

## **“to erect a large Distillery:” An Architectural Reconstruction**

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*Abstract: Although they would not peak in popularity for another two decades, by 1800 whiskey distilleries were emerging as an industrial component of early America. Involving an intricate system of tubs, troughs and stills, Washington’s distilling operation was assembled in a large sandstone building, constructed for that purpose. Washington required his plantation manager to submit meticulous weekly reports of each task undertaken at the plantation. These documents provide a level of detail about the construction of the building, as well as the components of the distilling system, unique for most archaeological projects. This paper utilizes these documentary sources, as well as other period documents to elucidate the appearance of the still house through an understanding of the process of distillation.*

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“Mr. Anderson has engaged me in a distillery, on a small scale, and is very desirous of encreasing it: assuring me from his own experience in this country and in Europe, that I shall find my account in it...” wrote George Washington in a letter to his friend John Fitzgerald in June of 1797. Rapidly George Washington’s Distillery did expand, under the eye of his plantation manager James Anderson, from a small-scale enterprise carried out in the retrofitted cooperage, to an industrial operation in a new 30-by-75-foot stone distillery. When James Anderson proposed to George Washington that the distillery be enlarged, he obviously had a good idea how the entire operation would function, as well as what type of building would house the new distillery. The documentation that exists, including farm reports, ledgers, and letters specific to George Washington’s distilling endeavor provides a unique opportunity to view a rich and

detailed written account of this building's construction. James Anderson's distilling knowledge, imported from Scotland to the United States, provides the technological backdrop for this whiskey making business. We can infer what Anderson knew about distilling through the information contained about the processes in early 19<sup>th</sup>-century distilling manuals.

All of this data, taken into the context of what is known about the size and scale of George Washington's Distillery, offers an unparalleled opportunity to assess the building's construction sequence and to bring these details to life in an interpretive reconstruction. Through a chronological review of the documentary sources, combined with what is known about the distilling process, this paper proposes an architectural model for George Washington's Distillery – one that takes into account the industrial scale at which the distillery was operating. The graph in this slide traces the timeframe of the building's construction by the amount of labor represented in man-days, overlain by the various construction phases. This graph will repeat at the bottom of the screen as we reconstruct the distillery from the documentary evidence. This paper seeks to create an industrial building within the grammar of 18<sup>th</sup>-century Chesapeake architectural forms.

Understanding the distilling process itself is crucial to deciphering the documentary and archaeological clues to discover how early American distilleries were designed and operated. Whiskey distilleries proliferated on the American landscape during the late eighteenth and early nineteenth centuries. As the process of distilling became industrialized, the technology for distilling equipment improved, distillers' professionalism increased, and how-to manuals were published to introduce the layman

to the proper methods for distilling whiskey. These manuals offer a prescriptive view of the processes involved and equipment necessary for entering into the distilling business. Background research identified three early American distilling manuals, all published by distillers in Pennsylvania: *The American Distiller* by Michael Krafft written in 1804, *The Practical Distiller* by Samuel M'Harry written in ca. 1809, and *The Distiller* by Harrison Hall written in 1818. These provide general information relating to the process of distilling.

From grain accounts we know that George Washington's whiskey combined 60% rye, 35% corn, and 5% malted barley. Barley, saturated with water was forced to sprout. When the new sprout was as long as the grain, it was spread very thin and heated in a malt kiln to stop this germination. The kiln channeled hot air in a flue, heating the grain that sat on a sheet of iron pierced with tiny holes. Once dry, the malt, rye and corn were ground in a gristmill.

The next step in the process, mashing, combined the grain, and hot and cold water, transforming the natural starch present in the grain to sugar. This occurred in large hogsheads or mash tubs. In Washington's time, yeast was added directly to the mash tub. During this fermentation period the yeast converts the sugar to alcohol, in about 3 – 5 days.

