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Race, Class and Teeth: Dental Hygiene in the Market Street Chinatown

Introduction: The Chinese in San José

The creation of Chinatowns in California and across America was largely a self-protective act for the Chinese immigrants who lived in them. In the late nineteenth century, Chinese immigrants living in California were discriminated against not only socially but also in the eyes of the law, and subjected to violence on account of their race. By law, Chinese people were not allowed to testify in court, while "the murder of Chinamen was of almost daily occurrence" (Yu, 1991:11). Threatened by the idea that the Chinese immigrants would take their jobs, the white residents of San José mounted a campaign to expel the Chinese from their city (15). Facing of this level of racism and persecution, the Chinese immigrants established Chinatowns as cultural centers for their communities and safe havens from the world outside.

The Market Street Chinatown was the first of four Chinatowns in San José, with its downtown portion located at Market Street and San Fernando Street. In 1870, a fire burned down a large portion of the buildings, and the Chinatown was relocated to Vine Street (21). By 1872, much of it had been rebuilt (in brick), and people began to live at Market Street again (22). At its peak of population, the Market Street Chinatown housed over 1,400 people, and was home to dozens of businesses including general stores, grocers, and barbers (Laffey, 1994:18-19). On May 4, 1887, the Market Street Chinatown was burned by arsonists (Yu, 1991:29); and its displaced residents moved to two neighboring Chinatowns: the Woolen Mills Chinatown, populated by bachelor workers, and Heinlenville, a community that housed primarily families and merchants (Allen and Hylkema, 2002: 49, Yu 1991: 43).

In 1985 and 1986, the Archaeological Resource Service (ARS) conducted an excavation of the Market Street Chinatown at the request of The San Jose Redevelopment Agency; the land on which the Chinatown had been located one hundred years earlier was being cleared for the construction of the Fairmont Hotel and the Silicon Valley

Financial Center. After they were rapidly excavated during construction, the artifacts found on site were put in the care of History San Jose; they remained with History San Jose in their warehouse until 2002, when they were turned over to Professor Barbara Voss of Stanford University for cataloguing and analysis.

The Market Street collection is currently used in part as a teaching collection for Professor Voss' laboratory methods class; students in the class gain first hand experience by cataloguing and analyzing the materials from the Market Street collection. My paper is a product of work done in that class, focusing on the analysis of toothbrush finds in the Market Street Chinatown.

The first part of this paper contextualizes toothbrush finds in the Market Street Chinatown, and explains why I feel it is an interesting and important area to study. The second part will introduce the reader to the Market Street toothbrush assemblage, present the methods of my analysis, and discuss the results it yielded. I conclude with a discussion of future research questions that grew out of my work with the toothbrush assemblage.

Research Question and Aims: Why Toothbrushes?

One of the ways in which the racism toward the Chinese in California was expressed was through the systematic discrimination against Chinese immigrants because they were "unhygienic." In the late nineteenth century, the San Francisco Board of Health conducted several surveys of the San Francisco Chinatown in which the surveyor decried the state of the tenement housing in which the Chinese immigrants lived. By publishing these reports, which used sensational language to describe the living conditions of the Chinese, the Board of Health disseminated the idea among the white population of San Francisco and of California at large that the Chinese were unclean and their presence invited disease. According to these reports, and subsequently popular opinion, the fact that they lived in communities of bachelors and not in family units was testament to their dissolution; their implicit sexual promiscuity and other unclean living habits were concrete proof that the Chinese were bringing disease to the larger community of San Francisco (Shah, 2001).

In spite of what these reports would have people believe, the incidence of disease in Chinatown was no higher than in other parts of San Francisco (Shah, 2001). Although it is unlikely that housing conditions were quite as bad as the surveyors claimed, many Chinese in Chinatowns did live in tenements, at close quarters with one another. For me, this begs the question: did the Chinese in fact engage in better health practices than white Americans at the time that prevented disease?

I chose to study the toothbrush assemblage for two reasons. The first was that it contained a wealth of data, with over 80 toothbrushes in the collection. The second was that it is a subject that has not been well documented. Although toothbrushes are common finds at Chinese sites (see Lister, 1989, Shackel, 1993), no one to my knowledge has written about their use and design.

