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False Starts and Score Marks: New Tools for Historic Butchery Analysis

Andrea Zlotucha Kozub

Faunal assemblages from 19th-century urban sites generally consist of retail meat cuts acquired from butcher shops. Bones that have been butchered with regularity, precision, and occasionally, a type of knife mark introduced here as a “score mark”, indicate that the meat was butchered professionally. Additional butchering was often performed at home by housewives or female servants using cookbook direction for guidance. Their activities may be recorded on bones in the form of irregular cut, chop, and/or saw marks that reflect inexperience, poor tool selection, and even frustration. The collective marks of both professional and amateur butchers are “signatures” that may be interpreted to enhance faunal analyses and site interpretations.

Les assemblages fauniques des sites urbains du 19e siècle sont généralement composés de coupes de viande achetées à la boucherie. Les os découpés avec régularité, précision et ayant occasionnellement un type de trace de couteau nommé « marquage » indiquent que la viande a été coupée professionnellement. De plus, les femmes au foyer ou les servantes effectuaient souvent de la boucherie à domicile, en suivant les instructions de livres de recettes. Leurs activités peuvent être décelées sur des os sous forme de coupes irrégulières, de marques de couperet et / ou de marques de scie qui reflètent le manque d’expérience, une utilisation inadéquate d’outils et même une frustration. Les marques collectives des bouchers professionnels et amateurs sont des signatures qui peuvent être interprétées pour améliorer les analyses zooarchéologiques et les interprétations des sites.

Introduction

Historical zooarchaeology has undergone a shift in recent years as research emphases have moved from identifying what people ate to how people ate. Research on the social context of food—from acquisition to preparation to consumption to disposal—has been enhanced by analysts incorporating a variety of artifact classes and contextual resources into their interpretations of faunal and botanical remains. By using cookbooks, vessel analysis, and other types of complementary data, researchers can develop more holistic, anthropological views of historical foodways. Butchery marks may be overlooked as the expected, even routine, evidence of food preparation. In some instances, however, the information that may be gleaned from butchery marks is anything but routine and may add nuance or alternative interpretations to foodways research. The following discussion is a preliminary exploration of new methodological approaches to butchery-mark analysis that may enhance the research potential of faunal assemblages within the context of diversified foodways interpretations.

The act of butchering meat for urban household consumption evolved over the course of the 18th and 19th centuries from an idiosyncratic, home-based procedure to a standardized, market-based business. This evolution is made archaeologically visible by the increased prevalence in faunal assemblages of neatly sawed bones representing the uniform meat cuts of retail butchering establishments. These regular portions of beef, pork, and mutton are a component of the “urban subsistence pattern” (Henry 1987), in which the ever-increasing diversity of prepared food items contrasts with a dependence on standardized cuts of domestic meats acquired from a butcher shop. The resultant faunal assemblages are relatively homogenous from site to site within a neighborhood (Pipes and Janowitz 2013) and possibly from city to city (Henry 1987: 27). Archaeologists looking for diversity within meat-cut assemblages typically focus on the relative proportions of the three domestic meats and the relative proportions of cut types for each. These data have been used to interpret status, ethnicity, economics, and site function, although with mixed

results (Bowen 1992; Cheek and Friedlander 1990; Henry 1987; Huelsbeck 1991; Landon 1996; Lyman 1977, 1987; Milne and Crabtree 2001; Mudar 1978; Reitz, Ruff, and Zierden 2006; Rothschild and Balkwill 1993; Schultz and Gust 1983).

Butchery marks are a ubiquitous, but relatively unstudied, variable in urban assemblages. These marks are the inadvertent signatures of butchers and, as such, may be used to identify their makers. I argue that certain characteristic marks signal the professionalism expected of tradesmen engaged in a highly standardized business while other marks signal the activity of inexperienced or ill-equipped cooks engaged in occasional home butchery. These distinctions are likely gendered in most instances. Professional butchery was a masculine trade in the late 19th century; women entered the workforce to perform peripheral, unskilled tasks in the early 20th century (Horowitz 1997b). That the “women’s work” of domestic food preparation might also involve butchery is an idea that has been largely overlooked by historical zooarchaeologists (Landon 2005).

Butchery Nomenclature

Butchering is a process that involves three basic steps: (1) primary butchering, which includes slaughter, dressing, and skinning; (2) secondary butchering, which is the division of the carcass into large portions (wholesale cuts); and (3) tertiary butchering, which includes division into smaller portions (meat cuts) and/or the processing occurring during cooking and consumption (Landon 1996). Tertiary butchering is usually presumed to have occurred in a professional environment (i.e., the slaughterhouse or the butcher shop), though, as shall be seen, tertiary butchering was also performed in consumers’ kitchens. Studies of historical tertiary-butcher practices typically focus on the development of identifiable meat cuts (Landon 1996; Schweitzer 2010), whereas here I focus on the byproduct of tertiary butchering—the marks

themselves. This article offers criteria for distinguishing the signature marks of professional (shop) butchers from amateur (kitchen) butchers and suggests how this information may contribute to foodways-related research on topics such as consumer interactions with the marketplace, aesthetics and presentation, home economics, recipe and cookbook use, and the gendered division of labor.

