MEAN CERAMIC DATES AND CHRONOLOGY

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One of the most fundamental goals of archaeology is to date excavated sites. A sound chronology of a site allows the archaeologist to fully comprehend the data found in the site. There are many different methods of determining a site's chronology, and one of them is mean ceramic dating. In historical sites, the most abundant artifacts are ceramic sherds. These sherds can be identified by their gloss, color, shape and texture. From that typology, the sherds can be dated to a specific time range of production. Then, by using frequencies of the production dates of the ceramics found, it is possible to determine the time range of occupation of a site (Barber 1994). This paper examines the effectiveness of mean ceramic dates by comparing mean ceramic dates (MCD's) to known occupational periods in the Lake of Isles sites. That knowledge can then be applied to the Mashantucket site, which has an unknown chronology in order to identify the occupational periods.

The Lake of Isles sites were Euro-American settlements located just outside of the Mashantucket Pequot reservation in Preston, CT. The Mashantucket sites were Native American settlements inside the Mashantucket Pequot reservation. The Lake of Isles sites had an established chronology based on land deeds and other historical documents. On the other hand, the Mashantucket Pequot sites had no such records and thus the chronology has not yet been clearly defined. The only documented site on the entire reservation from this period was 72-171, which was dated to 1774 (MPMRC 2007).

A lack of records is an obvious problem in understanding the cultural changes that were occurring within the reservation from the 17th century to the present. One method of determining the chronology of the reservation would be to create MCD's for all of the sites. Of course the reliability of these tests then comes into question. Based on the evidence from the Lake of Isles sites, it appears that the overall method of mean ceramic dating is dependable and can be used to form a reliable chronology for the Mashantucket Pequot reservation sites. In order to investigate this properly, the Lake of Isle sites 102-70 and 102-44A are examined to expose the pros and cons of using mean ceramic dates for these sites. Thereafter, the criteria can be applied to the Mashantucket Pequot reservation sites in order to establish a chronology for the reservation (MPMRC 2007).

In relation to the historical documentation for the site 102-70, the MCD is inaccurate. The historical documentation shows that the site was occupied from 1758 to 1770. Theoretically, this means that the MCD should be 1764. However, the mean ceramic date is 1776 (+/- 15.9 yrs), and this date does not even lie within the documented years of occupation. Interestingly, even though the mean ceramic date appears to be inaccurate, the MCD 2 sigma range of 102-70 is from 1744 to 1807. Although that range extends a bit beyond the actual range of occupation, it still wholly encapsulates the sites occupation. This range is entirely more reliable and representative of the site than the mean ceramic date itself (MPMRC 2007).

Another site that the mean ceramic date does seem to accurately measure is the site 102-44A. This site was occupied from 1769 to 1890 as demonstrated by the historical documentation, with a mean date of 1829.5. The mean ceramic date is 1820 (+/- 30.87 yrs) and is entirely more accurate for this site than 102-70. Again, the MCD 2 sigma range also encapsulates the occupation range, but this time more closely, with a range of 1758 to 1882 (MPMRC 2007). From these sites, it is apparent that mean ceramic dates are only useful when the sites have long occupational periods and a large variety of tightly dated ceramics. 102-70 was occupied for a short period of time and still contained a larger quantity of ceramics than the better dated 102-44A. This means that the mean ceramic dating technique cannot be reliable for a site that was in use for a short period of time, even if the total ceramic number was high. For example, 102-44A was used for a much greater period of time than 102-70 and as a result, the MCD was much closer to the actual mean date of the site. That is not because there were more sherds, but rather because the site was exposed to a larger variety of tightly dated ceramic types.

The inaccurate ceramic date in 102-70 may be due to a number of things. It could be that the ceramics found at the site were either bought after the production period, or the ceramics had a long curation period. These two problems are common with mean ceramic dates. The problems arise from the fact that the date ranges given for ceramic types are of production ranges, and not based on availability to the people in the area, let alone when they were acquired. That difference creates a time lag in the MCD. Also, once acquired, there is no way to tell how long the vessel was used before it was discarded (Barber 1994). In regard to these sites, there is probably a time lag of only a few years (two to three), because these sites seemed to acquire the ceramics at a fairly uniform and timely manner, which has reflected itself in the data (Figure 4).