My research was driven by questions such as: who was using toothbrushes at Market Street? Was dental care something that only wealthier individuals had access to and partook of, or was a toothbrush a commodity that everyone had? Was there any sort of racial or class divide in dental care that was apparent from the distribution of toothbrush finds? In order to answer these questions, I drew on many historical sources about medicine in China and dentistry all around the world, in addition to the information I learned from the toothbrush assemblage itself.

Historical Background: Dentistry in China and America

Dental historians agree that the earliest practice of oral health care was in China several thousand years ago. Surviving manuscripts revealed that doctors in ancient China possessed an advanced knowledge of the diseases that affected the mouth. These manuscripts "describe practically every disease of the teeth and gums known today. Chinese physicians recommended several prescriptions for toothache, inflamed gums, and dental abscesses." (Bremner, 1939: 26). However, even though doctors in ancient China had identified the majority of periodontal diseases that we know today (not all, as the field of dentistry has made progress since 1939), the causes they identified were not quite on target. Cavities and gum disease were thought to have been caused by imbalances in yin and yang, sexual excess, and little worms with black heads that implanted themselves in the teeth, causing decay (ibid.).

Through the nineteenth century, the main way dental ailments were treated in China was through acupuncture; this was intended to restore the balance of energy in the body, treating all ailments, including problems with the teeth. According to traditional Chinese medicine practices, the most important component of medicine was preventing illness in the first place (Hillier and Jewell, 1983:150, Guerini, 1909:38). As part of this philosophy, "personal hygiene was accorded great importance amongst the gentry," including "frequent bathing and hair washing," though no explicit mention of cleaning the mouth is made (Hillier and Jewell, 1983:150). Toothpicks were in wide use all over the world for thousands of years, but the Chinese are credited with creating the first toothbrush in 1498, or rather, the first of what we would recognize as a toothbrush, with bristles perpendicular to the handle (Weinberger, 1948:43). These toothbrushes, and those that copied their design, featured tufts of boar bristles glued into holes that had been drilled along a piece of bone; the boar bristles used in toothbrushes all over the world were exported from China until World War II, when a road blockade prevented their export and manufacturers began to use the new material nylon instead (Sembera, 2006).

By the eighteenth century, Europe was catching up with China in terms of toothbrush technology. In 1780, an Englishman named William Addis created a toothbrush, presumably independent of the Chinese version, that is considered the first modern European toothbrush (Corrigan, 2005). At the turn of the nineteenth century, the toothbrush was becoming more and more popular in Europe among the upper classes. In America at that time, "dentistry… of recognized worth was an extension of French and English methods by trained dentists who transplanted to America the art of practice as it then existed in France and England" (Robinson, 1940:15). Indeed, there was very little of recognized worth about dentistry at that time. Dentistry was mostly practiced on a local scale by barbers who performed extractions and did little else. Teeth were viewed as being external to the humours and the health of the rest of the body, so extraction and dental care was a mechanical process that could be carried out with little training. In 1871, newspaper advertisements for dentists in San Francisco promoted only extractions and the fitting of false teeth, and not toothbrushing and other oral care (San Francisco Chronicle, 1871). At that time, brushing the teeth was "perceived as a mere matter of discipline and convenience intended to enhance the natural elegance of distinguished

people," and was not a widespread practice (Gaitán Amman, 2005:84). The American Dental Association was not founded until 1859, and it took several more decades to bring dentistry to its full legitimacy as a sector of medicine (Robinson, 1940).

At the same time, health care in China was very bad among the poorer classes. As the nineteenth century wore on, "frequent wars, local banditry, floods, and famine" contributed to the deterioration of the Chinese standard of living (Hillier and Jewell, 1983:14). Scores of people lived in very poor conditions, where they would intentionally mutilate themselves in order to attract sympathy when they lived as beggars (ibid.). These people had larger worries than their teeth.

It was not until at several decades after the arson at the Market Street Chinatown that tooth brushing was promoted in America on a large scale. In the mid-1930s, dentists began a campaign that claimed "A Clean Tooth Never Decays" (Bremner, 1939:189), but tooth brushing would not catch on for a few more years. The invention of nylon in 1938 helped along the process, because toothbrushes could be made with softer bristles that were not as prone to housing bacteria as boar hair was (Sembera, 2006).

Overall, it seems that the reason there is little literature devoted to the tooth brushing practices of the late nineteenth century is because it was not done very much. All over the world, dentistry took a backseat to other specialties as medicine developed, and tooth brushing was rare. Because it was so rare, the presence of toothbrushes and their distribution should prove very telling if there was a significant concentration of them in any one area.