The marks presented in this article were recognized during the analyses of several large urban assemblages excavated in central and western New York State by the Public Archaeology Facility (PAF). These include a 2013 reanalysis of faunal material from the Rainbow Plaza sites in Niagara Falls (Hohman 1994; Wurst 1997) and analyses conducted for several sites in downtown Binghamton (O’Donovan 2010, 2011, 2012, 2014). All of these materials were recovered from domestic shaft features with the exception of bones from a hotel privy in Niagara Falls. The marks can be divided into three basic types: saw marks, which are readily identifiable by characteristic striations on the cut face or a squared groove for incomplete cuts; cut marks, which are thin incisions caused by the slicing action of a knife blade; and chop marks, which may be wedge-shaped scars caused by light blows and/or lightweight tools (e.g., a cleaver) or severed bones with smoothly faceted breaks caused by heavier blows and/or heavy blades (e.g., a hatchet). The latter type of chop mark was designated a “shear” in Landon (1996). The marks of these three types of tools may be found individually or in combination, and the patterns they make may allow the interpretation of the history of a bone as it passed from the retail butcher shop to the household butcher’s kitchen and on to the plate.

The Signatures of Retail Butchers

Urban tertiary butchering has been largely divorced from primary and secondary butchering since the colonial era, when cities, such as Boston (Bowen 1992; Landon 1996), began to prohibit the slaughter of animals within their

municipal limits. By the late 19th century, workers at rural or suburban slaughterhouses were responsible for creating wholesale cuts, which were then distributed to retail meat cutters operating in urban neighborhoods and marketplaces. Butchers working at all levels of production needed anatomical knowledge, a sufficient toolkit, and strength to wield their tools precisely and efficiently. Slaughterhouse butchers recognized that “one poor stroke [of the cleaver] ... could ruin many of the consumer cuts” (Horowitz 1997a: 19). The same was true for retail butchers engaged in tertiary butchering, as their livelihoods depended on satisfying their customers, thereby securing their patronage.

The butcher’s essential tools were the saw, the knife, and the cleaver. Though used alongside chopping tools as early as the 17th century (Landon 1996), saws were not widely or regularly used for butchering until the 19th century. James Deetz (1996: 171) saw this technological shift as driven by Georgian period emphasis on the individual and, by extension, individualized portions. In this respect, saws facilitated the production of single-meal or single-serving

steaks and chops. The ease with which these flat cuts could be prepared on cast-iron stovetops may have also contributed to their increased popularity during the 19th century (Schweitzer 2010: 420).

Despite its name, a meat saw is used by butchers to cut bone rather than flesh. The narrow blade and small teeth of this specialty tool are similar to those of a hacksaw in shape and in the ability to sever dense, hard material. Professional butchers likely preferred meat saws for producing clean, neat breaks and protecting valuable meat from the excess friction, shredding, and bone dust that would have been caused by a wider blade. Band saws were invented in the early 19th century for woodworking and were regularly used by retail butchers in the post-bellum Knoxville area (Windham 2003). This does not appear to have been true for late 19th-century urban assemblages in upstate New York where hand sawing seems to have been prevalent.

While saws are efficient tools for butchering bone, they are inefficient and injurious tools for cutting meat itself (Seetah 2006: 21). This job is better handled by a knife. Just as a surgeon uses

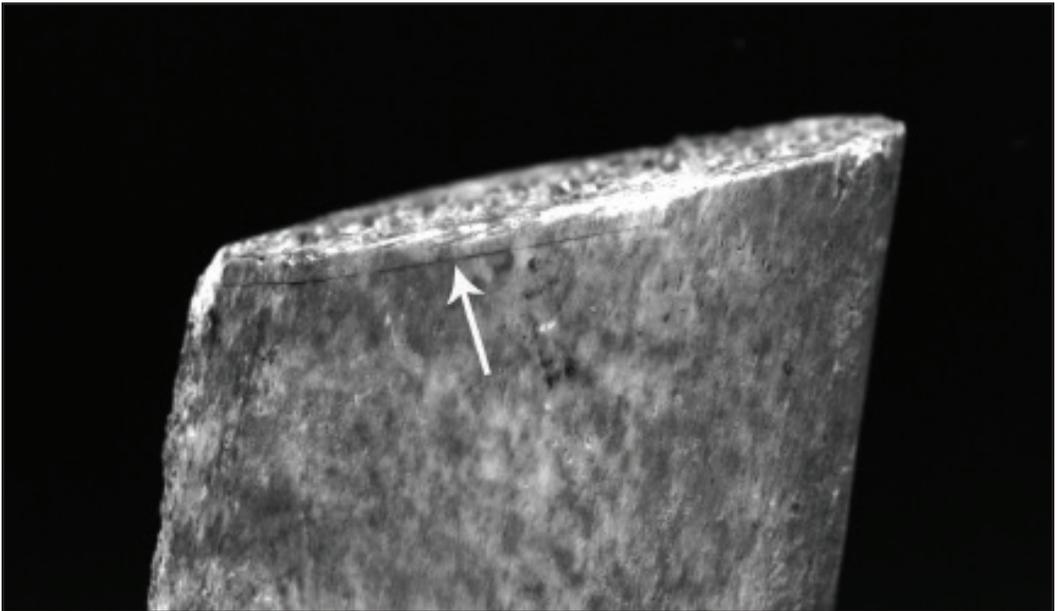


Figure 1. A score mark (indicated by arrow) along the sawed edge of a rib segment; photo taken under UV light to enhance mark visibility. (Photo by David Tuttle, 2017.)

a scalpel to part flesh carefully and expose bone during amputation, an experienced butcher uses a knife to slice cleanly through meat prior to sawing the underlying bone. This act minimizes damage to the salable product and provides a visual guide for the saw. Knives used in this manner may leave short, shallow cut marks in the surface of the bone. Subsequent sawing often, but not always, obliterates these ephemeral marks. Those that remain are visible as fine scratches lying directly parallel with the sawed surface (FIG. 1).