Distillation separated the alcohol from this mixture. The stills were charged, or filled with mash, and fires lit in the furnaces beneath. When the mash was heated to 160 degrees, the boiling point of alcohol, the alcohol evaporated and traveled up the arm of the still into the attached worm tube. As the vapors moved through the spiral-shaped worm tube, cold water flowing around the tube condensed the alcohol back into

a liquid. This distillate could be re-distilled a number of times to increase the proof and remove impurities. Slop, the grain mixture left in the still after the evaporation of the alcohol, was fed to livestock. Distillers benefited from the sale of these slop-fattened hogs and cattle.

While Washington had owned a still since the early 1760s, there is no indication grain was distilled at Mount Vernon prior to the arrival of James Anderson in January 1797. The first distillery, set up in the cooperage within a matter of weeks, was probably typical of how many distillers operated during the late 18<sup>th</sup> and early 19<sup>th</sup> centuries. Farmer-distillers operated one or two stills for only a month or two annually; they worked in sheds and outbuildings, making and dismantling the operation relatively easily. While these small distillers may have sold some of their product, they were not distilling more than their own grain.

Even with the makeshift distillery located in the retrofitted cooperage a number of alterations made the operation more permanent. According to Mount Vernon records, water from the millrace entered overhead and exited the worm tubs via underground drains. The two copper pot stills were mortared into brick furnaces, something all distilling manuals and period depictions illustrate. These modifications to the cooperage show that even at a small level, distilling called for some specialized features.

Merchant-distillers, or those distillers producing whiskey from purchased grain, constructed still houses with increased specialization to drive large, efficient operations. Anderson began lobbying Washington for such a building just a few months after the two stills were fired up in the retrofitted cooperage. The still house built in late 1797 and early 1798 was one of these specialized structures, specifically planned and

constructed to house a commercial distillery. Therefore, many of its characteristics are industrial and not domestic in nature—differing from most of the other plantation structures, and illustrating Washington’s willingness to create rather than adapt.

Early 19<sup>th</sup>-century manuals suggest stone construction for fire prevention and climate control. Perhaps Washington was checking the availability of stone when he rode to Great Falls on July 19<sup>th</sup>, his first visit to the area in almost a decade. By September he had decided to build the still house out of stone, as he instructed his secretary Tobias Lear to price foundation stone from this area.

Construction of the building began the first week of October, and the weekly farm reports document the labor-intensive effort and quick time frame within which the distillery appeared during the winter of 1797-98. Within two weeks the large river cobbles were being delivered to the building site. Thomas Patten, an Alexandria merchant charged 7 pounds 15 for bringing 31 perch of stone from Little Falls to Dogue Run. The bricklayers, slaves Tom Davis and Muckles, and miller Ben ferried them up the shallower creek in a scow.

The Mount Vernon quarry was in full operation between October 28<sup>th</sup> and December 16<sup>th</sup>, and this stone arrived at the site by any available method – the scow brought stone by water while the 3-mule and 2-mule carts, as well as miscellaneous farm carts, brought the 100 perch of stone needed for the construction of the walls. Actual construction of the foundation and walls was not as inexpensive or simple as Anderson had proposed. He had assured Washington that *“The building of a Still house a small malting house & Kiln, I could not well estimate—our own people will do the whole excepting setting up the Stills...”* James Keating, an Alexandria stone mason,

was on site from October 28<sup>th</sup> through December 16<sup>th</sup> when the masonry construction was completed. He charged 40 pounds 16 and received part of his payment weekly in the form of middlings and meal from the gristmill, the remainder in cash. Anthony, a Mount Vernon slave, assisted him, although the short construction period suggests he had his own crew working with him as well. The foundation was completed in two weeks, while the walls took eight weeks.

The physical remains of this building illustrate the massive nature of the construction and provide a perspective from which to analyze the building period. Individual foundation stones measure up to two feet, while the dry-laid foundation varies between 3 feet along the western wall and 3.5 feet along the southern wall. A layer of schist acted as a leveling course, providing a base for the sandstone walls, which were 2 feet wide.

