Following the Yellow Brick Road: The DAACS-Munsell Color Range System
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[Slide #1: Mulberry Row] Non-standardization of terms and measurements has long been a major roadblock in the attempt to produce regional studies using multiple sites excavated by different archaeologists. Even when people speak the same language, clear communication can be difficult and potentially confusing; add to this the fact that most archaeologists work independently of each other. The dilemma of non-standardization extends even to something as ubiquitous as describing color. The need to standardize color in this study stems from the attempt to name colors seen on artifacts without subjectivity. Regional studies and inter-site comparisons of applied colors on ceramic wares, especially in reference to specific stylistic elements and consumer choice are inhibited due to subjective classification of color. In this paper we will introduce the DAACS-Munsell Color Range System and discuss the methodology behind the Digital Archaeological Archive of Chesapeake Slavery's standardization of color terms.

We will also present findings relating to two research questions about color on ceramics and consumer choice. We first looked at whether time accounts for the great variability in glaze color on creamware. Is it true that the earliest creamware has a darker yellow glaze than later creamware? Next, we looked to see what sort of influences played a role in the consumer's choice of colors used for hand-painted decorations on pearlware.

The DAACS-Munsell Color Range System is an adaptation of the Munsell system of color notation. The Munsell color space is a three-dimensional, geometric ordering of color using the terms: hue, value, and chroma. [Slide #2 Munsell color space] Hue refers to the quality that distinguishes red from yellow, yellow from blue, and so on; value measures lightness; and chroma measures the purity of the color, in other words, how far away from gray that color is. Hue is measured by the position on the circle that a color occupies. Value is measured by a color's proximity to white or black and chroma is measured by a color's distance from gray.

The initial design of the DAACS-MCRS was to group colors according to "common" everyday color terms; for instance "red," "blue," "orange," "yellow." It quickly became apparent that not only could Jesse and I not agree on tight classifications for common colors, neither could anyone else in the Monticello archaeology department. This is because how one interprets color depends on many variables, from the type of light reflected from an object, to the biological properties of the viewer's eyes and nervous system, to the past psychological experience of the observer. For example, we could not agree on the same range of colors to be called purple. My definition of purple was bluer than Jesse's, who favored a redder tinge. Due to each individual's unique perspective of color, this color system was too subjective.

In an effort to eliminate the subjectivity of the original design, we turned to the Munsell color notation codes as the primary factor for our color ranges. The DAACS-MCRS is an abbreviated version of the published Munsell colors. The same attributes used to divide up the Munsell color space (hue, value, and chroma) were used to create the DAACS-MCRS. We first divided the Munsell color space according to hue. Within

each hue, another division was made according to chroma into muted and intense. Finally, the colors were separated into light, medium, and dark according to value.

What group a particular color is a part of is based on its position in the Munsell color space. For example, the color 2.5Y 9/4 is in the 'Muted Light Yellow' color range. The hue designation 'Y' tells you that it is yellow. [Slide #3 showing yellow pages – point out 2.5Y] The value, '9,' indicates that the color is a light yellow. [Slide #4 highlighting 'light' section of page, i.e. show only color chips with value of 7 or higher] Finally, a chroma of '4' specifies that the color is muted. [Slide #5 highlighting 'muted' section with 2.5Y 9/4 with red x] After recording the color notation for every color chip chosen to represent the range of each color descriptor, our final product looks like this: [Slide #6 showing Red Munsell chips in slide sheets]

In addition, we created a separate color sheet to encompass exterior and interior glaze colors for refined earthenwares, porcelain, and white salt-glazed stoneware. This was done because the abridged Munsell color range created by the DAACS-MCRS still failed to have a group of colors that matched these specific ware types. A separate glaze color sheet, which is used for the vast majority of ceramics on historic Chesapeake sites, helps to expedite the cataloging process by eliminating the need to flip through the larger color book to find the appropriate color range for light neutral-colored wares. [Slide #7 showing Glaze colors]

The data generated by this color naming system, was used to catalog two slave quarter sites, Building *o* and Building *l.* Both sites are located on Mulberry Row, the center of industrial activity for Thomas Jefferson's Monticello plantation [Slide #8 showing plan drawing of Building *o*] Building *o* was excavated between 1979 and 1983

using a number of different methods of excavation and data recording. The site was a slave dwelling and most likely was composed of at least two distinct structures during Jefferson's lifetime.