These cuts have been described as “score marks” in the PAF faunal lab and are most frequently observed on beef, particularly cross-sectioned (transverse cut) pieces of femur, scapula, pelvis, and rib. Score marks do not wrap around the perimeter of the sawed edge, which shows that the meat was butchered in a single direction as it rested on the block. After the bone was sawed, the butcher cut the meat remaining underneath with the knife. The interpretation of score marks is indirectly supported by an unusual 19th-century recipe for “Soyer’s New Mutton Chop,” in which meat is tenderized by the saw’s teeth during butchering: “Trim a middling-sized saddle [paired loins] of mutton, which cut into chops half an inch in thickness with a saw, *without at all making use of the knife* (the sawing them off jagg[ing] the meat and causing them to eat more tender). ... Do try them, and let me know your opinion [emphasis added]” (Ellet 1857: 299; Soyer 1850: 180). These instructions make it clear that knives were normally used with saws when segmenting meat into chops or steaks.

Score marks indicate precise and systematic butchery and may be interpreted as the signatures of professional butchers. Landon’s (1996) analysis of faunal remains from colonial Boston was supported by detailed diagrams showing the types, locations, and orientations of butchery marks on beef, pork, and mutton bones. While nascent retail portions are evident in some of the diagrams, they are not associated with closely parallel cut and saw marks. The absence of something like a score mark suggests that pre-19th-century saw use was not

typically paired with preparatory knife work. This two-step method was probably the norm by the early 19th century, since the technique of eliminating knife work was apparently a novelty in the 1850s, as suggested by the “Soyer’s New Mutton Chop” recipe. It is, therefore, expected that late 19th-century urban assemblages will include at least some retail cut specimens exhibiting score marks, as has been the case in Binghamton and Niagara Falls. It is not to be expected that all retail cuts will include these marks, as the butcher may have completely obliterated the scored line with his saw. Certain taphonomic forces may also obscure these marks, including cortical exfoliation of weathered bones and animal (particularly rodent) gnawing. Nonetheless, their presence may be used as confirmation of systematic—and, therefore, probably professional—butchering.

The relative thicknesses of steak and chop bones are retail butchery variables that may be easily measured and compared to 19th-century recipes. These bones are cross-cut segments of the femur, humerus, ilium, scapula, or vertebra, and may have been sold as round, rump, sirloin, chuck, or loin. Some cookbooks specified a desired thickness for steaks and chops, with pork and mutton cuts typically $\frac{1}{2}$ in. thick and beef steaks being slightly thicker at $\frac{1}{2}$ –1 in. thick (depending on cooking method). Sarah Hale was adamant in the *Ladies New Book of Cookery* that mutton chops be no thicker than $\frac{1}{2}$ in. (Hale 1852: 121, 123), while Eliza Leslie specified, in *Directions for Cookery* (Leslie 1840: 120), that $\frac{1}{2}$ in. pork steaks should be broiled longer than beef steaks cut to $\frac{3}{4}$ in. to ensure the former were completely cooked. Hale (1852: 88, 91) preferred her beef rump steaks to be $\frac{1}{2}$ – $\frac{3}{4}$ in. thick for broiling, but closer to 1 in. thick for stewing. These recommended thicknesses show variation across species, cut/anatomy, and cooking method and, of course, represent ideals that may be particular to the background of the cookbook authors. Deviations from these ideals in faunal assemblages may reflect economic decisions based on ethnicity, class, or other variables of interest to historical archaeologists.