Given the quick construction, the masonry was probably very simple in finish and detail; yet, the layout of the distilling equipment was deliberate and well planned, even as the building emerged. Between completion of the foundation and the commencement of the walls, the Farm Reports record *“Fixing of 5 troughs under ground to carry the water from the Worm tubs.”* This suggests that the plan for the placement of the worm tubs, and therefore the drainage systems and still locations, were well in hand as construction began. The level of forethought and investment in the distillery is illustrated by the fact that the water leaving the worm tubs exited through the foundation rather than above ground.

As the stone work progressed, the Mount Vernon carpenters were engaged in preparing the framing. The roof was probably 4 inch by 3-inch common rafters

supported with collars spanning each rafter pair, and these were constructed during December. This optimized the storage and living space in the loft and is seen on surviving Mount Vernon buildings. Shingling began the week before Christmas and was finished January 20<sup>th</sup>. The account ledger records the purchase of the 8000 shingles from Alexandria merchants Harper and Davies on December 23<sup>rd</sup>, 29<sup>th</sup>, and January 2<sup>nd</sup>, 1798 for 14 pounds 20.

One reference from this period to “*Studding up the front gable end of the still house,*” is interpreted as evidence that the distillery had a large cross gable, similar to Mount Vernon’s stable, built 15 years before. This feature probably housed a pulley system to haul grain up to the loft where it was stored.

With the completion of the roof, work shifted to the exterior of the building – sculpting the landscape to enable the water to flow into and through the structure, and inside – finishing the structural details and constructing the distilling apparatus.

On January 13<sup>th</sup> an unnamed carter drove the “wagon hauling stills from town.” This wagon probably also contained the boiler. George McMunn, an Alexandria copper and whitesmith who specialized in still manufacturing, fabricated all four items. These three stills joined two purchased the previous January creating a five still distillery, with a total capacity of 616 gallons, extremely large for the period. Masons Tom Davis and Muckles began work immediately bricking them into furnaces, a task which took five weeks.

The water system, bringing water into and through the building, both for the mashing process and the worm tubs, had above and below ground components. Water from the nearby millrace entered the building overhead via standards, wooden posts to

support wooden troughs. The trough system was fabricated the week of February 4<sup>th</sup>, pitched and caulked so gravity could channel the water throughout the process eliminating the need for extensive pumping or carrying.

Cooper Tom completed the worm tubs during the same week and these were supplied with fresh water via small troughs running from the main water system. Water ran through similar small troughs to exit the worm, although these were below ground, and utilized the voids built into the foundation during construction. This water fed into a below ground covered wooden drain and emptied into Dogue Creek. The water system was completed during the week of February 18<sup>th</sup>.

The availability of sufficient water probably posed the greatest challenge to the operation. By late spring, competition between the mill and distillery strained the water system and a well was dug and fitted with a pump to bring water into the distillery. Later during the summer, drainage problems surfaced and in September the floors were ripped up and the trough covers removed to repair and replace these components.

Another above ground trough group, also constructed during February, channeled the slop from the stills into oak slop coolers located outside the structure. A fence around these coolers protected the hot liquid while it cooled and this was then fed into the extensive system of troughs within the livestock sheds.

During February, as the distilling system was calibrated on the ground floor, work began in the loft. Although the majority of the loft was utilized as a grain storage area, the level of finish was quite good. A wooden floor was laid throughout, and two rooms over the cellar, presumably domestic space for John Anderson, the distiller, and his assistant Peter Bingle, had closets and baseboards. The domestic space may also

have housed the slaves working at the distillery, but there is no documentary record of where these six men resided.

Distilling commenced the last week of February, immediately after the floor was finished. From this date on, the building operated while work continued -- refining spaces and constructing details such as storage bins. All interiors were plastered during March and the physical evidence suggests this plaster was a very thin mixture applied to the stone walls almost like a whitewash.

With whiskey production underway, the cellar was finished, providing a safe place to store the liquor. Washington was particularly cautious about theft and the flammable nature of the product was also a concern. One distilling manual suggests that the cellar or storehouse be "some distance" from the distillery and that all the work be done in the cellar by day for fear of a candle flame igniting the alcohol. The cellar was partitioned, creating a two-part storage area, or perhaps an outer office or counting room and inner store area. The construction of a desk and purchase of a "little book" for \$.50 suggests they were configured in this manner.