Unfortunately, pipe stem chronologies cannot be used in these sites to supplement the mean ceramic dates because of the low number of pipe stems. In order to have a reliable pipe stem date, a sample of at least 250 pipe stems is needed.

Both the Lake of Isles and Mashantucket Pequot sites have very small samples, making a reliable date impossible. For example, 102-44B had 11 pipe stem fragments, with a date of 1735 (+/- 22.36). According to the historical documents, the occupational period was from 1739 to 1788. This demonstrates the unreliability of pipe stem dates for these sites (MPMRC 2007).

In order to better understand the large volume of data, as well as to create more accurate data, three types of ceramics were isolated to best represent the occupational periods of the sites. Creamware, Pearlware, and Whiteware were chosen because of their specific production periods and availability in New England from the establishment of the reservation to 1900. These ceramics had well defined benchmarks or identifiable periods of production that could best identify the age and chronology of the sites. Creamware was produced from 1762 to 1820, Pearlware from 1775 to 1840, and Whiteware from 1820 to 1900. Depending upon when the site was occupied, some of these ceramics would be present and some would not. This allows the sites to be specifically placed within more precise time ranges (Hume 2001).

The availability and chronology of those ceramic types appear in frequency seriations taken from each area. The idea behind seriations is that types of ceramics would initially increase and finally decrease in popularity, creating a bell curve in assemblages over time. The seriations from both areas are almost identical and show that the Lake of Isles sites (Figure 2) and Mashantucket Pequot sites (Figure 3) had some correlations between the types of ceramics that were available to them and what they were buying (Sutton 2005). In fact, it appears that the inhabitants of both sites were buying the exact same things at almost the same time. Interestingly enough, this indicates that both groups had equal access and desire for the same ceramics.

The data was then divided up into the percentages of each ceramic (Cream/ White/ Pearlware) found in each archaeological area and then plotted on a graph of each whole site. It appears from this data that both the Lake of Isles sites and Mashantucket Pequot sites had access to the same ceramics and received them about the same time (Figure 4). That fact alone explains a lot about the relationship between the Mashantucket Pequots and the Euro-Americans. It shows that the Native Americans sought after Euro-American goods. They had even adopted the Euro-American tea ceremony into their own lives. More importantly, it shows that the MCD's must also be somewhat reliable for the Mashantucket Pequot sites. This is because the Mashantucket Pequot assemblages follow the same consumer patterns as the Lake of Isles sites.

If the MCD's are a good indicator of occupation, it may be possible to determine the occupational ranges of a number of the Mashantucket Pequot sites. It appears from the Lake of Isles sites that the best way to determine occupational ranges for a site would be to use the MCD 2 sigma ranges in conjunction with observing the seriations of the three refined wares outlined above. The MCD 2 sigma ranges were consistently closest to what the real occupational periods were, and with information from the three refined wares, a substantial amount of information can be gleaned from the sites (MPMRC 2007).

However, these ranges are only reliable when the ceramic assemblages are moderately large in the refined wares for the site. Many of the Mashantucket Pequot sites have few ceramics, especially refined wares. For example, the site 72-209 had only ten ceramics in the entire assemblage, seven of which were untyped, utilitarian wares and yielded little information about the site. That site in particular had a MCD 2 sigma range of 140 years, which is most likely incorrect. Ceramics like the utilitarian Red Earthenware, which had a production range of 130 years, had a tendency to throw off the data in 72-209. The MCD 2 sigma ranges cannot be determined from these smaller assemblages because the assemblages lack solid indicators of occupational periods, especially when they are comprised of untyped and utilitarian ceramics (MPMRC 2007).

One Mashantucket Pequot site that most likely has a reliable mean ceramic date is 72-70B. The site contains all of the necessary elements to make the date trustworthy. First of all, there is a fairly large overall quantity, so the site was probably occupied for an extended period of time, but more importantly it contains a large variety of refined wares and other tightly dated ceramics. Also, the standard deviation is lower on this site, which is another good sign of a reliable occupation range. The MCD is 1797 (+/- 11.18) and the occupation of the site was probably, as the MCD 2 sigma range suggests, from 1775 to 1820. Of course this time frame should be supplemented with further information, including a more comprehensive knowledge of the stratigraphy of the site, as well as additional dating methods (MPMRC 2007).