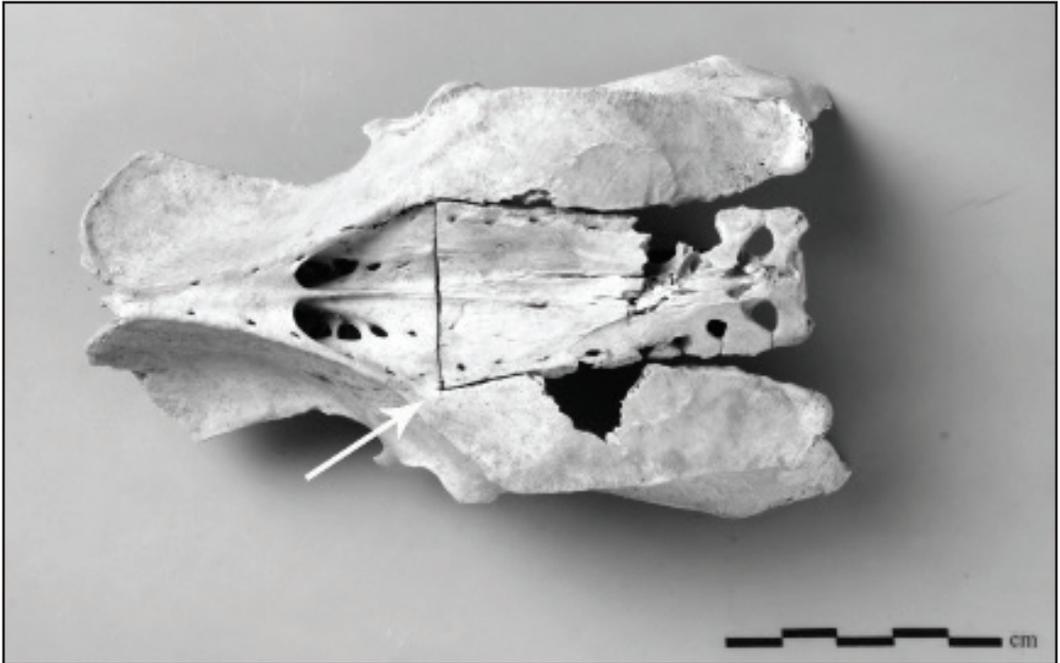


Figure 2. A turkey pelvis with a carefully butchered synsacrum. (Photo by David Tuttle, 2011.)

Customized orders from the butcher shop may leave a specific suite of marks on faunal remains and thereby introduce variety into an assemblage. A good example of this is depicted in Figure 2, which illustrates a butchered turkey pelvis found in a Binghamton privy (O'Donovan 2010). The butcher detached a portion of the synsacrum (fused backbone) using a knife wielded with surgical precision. The pelvis and the synsacrum fragment were recovered from the same 5 cm excavation level, suggesting that the detached piece remained in place during cooking, service, and disposal. This tricky bit of knife work required a skilled hand and was probably performed by a retail butcher fulfilling a special request to enlarge the stuffing cavity while retaining the general shape of the bird. It is interesting that so much care was taken in butchery that would have probably been concealed if the bird was served breast up.

This turkey may have been an example of engastration, an ancient method of stuffing smaller animals into the abdominal cavities of larger animals to produce a decadent meat cen-

terpiece. The concept was introduced to early 19th-century audiences by a French chef, Grimod de la Reynière, who nested 17 birds, one inside the other. An English translation of his recipe described cutting the head and feet off the smallest bird and deboning the remaining species (Reynolds 1849: 86). That the butchered turkey pelvis was merely enlarged indicates that any hypothetical engastration was conducted on a much more limited scale than Reynière's *rôti sans pareil* or even a modern "turducken." Nonetheless, turkeys were associated with holidays and feasts in the late 19th century, and this specially butchered bird suggests the preparation of a particularly special meal.

The Signatures of Household Butchers

While the butcher shop was the primary meat source for most urban families, the retail butcher was not necessarily the last person to leave his mark on the bone. By carefully observing the character, placement, and types

of butchering marks, archaeologists may be able to identify the home butcher and, possibly, her preparation methods.

One of the effects of urbanization is that cooks were largely divorced from the primary and secondary butchering that rural wives experienced when processing domestic and game animals. By the second half of the 19th century, a generation or more of urban women had lost knowledge about meat, including butchering techniques and the anatomical sources of particular cuts. Cookbooks became popular as women sought instruction in a variety of kitchen tasks. According to the superintendent of the New York School of Cookery, writing in 1885, the majority of books on the market “fail to meet the demands of housewives, because they are indefinite” (Corson 1885: vi). Directions for butchery were infrequent and typically vague. It is likely that cryptic cookbook prose frustrated women who, lacking guidance from a mentor, struggled to disarticulate joints or break hard bones with the tools on hand. Their experiments and frustrations may be literally etched into the bones in the form of imprecise, irregular, or erratic butchery marks. These marks may be recognized as the signatures of amateur butchers.

A perusal of 19th-century cookbooks shows that most recipes for beef, pork, and mutton focused on seasoning and cooking meat without any further butchering. The retail cut was considered sufficiently butchered for most recipes and cooking methods. Nonetheless, some recipes clearly show that women were expected to engage in occasional butchery or related tasks at home.

For example, some recipes called for deboning, which could result in a specific suite of cut marks (see Landon [1996: 76–77]). Published instructions for this task were highly variable, from simply: “[R]emove the bone from the thin part of the [beef] roast” (A Veteran Housekeeper 1886: 104) to the highly detailed:

To remove the bones, cut from the inside of the [lamb] shoulder, to take out the shoulder-blade, then cut the flesh away from the round bone,

turning it away like a glove from the hand, until that part of the bone just above the foot joint is reached; cut here from the inside, and trim the end projecting from the flesh to resemble the bill of a duck. (Corson 1885: 318–319)

The final instruction, to essentially whittle the end of the bone, was to enable a fancy presentation with the leg elevated and the joint bent to resemble a nesting duck.

Deboning was a task often relegated to the retail butcher, as indicated by this recipe for roast beef: “Make your butcher remove most of the bone, and skewer the meat into the shape of a round” (Harland 1873: 98). If this advice was followed, then the bones may have been discarded at the shop. If the meat was purchased bone-in and then deboned on request, the customer might elect to take the bone and trimmings home for use in soup or gravy preparation: “All the trimmings should be sent home with the boned ribs, to be used for soups or sauces” (Corson 1885: 313). Such canny advice was not found in the other books consulted for this research, which could suggest that it was either an uncommon practice to bring home scraps and bones or that Corson was merely articulating an unspoken norm. This ambiguity could undermine interpretations of deboned specimens in a domestic assemblage when associated butchering signatures are not also present.