The fear of theft probably influenced a design that allowed only limited access to the building. The documentary sources suggest the structure had only two exterior entrances. These doors probably had dead stock locks, permitting access only with a key. Interior doors were hung in March, after the flooring was finished.

The documents refer to four windows built into the building initially, although period texts and images suggest distilleries usually had many more windows. As the weather got warmer, 600 shingles were purchased from Washington's good friend and whiskey salesman George Gilpin. They covered two dormer windows added during the

weeks of June 23<sup>rd</sup> and 30<sup>th</sup>. These were probably situated at the domestic end of the building, to provide ventilation for the distillers living upstairs.

At 75 x 30 feet, the distillery was an imposing feature upon the landscape, but it was not the only structure present at the site. The documentary sources provide evidence of the symbiotic relationships that existed between the distillery and a range of support buildings such as the gristmill, structures for malting grain and livestock sheds.

Anderson's initial plan for a larger distillery included a small malting house and kiln. A foundation for a malt kiln was begun March 10<sup>th</sup> after regular distilling had commenced. In November this structure was completed as well as an 18 x 20 foot malt house. The malt kiln was constructed of brick with a sheet iron surface to lay the germinated grain upon. The coopers and miller Ben fabricated this sheet iron the week of December 8<sup>th</sup> and the first shipment of unmalted barley to the distillery is recorded on December 15<sup>th</sup>, 1798.

Manuals stress the benefits of slop as feed for both pigs and cattle, and this was clearly one of the important selling points for Washington. The pens for livestock were constructed in two phases: cow sheds during the spring of 1798, while the pig sheds were built in the fall.

The farm reports suggest the cow shed was 180 feet long and provided stalls for 39 cows. It is not known how large the pig shed was, although a visitor reported 150 pigs housed at the site. The accommodations were luxurious, with roofs and wooden floors set on sleepers and over 220 feet of troughs for the cooled slop. Krafft goes into detail about the construction of these enclosures: "...his next care is to the building of his pens, which should be a solid floor (plank is best)... The pen, after being a

considerable length should now be divided into a number of lesser ones... Hogs in the stables or pens of a distillery should be kept very clean, for cleanliness begets health..."

From the initial attempts at small scale distilling in the retrofitted cooperage, to an industrial scale operation that produced 11,000 gallons of whiskey in one year, James Anderson successfully fulfilled his desire to expand the level of production at George Washington's Distillery. George Washington wrote: "I have been induced, by the experience and advice of my Manager, Mr. Anderson, to erect a large Distillery at my Mill; and have supplied it with five Stills, Boilers &ca. which, with the (Stone) House, has cost me a considerable Sum already..." The excavation of the foundation began the week of October 14<sup>th</sup>, 1797, the west roof was shingled that Christmas, and the first load of slop was hauled two months later, implying that Anderson, with the support of George Washington, had the building up and running in approximately four and a half months. This fact alone speaks to Anderson's familiarity with the technology of large scale distilling and that he had a plan in mind of how to bring this industry to George Washington's plantation. This paper proposed a model for the distillery as similar to Anderson's vision as possible based on the documentary sources available. Very few standing distilleries from the 18<sup>th</sup>-century exist either in the United States or in James Anderson's country of origin, Scotland. Therefore, the database of architectural prototypes that we can model the reconstructed Distillery after are limited. In order to most accurately propose a reconstruction of George Washington's Distillery, we must put what we know about the nomenclature of late 18<sup>th</sup>-century Chesapeake architecture within the framework of an industrial complex. Unlike domestic structures, whiskey distilleries (as with all industrial sites) are planned and constructed with a technological

process in mind. By integrating the advice given on the process of making whiskey contained in the distilling manuals with the site-specific documentation on the construction sequence, we are able to arrive at a blueprint for the distillery.