The simple explanation for the low total ceramic counts is that most of the Mashantucket Pequot sites were inhabited for shorter periods of time than the Lake of Isles sites. Common sense would suggest that sites which had been inhabited for shorter time periods would have smaller assemblages than longer occupied sites. However, that does not appear to be the case. For example, the Lake of Isles site 102-44A has the longest documented range of occupation out of the other Lake of isles sites (from 1769 to 1890). Yet 102-44A is the fifth highest in the total number of ceramics out of the thirteen Lake of Isles sites. This means that there is not a direct correlation between the quantity of ceramics and the duration of

occupation at these sites. Another reason for the smaller number of ceramics at the Mashantucket sites may be due to the socio-economic difference between the Mashantucket Pequot and Lake of Isles sites. The Mashantucket Pequots had less economic security than the inhabitants of the Lake of Isles sites. Therefore, the inhabitants of the Lake of Isles sites would not only be able to buy better quality goods, but also larger quantities of those better ceramics (MPMRC 2007).

Overall, mean ceramic dates appear to be a good way to get a basic understanding of the chronology of sites. However, it is apparent that mean ceramic dates can only be reliable if specific criteria are met by each assemblage. Accurate MCD's must have large number of ceramics, with a number of tightly dated ceramics. Also, only the MCD 2 sigma ranges, with low standard deviations can be used with confidence. Most importantly, MCD's have to be used in conjunction with other dating methods, as well as a keen understanding of the sites and their stratigraphy. The chronology of the Mashantucket Pequot sites seems to be contemporaneous with the Lake of Isles sites and both had almost identical consumer patterns. This demonstrates the level of acculturation in the Mashantucket Pequot reservation from around 1764 to 1849, as well as the effectiveness of mean ceramic dates in establishing the chronologies for those sites.

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Lake of Isles Sites (Figure 1)

Site	MCD	Cream	%	Pearl	%	White	%
102-44B	1767	36	23%	0	0%	0	0%
102-62	1770	63	17%	0	0%	0	0%
102-70	1776	661	57%	0	0%	0	0%
102-58	1787	32	68%	5	11%	0	0%
102-49B	1790	537	86%	28	4%	0	0%
102-65	1792	2103	78%	347	13%	0	0%
102-50	1798	387	58%	273	41%	2	0%
102-69	1799	2322	46%	2522	49%	14	0%
102-59	1806	614	20%	2173	70%	145	5%
102-44A	1820	317	26%	424	35%	409	33%
102-63	1820	285	15%	757	41%	628	34%
102-48	1832	7	1%	302	51%	281	47%
102-67	1837	21	6%	133	35%	220	58%