Another type of home butchering suggested by cookbooks is the further segmentation of retail meat cuts. This was most common in soup or stew recipes, in which the cook was instructed to break, crack, or saw bones into pieces before immersing them in cooking liquid: “Break the [veal] shank, wash, and put into two quarts of water with an onion” (A Veteran Housekeeper 1886: 118). Shanks (or shins) were usually used for these recipes, sometimes in conjunction with a joint (or knuckle) to provide collagen for thickening. The implication of these instructions is that shanks were typically purchased wholesale and reduced to pot size at home. That this was a regular practice is suggested by Thomas De

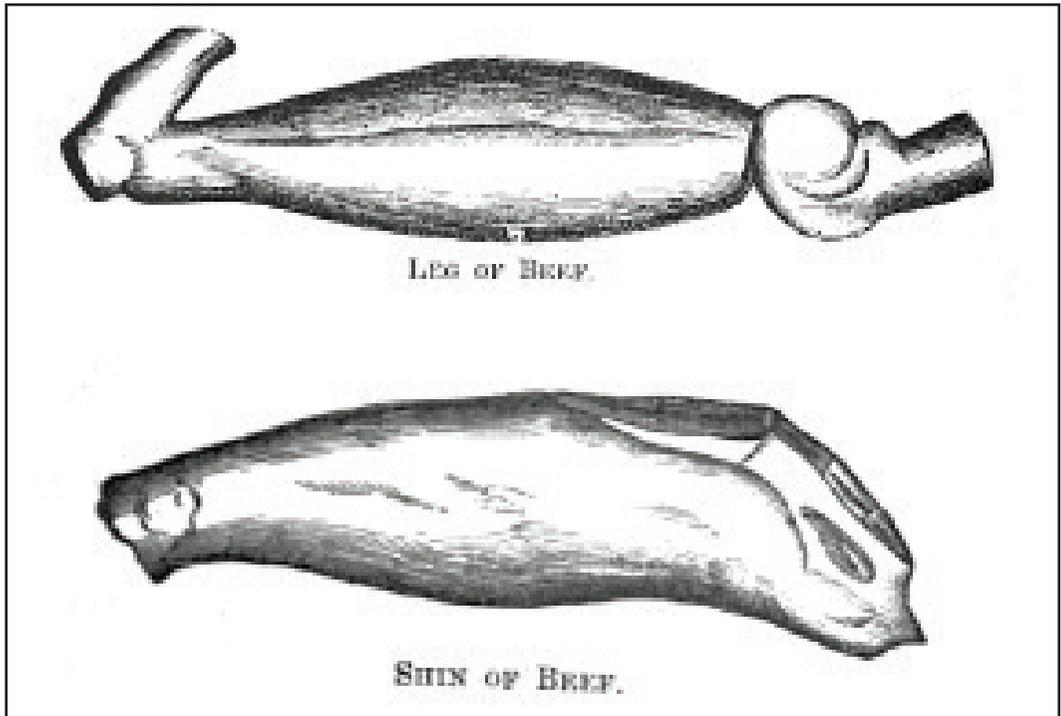


Figure 3. Retail meat cuts depicted in *The Market Assistant* (De Voe 1869). (Courtesy of Michigan State University Libraries, Gerald M. Kline Digital and Multimedia Center.)

Voe's (1867: 52, 57) illustrations of beef leg (hind shank) and shin (fore shank), which show that the entire lower limbs, including the "knuckle" bones, comprised these salable meat cuts (FIG. 3).

Heads could also be purchased wholesale and butchered at home. Some recipes specified the butcher's role in preliminary processing, while others clearly expected that the cook would be working with an intact head. Readers of *The Ladies New Book of Cookery* could find themselves processing a whole head one day and ordering the retail butcher to do the job the next:

Boiled Calf's Head—When the head is dressed with the skin on, which many persons prefer, the ear must be cut off quite close to it. ... In either case, first remove the brain. (Hale 1852: 110)

Lambs Head ... take care that the butcher chops [the head] well through, and cuts out all the nostril bones. (Hale 1852: 132)

The instructions for butchering bone-in meat were usually vague with respect to which tools to use, where and how to break bones, and portion size. Take, for example, another of Hale's (1852: 118) recipes: "Take a very small leg of mutton, cut off the knuckle, and trim it nicely ... then put it into a stewpan with the knuckle-bone broken." A reader can envision the essence of her instruction, which was to separate the joint prior to cooking both pieces in the same pan, but the location of the cut and the appropriate tools to use were unspecified. Leslie's recipe for "Cutlets à la Maintenon" was also unclear: "Cut a neck of mutton into steaks with a bone in each; trim them nicely, and scrape clean the end of the bone" (Leslie 1840: 109). These instructions are confusing, given that a "neck" was a variable term, though it is likely that she was referring to what modern cooks call "rack of lamb."