[Slide #9 showing plan drawing of Building *l*] Building *l* was first excavated in the summer of 1957. And over the next thirty years was the subject of a number of follow-up excavations. The site was reassessed in the late 1990s to better determine the functions of the structure during Jefferson's lifetime. Building *l* had numerous functions that appear to be simultaneous: slave dwelling; nail-making and blacksmithing operation; and, according to Jefferson, an iron storehouse for the nailery located near by.

We decided to put the DAACS-MCRS to the test by looking at color usage on creamware and pearlware, which are perhaps the two most prolific ceramics on Anglo-American archaeological sites. Since the majority of decoration found on creamware is molded decoration, we tested a long-held hypothesis regarding glaze color. With pearlware, most decoration is achieved through applied color, which allowed us to look at how color influences consumer choice in greater detail.

Noel Hume once said of creamware that "as a general guide it may be assumed that the earliest pieces are of a deeper yellow than are the later and that the difference has become pronounced by about 1785" (A Guide to Artifacts of Colonial America, p.126). Using correspondence analysis, lithostratigraphic groups for building *o* and *l* were divided into six temporal phases. These temporal phases were used to evaluate the hypothesis that creamware glaze color gets lighter through time. We seriated 2317 creamware sherds according to glaze color. The two thousand-plus sherds are all the creamware sherds from Building *o* and *l* combined. We looked at exterior and interior

glaze color separately. [Slide #10 of all of *o* & *l*] The results, however, were the same. The whitest color (10Y 9/1) occurred with the second highest frequency in the last two phases. The darkest yellow (2.5Y 8.5/4) had its highest rate of occurrence in phases 2 and 3. According to Hume, the distinction between dark and light creamwares should be evident by 1785; since occupation of Building *o* begins around 1787 and *l* circa 1789, it's possible that only the tail-end of the trend to whiter creamware is visible. It is likely that the slaves living at Building *o* kept and reused their ceramics even after they were chipped and cracked. More data from older sites are needed to confidently say whether or not glaze color variation is determined most by consumer choice, reflected in change over time and space or by other factors such as the inability to control firing conditions.

We next looked at glaze color through time within each site. Out of the 2317 creamware sherds used for this study, 1983, or 85%, came from Bldg. *o*. The remaining 334 sherds came from Bldg *l*. [Slide #11 of seriation of Bldg *o*] In Bldg. *o* there were virtually no creamware sherds of the whitest color (10Y 9/1) while the darkest yellow (2.5Y 8.5/4) was evenly distributed through all Bldg. *o* phases. [Slide #12 of seriation of Bldg *l*] Bldg. *l* had a large percentage of 10Y 9/1 creamware sherds with practically no 2.5Y 8.5/4 creamware sherds. It is interesting to point out that the only occurrence of the darkest yellow on creamware in Bldg. *l* is in phase six. Perhaps this indicates a presence of new occupants who have brought their old dinner and teaware with them.

Finally, we looked at changes in glaze color at Bldg. *o* versus *l* while controlling for time. The only successive phases where creamware was found on both sites are phases four and five. [Slide #13 of seriation of Bldg *o* & *l* during phase 4] During phase four, you can see that Bldg. *l* has ALL of the whitest creamware vessels, while the same

holds true of Bldg. *o* in regards to the deepest yellow creamware vessels. This pattern occurs in phase 5 as well. [Slide #14 of seriation of Bldg *o* & *l* during phase 5] The reason for this could be that Bldg. *o* was used as living space while Bldg. *l* changed into a dwelling only later in its occupational lifespan. The occupants of Bldg. *o* would have received and/or purchased their ceramics over a longer time span and therefore would have been consumers when the deepest yellow creamware became available to the world-market. The one definitive conclusion we can make is that glaze color on creamware played little to no part in the selection made by the ceramics' users at these two sites. Future research could tackle whether other aspects, like decoration and function, are more of a driving force in the acquisition of creamware vessels.

We will now turn our focus to the use of the DAACS-MCRS in analyzing applied color on ceramics. In particular, to study the pattern of applied color on hand-painted pearlware from Building *o* and *l*.

We looked only at the relative frequency of applied color on pearlware because of the small sample size available. Building *l* had 235 hand-painted underglaze pearlware sherds and Building *o* had 554. [Slide #15 Graph of pearlware only]. Our initial study calculated the relative frequencies of all the hand-painted pearlwares from both sites combined. Immediately, we were struck by the high frequency of the purple-blues hues, which tallied together to make up almost 55% of the entire color palette. The pearlware assemblages for Building *o* and *l* were dominated by purple-blue decorations. [Slide #16 of Purple Blue hues] Only about 45% of the painted pearlware assemblages were decorated with other colors, such as green and yellow [Slide #17 of green-hues].

