Sometimes remnants of sheet metal evaporator pans are found still lining the trough. The trough features average 4 x 12 feet in size.

2. Platform-type features were a variation of the evaporator hearths in association with elevated stone platforms, measuring three to four feet above ground surface, and as long as 30 feet. The platform type sites functioned to provide gravity-feed to the evaporator pans.
3. The ramp type features consist of earthen ramps about 12 feet wide, five feet high, and up to 60 feet long. The ramp was accessible from both ends and sloped on both sides, but an evaporator hearth was located only on one side. Some of the ramps had been reinforced with concrete and all were found in association with structures. The ramps could provide an off-loading area for sugar water next to a sugar house/shack.
4. Maple sap processing complexes include sugar houses and typically were part of farmsteads. Foundations or architectural artifacts were often associated with complexes.

One of the two sites in Indiana with archaeological evidence of maple sap processing is located in Morgan County (12MO1345) (Baltz and McCord 2012). The sugar camp was part of a farmstead dating between the mid-nineteenth and mid-twentieth centuries. Based on the artifacts recovered and the chain of title, maple processing at Site 12MO1345 likely occurred between 1885 and the 1930s. Most of the spiles are stamped with a patent date of 1884, so production would post date 1884. If a sugarhouse was present, no archaeological features were encountered to confirm it. The large quantity of nails and other architectural remains recovered from the area suggests a frame structure may have existed at the location. Unfortunately, a thermal trough feature is the only intact feature of the sugar camp remaining. The linear thermal feature was lined with limestone. Metal grates found in association would have served as arches to support flat-bottomed evaporating pans. No additional stonework, such as furnace walls were identified. The metal grates, cast-iron spiles, and spile hooks were the only artifacts recovered from the area that were specifically identified with sap processing [Figure 4].

Figure 4: 12MO1345 spiles – Image courtesy of Gray & Pape, Inc.

Maple sugar or syrup production was not referenced in the historical research for the farmstead property. Maple processing is not referred to in detail in Monroe County histories, but Blanchard (1884:652) does note that William Stone, a resident of Van Buren Township, produced 700 to 800 pounds of maple sugar every spring. It was a common practice of northern farmers to supplement their income with maple processing during the off-season (Keener et al. 2010:134). Typically, this was a familial task with each farmstead processing their own. If the practice was so common on farmsteads in Monroe County, it might explain the lack of historical documentation.

Table 1 provides the relative importance of maple sugar and maple syrup production in Indiana compared to the rest of the country between 1840 and 1930. Indiana was never a large producer of maple sugar. In 1860, Indiana was the eighth largest producer for maple sugar and in 1870 was the seventh largest producer. Maple sugar production peaked in 1860 for the nation, but Indiana had already peaked in 1850. As the nation turned to maple syrup production, Indiana was ahead of the trend. In 1860 and 1870, Indiana was the second- largest producing state for maple syrup and the third largest producing state in 1880 (Bryan 1937). Indiana stayed in the top six states for maple syrup production through 1920.

Table 1. Maple Sugar and Maple Syrup Production in Indiana Compared to the United States						
	Indiana				United States	
	Maple Sugar (pounds)	Maple Syrup (gallons)	Percentage Sugar	Percentage Syrup	Maple Sugar	Maple Syrup
1840	3,727,795*	--	2.4%	--	155,100,809*	--
1850	2,921,192	180,335*	8.5%	1.4%	34,253,436	12,700,896*
1860	1,541,761	292,908	3.8%	18.3%	40,120,205	1,597,589
1870	1,332,332	227,880	4.7%	24.7%	28,443,645	921,057
1880	235,117	242,084	0.6%	13.5%	36,576,061	1,796,048
1890	67,329	180,702	0.2%	8.0%	32,952,927	2,258,376
1900	51,900	179,576	0.4%	8.7%	11,928,770	2,056,611
1910	33,419	273,728	0.2%	6.7%	14,060,206	4,106,418
1920	14,487	167,360	0.1%	4.8%	9,691,854	3,507,745
1930	11,205	41,123	0.8%	1.8%	1,341,491	2,341,015
*No distinction of maple or cane product						
Table compiled from Bryan 1937, Haskell and Smith 1843, Walker 1872						

Maple syrup production still is important to Indiana. According to the DNR Department of Forestry, there were 200 producers in the state in 2020, https://www.in.gov/dnr/forestry/files/fo-maple_syrup_report_2020.pdf. The National Maple Syrup Festival is held in Indiana. The maple syrup industry was important to Indiana and there should be evidence of production on many nineteenth and twentieth century farmsteads, but archaeological investigations of maple sap processing sites are lacking.

References

Baltz, Christopher J. and Beth McCord
2012 Phase II Archaeological Investigations at Site 12Mo1345 in Van Buren Township, Monroe County, Indiana, I-69 Corridor Tier 2 Studies Evansville to Indianapolis. Gray & Pape Inc., Indianapolis, Indiana.

Blanchard, Charles, ed.
1884 Counties of Morgan, Monroe and Brown, Indiana, Historical and Biographical. F.A. Battey & Co., Chicago.

Bryan, A. Hugh
1937 Production of Maple Sirup and Sugar. US Department of Agriculture, Farmers' Bulletin No. 1366, Washington D.C.

Haskel, Daniel and J. Calvin Smith
1843 Descriptive and Statistical Gazetteer of the United States of America, Containing a Particular Description of the States, Territories, Counties, Districts, Parishes, Cities, Towns and Villages – Mountains, Rivers, Lakes, Canals and Railroads; with an Abstract of the Census and Statistics of 1840. Sherman and Smith, New York.

Keener, Craig S., Stephen C. Gordon and Kevin Nye
2010 Uncovering a Mid-Nineteenth Century Maple Sugar Camp and Stone Furnace at the Petticrew-Taylor Farmstead in Southwest Ohio. Midcontinental Journal of Archaeology 35(2):133-166.

Kennedy, Joseph C.G.
1864 Agriculture of the United State in 1860; Compiled from the Original Returns of the Eighth Census. Government Printing Office, Washington D.C.

Nearing, Helen, and Scott Nearing
1970 The Maple Sugar Book. Schocken Books, New York. University of Vermont Libraries

University of Vermont Libraries
2023 Maple Research Guide. https://researchguides.uvm.edu/c.php?g=290518&p=1936099
Accessed June 15, 2023.

Walker, Francis A.
1872 A Compendium of the Ninth Census (June 1, 1870). Government Printing Office,
Washington, D.C.