The harder labors of butchery were viewed by some authors as beyond the capabilities or

situations of their readers. For example, *Common Sense in the Household* made no reference to home saw use at all and dismissed the likelihood of a “lady-housekeeper” needing to use a hatchet or cleaver (Harland 1873: 132). Some authors who did not explicitly relegate this work to the retail butcher still implied that a person besides the cook was expected to wield the large tools: “Have the [shin] bone sawed in three or four pieces” (Sanderson 1864: 102). Contrast this with *Cookery and Housekeeping* (A Veteran Housekeeper 1886: 109), which instructed readers to “[t]ake a shin of beef, saw it into four pieces, put it in a pot, and boil until the meat and gristle drop from the bones.” These directions imply that all tasks, including the butchery, were to be per-

formed by the same person. Similarly, *The Practical Housekeeper* (Ellet 1857: 123) included both a “chopper” and a meat saw in a description of essential kitchen tools. The concept that women needed saws for home butchering was eventually recognized by manufacturers, who began selling “kitchen saws” (essentially scaled-down meat saws) in mail-order catalogues by the end of the century (Windham 2003: 47).

One of the difficulties that faced many urban household butchers was a poor understanding of animal anatomy. Visual aids were likely limited to butchery diagrams, and as Schweitzer (2010: 196) and other faunal analysts have found, translating these two-dimensional diagrams onto a three-dimensional meat cut is

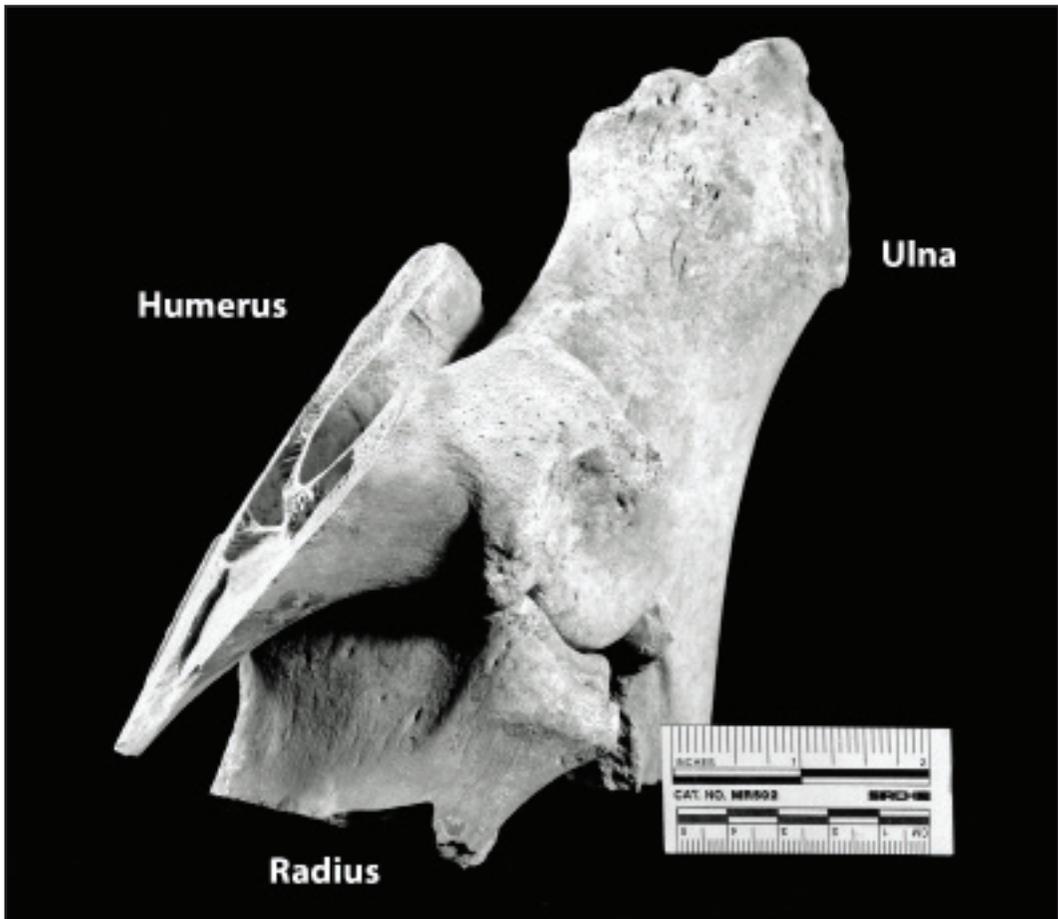


Figure 4. A home-butchered beef joint. (Photo by David Tuttle, 2014.)

problematic. Figure 4 illustrates the three bones of a beef elbow joint that were butchered atypically, using a coarse-bladed saw. The result yielded a “shin” with an ungainly projection of bone and an irregular scrap of “clod” (arm) meat. Comparison with the shin depicted in *The Market Assistant* (De Voe 1867: 57) shows that a professional would have sawed the elbow in the reverse direction, so that the severed end of the humerus made a continuous line with the projecting ulna. Cut-mark diagrams for archaeological bone given by Lyman (1977: 68) and Azzizi et al. (1996) show oblique joint cuts consistent with De Voe’s illustration, as well as other options for dividing the shin that avoided the elbow joint altogether. The bones depicted in Figure 4 show the butcher’s awkward attempt to navigate the bony elbow and find the easiest way to saw through the joint. In the end, her poor understanding of anatomy likely increased the difficulty she experienced.