Our next step was to analyze the applied decorative color according to site. [Slide #18 Graph of Building *o* and *l*] Almost 65% of Building *o*'s pearlware color palette is composed of purple-blue, while Building *l* had approximately 29% purple-blue hues. However, there was a surprisingly high number of other colors of painted decoration on the sites as well. Building *l* had 71% of its painted pearlware assemblage in hues other than purple-blue. It appeared as if there might be more overall polychrome colors, which were used in decorations such as floral and geometric patterns that reached its popularity around the first decade of the nineteenth century. Based on Miller, Hunter, and Hume's observations, we speculated whether purple-blue is an indication of an earlier style while polychrome is a later style. We also wondered whether consumer choice dictated a preference towards purple-blue painted vessels at one site over the other.

Finally, we looked at Building *o* versus *l* using time constraints. We used phase 4 and phase 5 because these were the only two phases in which occupation on the two sites was concurrent. [Slide #19 Graph of Phase 4] For Building *l*, the only colors present during phase 4 were black, purple-blue, and yellow-red hues. [Slide #20 Graph of Phase 5] But the relative frequency of the purple-blue hues in Building *l* dropped slightly between phase 4 and phase 5. More interestingly, the frequency of polychrome color increases dramatically from 13% during phase 4 to 67% during phase 5, coincidentally reflecting the rise of pearlware on historic sites.

At Building *o*, purple-blue had the highest frequency during phase 4 at 39%. [Slide #19Graph of Phase 4] The polychrome colors at Building *o* showed a relatively uniform distribution, hovering between 5-10% for phase 4. [Slide #20 Graph of Phase 5] Phase 5 showed a slight dip in the frequency of polychrome colors. With the exception

of a very small increase in the frequency of purple-blue for Building *o*, the frequency of color and color variation did not change from phase 4 to 5.

Though we do not know how many ceramics were handed down directly from the main house, it is still interesting to see such a wide array of colors on pearlware coming from both of these slave sites. In Building *o* the amount of pearlware and the colors used were consistent through the phases, perhaps reinforcing the fact that it remained a domestic dwelling through the site's occupation or that the purchasing power of those that lived in the building did not change through time. The multiple roles of Building *l* perhaps attributes to the significant variation in color frequency through time. With such a significant shift in color from one phase to the next, it may be an indication of consumer choice and availability. The change from phase to phase might also indicate a change of occupation activity, from working space to a combination of domestic and industrial areas. The reevaluation of Building *l* by the Monticello's Archaeology Department indicates that industrial activity continued even after a domestic component was added.

A change of occupants may also be a likely reason for the sudden increase in ceramics. For example, young boys working and living in Building *l* would not have needed the extensive tableware a family would have. Similarly, purchasing power may have increased over time with the shifting of the building's role and its occupants.

[Slide #21 – Pearlware Chinese House] Nevertheless, the predominant color from both buildings is Intense Dark Purple-Blue. Interestingly enough, the most common hand-painted pearlware decoration of the eighteenth century was the Chinese house decoration. Though stylistic elements used on hand-painted pearlware was outside the

scope of our study, it is interesting to note that purple-blue is the principal component of the chinoiserie genre. We are interested in expanding our research to see whether color in conjunction with vessel form can determine a site's occupants. Does form change between the two phases and buildings in conjunction to color? Are there specific differences in stylistic elements that can be identified between these two sites to further identify who the sites' occupants were and what they did on a daily basis?

With the standardization of colors with the DAACS-MCRS, we were able to analyze glaze color and applied decorative color with less subjectivity. Further research could not only expand the sample sizes used in this paper, but study issues of color in terms of stylistic elements and form. Even though we just looked at color in terms of ceramics, the DAACS-MCRS can be used to determine color for artifacts as diverse as buttons and beads. Even though our work is preliminary and our data contained within the DAACS-MCRS is small due to the small number of sites cataloged to date, we are confident it will provide the groundwork for future research concerning color as a primary factor in questions about time, consumer choice, and purchasing power.

Reference:

Hume, Ivor Noel

1969 *A Guide to Artifacts of Colonial America*. Vintage Books, New York.