The Market Street Collection:

The central aims of this study were to determine whether or not there was a relationship between socioeconomic status and toothbrush use within the Chinatown, and whether or not toothbrush use was more or less prevalent among Chinese Americans than other Americans. In order to investigate these questions, it was necessary to analyze the distribution and characteristics of the entire toothbrush assemblage. Out of approximately 90 entries from the ARS catalogues, I could not find seven, and six which were labeled as brush parts were not toothbrushes. Within those remaining 77 entries were some brushes that were found in several pieces which I joined together again, as well as one bag that

contained a group of 11 toothbrush heads that were assigned a single catalog number. In total, after putting together brushes that fit and counting the heads in the bag separately, there were approximately 85 individual toothbrushes in the collection.

Toothbrush Design and Morphology

The majority of the toothbrushes in the Market Street collection can be grouped into 3 morphological categories, all of which share certain key traits. They are all made of bone, they are all roughly the same length (about 14 cm, with 8 cm for the handle and 6 cm for the head), and weigh about 13-15 grams when whole. All toothbrushes from these three types have slits at the back of the heads to facilitate the changing of the bristles. Boar hair bristles were tied into tufts and inserted through the slits in the back, out the holes in front, then glued into place. This way, if the bristles wore out, they could be changed without discarding the whole toothbrush. All of the toothbrushes also have a hole punched at the end of the handle, presumably for a string to pass through them so they could be hung up, either so they could dry or for ease of carrying. None of the brush heads in these types are tapered, and they are all rounded at the end.

Type 1 is what the ARS catalog calls the “Chinese 3 circle design” (86-36 Catalog, Features 6A-24: 27). The handle is flat at the back, while the front has a slight convex curvature before it meets the head, which is flat on both sides (See Fig. 1). Viewed from above, the handle is narrowest at its pointed bottom, widening in an elliptical shape to reach its thickest point halfway along the handle, then narrowing again toward the neck. Along the neck are three bull’s-eye marks in a line. Two individuals, 8636-28-11 (pictured in Fig. 1) and 8531-18-232, showed traces of red paint in the three circles. In China, red is the color of success and good luck, so red circles may have been painted both for decoration and to entice people to buy and use the brushes. It is these circles and the patterning of bristles on the head that distinguish Type 1 from the other toothbrush types. The bristles are, without exception, clustered as tightly as possible around the perimeter of the head, with five holes at the bottom end, and three along the rounded end. The remaining space in the middle is filled with three staggered lines of holes. This allows more clusters of bristles to fit on the brush head, because they do not all tuft out at the same points, leaving gaps in the brush.

Type 2 is flat both front and back, with a handle that tapers only slightly until it reaches the neck. The handle is slightly longer and heavier than the Type 1 handle, and the neck is nipped in from both sides, usually in a semicircular curve, but not always. There is no marking on the handle, and the brush head has three even rows of holes, though how even they are varies with how well the brush is made. For example, artifact 8636-19-14, pictured in Figure 2, has three mostly even rows, but because the scale of the brush is so small, it is difficult to do it perfectly by hand. The description of its three-rowed head matches the description of the heads on the first American toothbrushes, patended by Dr. Meyer L. Rhein (Corrigan, 2005). While this is not conclusive evidence that they are the "American style," its design is a departure from the Chinese style, and could give us an insight as to who was using what distinct type of toothbrush.

Type 3 has physical characteristics that are a blend of the Chinese and American designs. The Type 3 handle has the same design as the handle from Type 2, yet one specimen, 8636-18-332, has a single circle at the base of its head. The Type 3 head has two staggered rows rather than three, but is otherwise identical to the Type 1 head.

Determining usewear on toothbrushes where the bristles have all deteriorated is difficult but not impossible; one of the ways to do so is to look at the patterns of breakage on the brushes. The physical proportions of the toothbrushes, with long heads and short handles, meant that their use put them under different kinds of strain than we are used to with modern toothbrushes. Most of the shear stress on the brush, from the downward pressure of the hand on the handle and the upward normal force from the teeth on the head, centers at the neck and the base of the head (Sembera, 2006). The neck is thick enough on the brushes to withstand the pressure from all but the most brutal of tooth brushings, but a large proportion of the breakages occur just above the neck at the lowest bristle holes, where the brush thins. It is far easier to snap there, because the cross-sectional area of the brush is a lot smaller and cannot bear the stress. These types of breakages suggest use more so than breakages that occur in the middle of the handle. In addition, two specimens showed signs of chewing, although it could have been a dog or other animal that chewed them, and it could have happened after they were discarded.