The bones in Figure 4 exhibit a second type of home butchery signature, though one not clearly visible in the photograph. The shafts of the ulna and radius were partially sawed and then snapped, leaving ragged edges on one side. The shortcut approach of sawing and breaking (or chopping through the saw’s channel) is suggestive of butcher fatigue, particularly when attempting to saw through very large, dense bones such as these. Retail butchers would have been unlikely to use this trick, as breaking a bone afforded less control than sawing and often left bony spurs or projections as unattractive nuisances for customers. Spurs could also get in the way of the butcher attempting to use his knife to cut through the remaining meat. The quality of the saw marks and their position on the bones indicate that the joint seen in Figure 4 originated as a much larger cut that was processed at home by an inexperienced butcher.



Figure 5. Home-butchered bones, clockwise from top: (a) a large mammal rib with a scored and sawed end at right and incompletely chopped neck at left; (b) a large mammal rib with false-start saw marks overlapping chop marks; (c) a tibia with multiple chop marks; and (d) a sheep radius with random chop marks. (Photo by David Tuttle, 2014.)



Figure 6. Bones with chop marks, clockwise from top: (a) a large mammal rib with chop marks and false-start saw marks at right; (b) a pig pelvis with multiple chop marks; and (c) a large mammal rib neatly sawed on right and chopped on left. (Photo by David Tuttle, 2014.)

Some butchery marks betray the inadequacy of a cook's tools and/or her insufficient strength or stamina to wield the tools effectively. For example, a household butcher dissatisfied with the progress of her task might try a different approach or tool. Strategic changes are easily identified when chop and saw marks are observed in the same location or general orientation on a bone. These marks may overlap if a tool was simply exchanged mid-cut, such as when a chopping tool is swapped for a saw (FIG. 5*b*). This is procedurally different from the "scoring & sawing" suite of cuts described earlier, in which two implements were used to perform complementary, rather than similar, tasks. The chop and saw marks on the bone in Figure 6*a* illustrate what it could look like when a butcher is frustrated with both tool and cut location.

The archaeological evidence of chopping tools, whether hatchets or heavy knives/cleavers, indicates that these were particularly

challenging tools for home butchers to wield effectively. The difficulties with using these types of tools probably arose from insufficiently heavy blades, inadequate arm strength or leverage, or poor choice of cut location. One or more of these conditions usually resulted in a bone exhibiting multiple chop marks distributed in clusters or randomly scattered across the surface (FIGS. 5*a*, *c*, *d*, 6*b*).

While saws are usually more efficient than chopping tools, a common pattern of marks indicates that some household butchers found them difficult to use. This pattern is characterized by one or more grooves lying parallel and usually closely adjacent to the sawed face of butchered bone. These grooves are incomplete saw marks caused by stopping, adjusting the location of the blade, and starting over again (FIGS. 5*b*, 6*a*). These marks are described in the PAF laboratory as "false starts" and are interpreted as evidence of both butcher fatigue and informality. A retail butcher who sawed bones

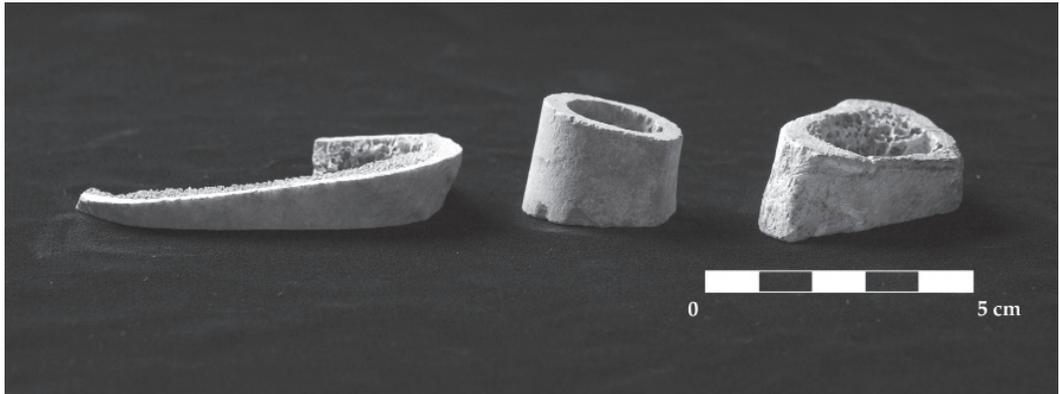


Figure 7. Unevenly sawed steak bones. (Photo by David Tuttle, 2017.)

every day would have been likely to complete the task in one continuous motion. If he needed to pause during the cut it is unlikely that he would have started over in a new location. This would be a waste of his professional time and his product would have a ragged appearance unattractive to customers. An amateur butcher unused to the particular labor of sawing heavy bones might need a rest, and a busy housewife or servant could be interrupted by any number of household distractions. Choosing to disregard the existing groove(s) to start afresh signals a lackadaisical approach more understandable in one's own home than behind the counter of a retail shop. It is also possible that ragged sawing (or chopping) may not matter for certain recipes, leaving the cook the latitude to butcher with less care than she might for recipes in which presentation played a greater role.

It should be expected that, since most (if not all) urban meat was acquired from a butcher and some of these cuts were further modified at home, some specimens in a faunal assemblage will bear the marks of both retail and home butchers. This may be seen when the opposite ends of a bone segment exhibit inconsistent butchery practices. For example, one end of a bone might be scored and sawed with the regularity and precision characteristic of a retail butcher, while the other end has been hacked unevenly by a person with an inadequate tool, experience, or strength (FIGS. 5a, 6c).