Mashantucket Sites

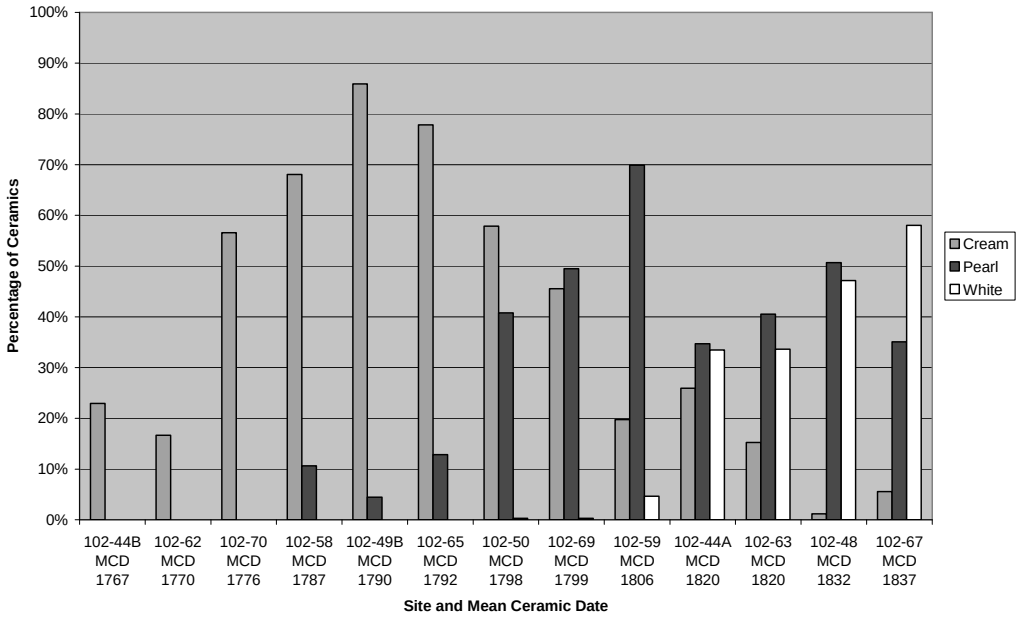
Site	MCD	Cream	%	Pearl	%	White	%
72-58	1764	1	1%	0	0%	0	0%
72-171	1767	115	24%	1	0%	0	0%
72-70A	1786	97	36%	85	32%	0	0%
72-41	1790	112	82%	1	1%	0	0%
72-66	1790	4395	88%	44	1%	0	0%
72-97C	1791	374	98%	0	0%	0	0%
72-161	1791	6257	90%	254	4%	0	0%
72-91	1794	4259	75%	1371	24%	0	0%
72-165	1794	33	73%	12	27%	0	0%
72-70B	1797	2171	43%	2264	45%	4	0%
72-88	1804	72	62%	17	15%	16	14%
72-38	1817	16	21%	22	29%	28	37%
72-209	1833	2	20%	1	10%	5	50%
72-226	1838	13	9%	37	25%	91	62%
72-37	1841	213	25%	28	3%	582	68%
72-120	1849	5	8%	6	10%	51	81%

Figure 1 (continued)

Salt Glazed Stone	%	Other Stone	%	Earthen	%	Delft	%	Other	%	Total
70	45%	0	0%	17	11%	4	4%	26	17%	157
101	27%	0	0%	137	36%	0	2%	77	20%	378
326	28%	27	2%	40	3%	2	1%	112	10%	1168
8	17%	1	2%	1	2%	0	13 %	0	0%	47
17	3%	0	0%	37	6%	0	1%	6	1%	625
56	2%	0	0%	165	6%	0	0%	30	1%	2701
1	0%	0	0%	5	1%	0	1%	1	0%	669
10	0%	0	0%	186	4%	0	0%	44	1%	5098
12	0%	8	0%	150	5%	0	0%	7	0%	3109
9	1%	6	0%	42	3%	0	0%	15	1%	1222
1	0%	6	0%	183	10%	0	0%	1	0%	1867
0	0%	0	0%	6	1%	0	1%	0	0%	596
1	0%	0	0%	2	1%	0	2%	2	1%	379

Salt Glazed Stone	%	Other Stone	%	Earthen	%	Delft	%	Other	%	Total
88	94%	0	23%	4	0%	0	0%	1	1%	94
144	30%	8	5%	84	0%	0	0%	130	27%	482
39	15%	3	8%	25	0%	0	0%	19	7%	268
0	0%	0	16%	21	0%	0	0%	3	2%	137
43	1%	0	0%	509	0%	2	0%	22	0%	5015
1	0%	0	6%	4	0%	0	0%	1	0%	380
2	0%	0	0%	381	0%	0	0%	37	1%	6931
7	0%	5	0%	18	0%	0	0%	14	0%	5674
0	0%	0	49%	0	0%	0	0%	0	0%	45
32	1%	28	0%	518	0%	0	0%	28	1%	5019
1	1%	2	19%	9	0%	0	0%	2	2%	117
2	3%	1	29%	6	0%	0	0%	1	1%	75
0	0%	1	220 %	1	0%	0	0%	1	10%	10
2	1%	0	15%	1	0%	0	0%	0	0%	146
8	1%	20	3%	1	0%	0	0%	20	2%	852
0	0%	0	35%	1	0%	0	0%	0	0%	63

Ceramic Percentages by Lake of Isles Site (Figure 2)



Ceramic Percentages by Mashantucket Pequot (Figure 3)