Research Methods:

A spatial analysis of the distribution of toothbrush finds was necessary to determine whether or not toothbrush use could be correlated with socioeconomic status. Using the ARS excavation map overlaid on the Sanborn insurance map of the Chinatown from 1884, I plotted the toothbrush data in two ways. First, I created a map that shows the number of toothbrush finds by type, with one colored dot per toothbrush find. Second, I created a density map that illustrates the relationship between number of toothbrush finds in a feature and number of total finds. For example, there was a large number of toothbrushes in Feature 5 of 86-36, but Feature 5 also had over 1700 artifacts. In contrast, 86-36 Feature 18 also had a large number of toothbrushes but far fewer finds. Toothbrushes constituted fully 3.5% of the finds for that feature.

As I sorted through the collection, I tracked the attributes of all the toothbrushes in a spreadsheet: for every artifact, I recorded its type and where breakages occurred on the brush if it was a fragment. I checked their lengths and weights, and made note of the quality of their manufacture and anything particularly unusual about them. I judged quality of make based on evenness of bristle holes, skill of carving, symmetry, and so forth. Once I had a map of the clustering of toothbrushes, I looked for common traits among each cluster, and looked up the buildings that had been near those features to see if any patterns emerged in the distribution of the brushes.

Results and Conclusions:

Figures 4 and 5 show the results of my two maps of the distribution of the toothbrush assemblage. For the first map, I assigned each toothbrush type a color: Type 1 (Chinese 3 circles) was given red; Type 2 (American straight-rowed) was blue; Type 3 was green, and all finds that were either too small to categorize or did not fit any of the types were coded yellow. To make the density map, which served to put the finds scatterplot in context, I took the number of toothbrush finds in a feature and divided that number by the number of total finds. I then scaled the colors on the map from pure red to pure yellow proportional to their rank in the scale from most dense to least dense.

Even a cursory glance at the maps in Figures 3 and 4 shows some fairly clear clustering in the toothbrush assemblage: there are almost no finds in the southeastern

quarter of the Chinatown, and most of the finds are centered in Block 6, the border between Blocks 3 and 4, and Feature 8636-18, located on the border between Blocks 2 and 9. According to Laffey, the area covered by Block 6 and Block 3 was a commercial zone; it housed several businesses, most interestingly four barbershops (1993:18). The block containing Feature 8636-18, which showed the densest clustering of toothbrushes, was also filled with stores.

Possible explanations for this clustering in commercial zones include that the toothbrushes belonged to merchants, the wealthier residents of Chinatown, probably living above or adjacent to their stores. The historical documents I consulted in my research all seem to suggest that there is a positive correlation between wealth and use of toothbrushes, although it was not the norm even among the wealthy. It is also possible that those people living in the area close to the barber shop (where it was likely that tooth extractions were performed, since barbers were often dentists) had toothbrushes more readily available to them, and so were more likely to buy them.

Outside the central cluster, very few toothbrushes were found. Only one toothbrush was found in each of 85-31 Features 3 and 24. Feature 3's brush was of inferior quality; Feature 24's was one of the miscellaneous brushes that fit none of my three types. However, this is not necessarily indicative of a relationship between distance from the commercial zone and poor quality of brushes, because within almost every feature with a larger sample size there was a great deal of variation in the quality of the toothbrushes.

Feature 18 yielded the most interesting results of any feature. It had the highest proportion of toothbrush finds to total finds, and the variation in toothbrush type was greatest. It was where the unusual Type 3 brush with the single circle was found, and it had the highest proportion of brushes (.5) that had broken at the joint of neck and bristle holes, possibly indicating use. Whoever was using the trash pit seemed to use more toothbrushes than average. However, this could be attributable not only to more widespread use of the toothbrush, but also to more cavalier use of the toothbrush. People could have been throwing toothbrushes away not just because they broke, but because they were considered disposable to some degree. For example, at this time in India it was customary to throw away your chewing stick every day as a matter of cleanliness.

According to historian Leo Kanner, “the modern Hindus clean their teeth with a fresh twig every day, and are horrified that Europeans do it with a brush made of the hair of an animal, and do it frequently with the same brush” (1928:79). By contrast, people in other places may not have been throwing their brushes away at all, even after they had snapped in two. Both scenarios negatively affect the accuracy of using the number of brush finds as a measure of the popularity of the practice of brushing.

Although my results do seem to indicate a correlation between wealth and toothbrush use, I hesitate to draw any explicit conclusions about this relationship. There were few features excavated near the tenement area of the Chinatown, and with such a large chunk of data missing from the collection, it would be irresponsible to claim based on Features 85-31 23 and 24 alone that there was little tooth brushing among the poorer inhabitants of Chinatown.

Questions for Further Research

Due to the paucity of information on large swathes of the Chinatown and on toothbrushes in general, there were many issues that I would have liked to explore that were simply beyond my reach. For example, there were almost no incidences of American style toothbrushes in all of 85-31, yet in the 86-36 area, there were several. I would have been interested to know whether there was a preference for one kind over the other, and whether one was more expensive. Alternatively, perhaps the barbers or merchants inside Chinatown supplied a particular brand of toothbrush to the residents in their immediate vicinity, but the people living at the edges of the Chinatown (Feature 8636-18) had access to a wider range of designs, sold outside Market Street. While all this conjecturing would be interesting if it were true, it can only be conjecture until more research is done on this subject.

It would be interesting to explore further the relationship between socioeconomic class among Chinese immigrants and their level of assimilation to American culture. Were wealthier people buying more American toothbrushes, or fewer? Was it significant what sort of toothbrush a person bought, or was a toothbrush a toothbrush, no matter who made it? Based on how little information there is on toothbrushes and tooth brushing, it is entirely possible that people did not worry themselves very much about how nice their

brushes were. Even today, for every person who invests in an electric Supertoothbrush, there are plenty of people who buy the cheapest disposable brushes, because they serve a utilitarian purpose.

However, what I would be most interested in learning about is the question of the spread of disease in urban settings. Is better oral health a factor at all in limiting the rate of infection among people living closely together? Or is it exclusively attributable to good plumbing and waste disposal? The study of public health is a subject that deserves attention not only looking backward, but for the future and protecting people from disease in the present. I hope this paper may be of use to anyone who engages the subject in future.

Figure 1: (above) The Type 1 Toothbrush (Chinese)
Figure 2 (below) The Type 2 Toothbrush (Euro-American)

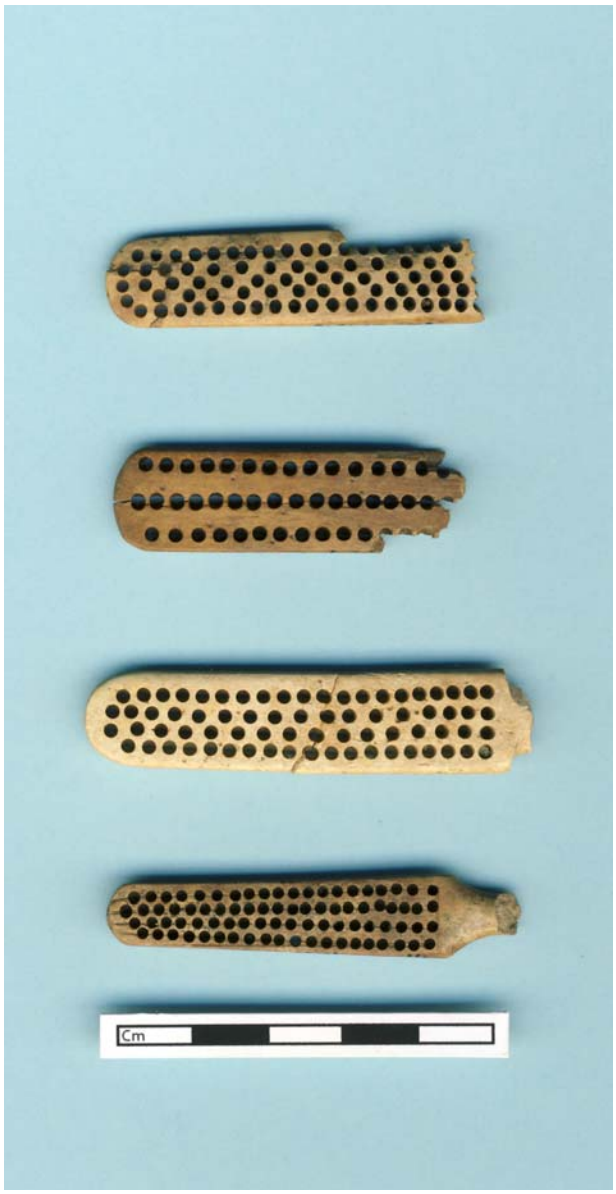

Figure 3: Toothbrush heads, top to bottom: Type 1, Type 2, Type 3, and an artifact that did not fit into any of the three groups.

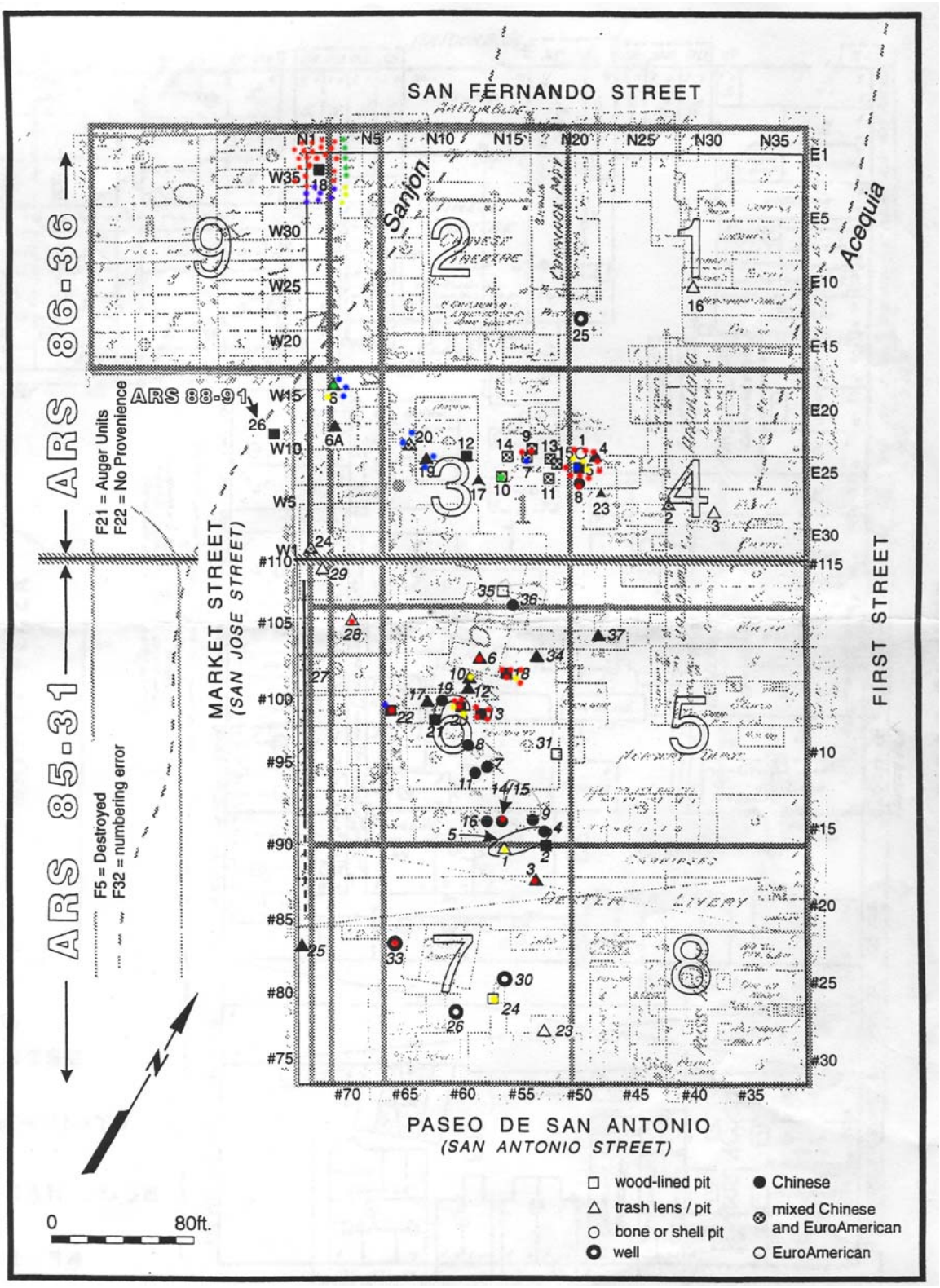

Figure 4: Toothbrush Distribution by Type. 1= Red; 2= Blue, 3=Green, Unidentified= Yellow

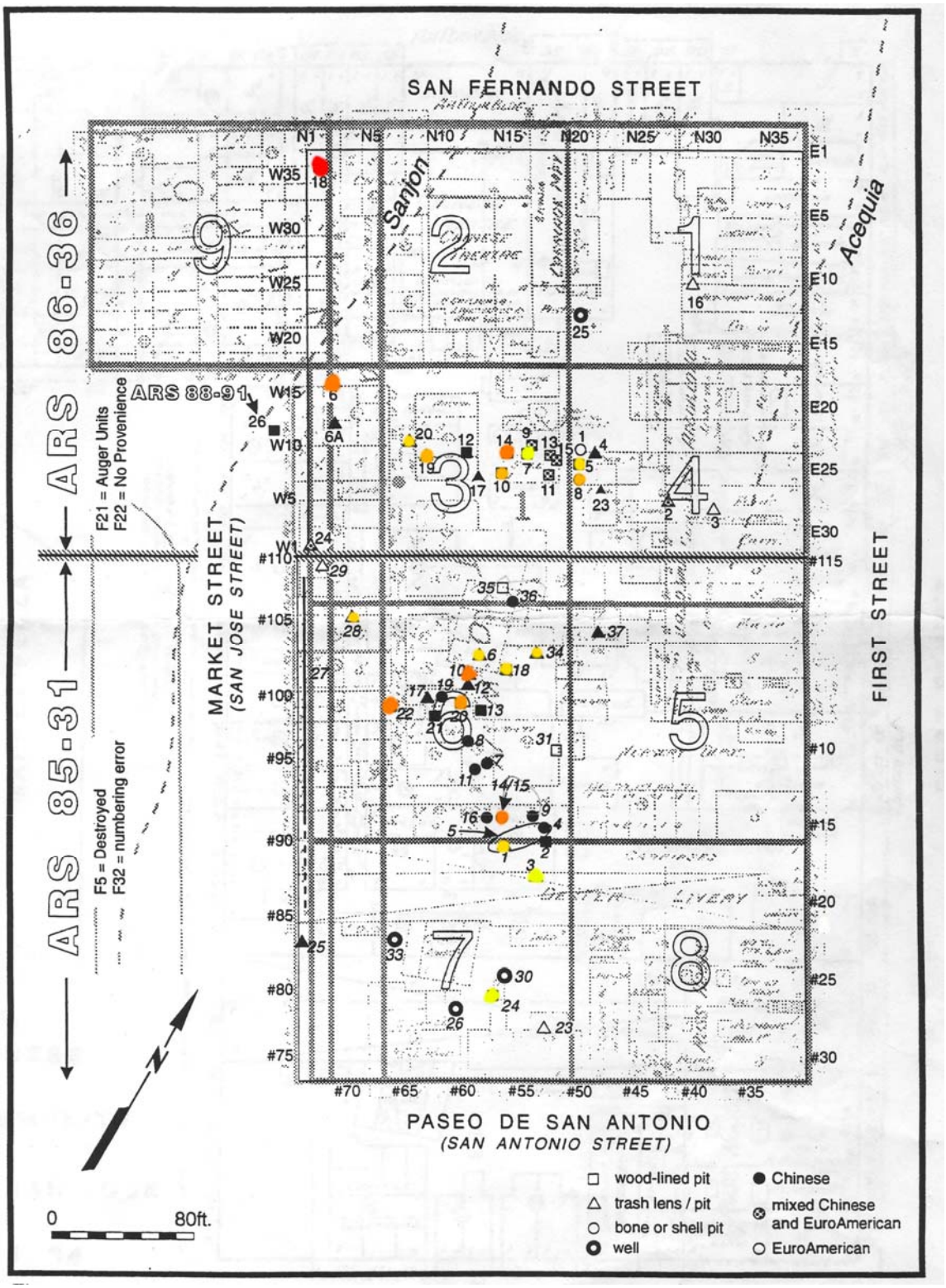

Figure 5: Toothbrushes by Density; Red → Yellow, Most Dense → Least Dense

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