Differences in saw types also indicate the agency of two different people, as discussed by Springate and Raes (2013). In the example given, one end of a long-bone segment was cut with a coarse-bladed saw, while the other end was cut with a small-toothed saw. The former cut was interpreted as the product of a slaughterhouse worker and the latter cut as the product of the retail butcher (Springate and Raes 2013: 16–17). This interpretation may be correct, but the arguments presented above suggest that the coarse-bladed saw could have also been wielded by a home butcher. Examining the cortical (exterior) surfaces of the bone for score marks could provide support for the agency of professional butchers but the point here is that there may well have been a non-professional third party modifying the bones consumed by that household.

Another example of a “co-butchered” bone may be found in steak or chop segments with non-parallel sawed surfaces. This occurs when one end was sawed perpendicular to the bone's axis, while the other end was sawed at an angle, creating a meat cut of uneven thickness (FIG. 7). One of the benefits of single-meal cuts like chops and steaks is that they lie flat in the pan but meat unevenly cut will also unevenly cook. Again, the business needs of retail butchers would have discouraged them from selling poorly cut steaks and chops, so it may be deduced that these bones were derived from retail or wholesale pieces that were further portioned at home. The author of *The Complete Cook*

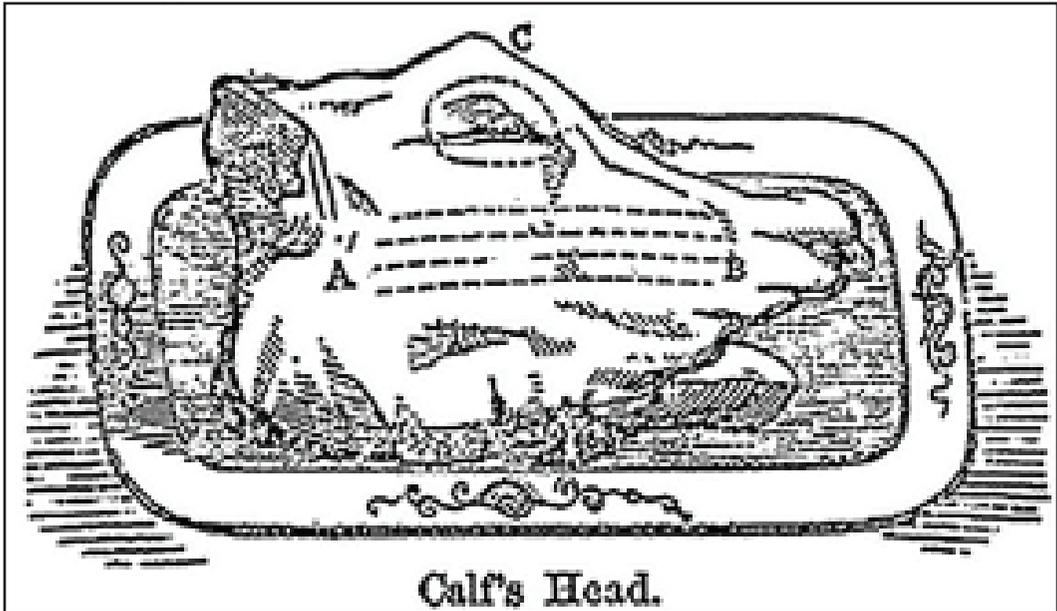


Figure 8. "Carve from A to B, cutting it quite down to the bone ... remove the eye with the point of the knife [C] ... there are some tasty, gelatinous bits around it that are palatable" (Hale 1854: 457). (illustration from Ellet [1857: 110]; courtesy of Michigan State University Libraries, Gerald M. Kline Digital and Multimedia Center.)



Figure 9. Parallel cut marks indicate systematic meat removal. (Photo by David Tuttle, 2014.)



Figure 10. Cut marks and recycled bones, clockwise from top: (a) a reused pig femur; (b) a pig femur with deep, random cut marks; and (c) a reused bone fragment. (Photo by David Tuttle, 2014.)

seemed to realize that home cooks may not always butcher meat neatly, so, for “Marrow Bones” he wrote: “Saw the bones even, so that they stand steady ... upright in a sauce pan” (Sanderson 1864: 106). This step would have facilitated both cooking and serving. Analysts may use this recipe or others like it for interpretation, as evenly sawed shank segments may have been served as marrow bones, while unevenly sawed, chopped, or broken pieces were more likely used for soup.

Cut marks produced in a domestic setting probably result from kitchen preparation, carving, and, on certain elements, from skinning. It may be difficult to distinguish the functional origins of these marks, in contrast with the distinctive score marks ascribed to professional butchers. Skinning is assumed by analysts to be one of the basic steps in primary butchering (Landon 1996; Seetah 2006), but is most likely to be observed on elements like feet or heads, in which the skin lies close to the bone. Skinning may not be apparent on even these elements, since they were often boiled

and may not have needed preliminary skin removal. In fact, retaining the skin was desirable in recipes like “Mock Turtle Soup” (Sanderson 1864: 44). It is therefore unlikely that an urban, domestic assemblage will contain many bones with the telltale signs of skinning.

It may be difficult to determine whether other cut marks were created during kitchen preparation or during carving/service. Some cookbooks described or illustrated carving methods that may leave distinctive butchery-mark patterns on bones (FIG. 8):

Calf’s Head affords a great variety of excellent meat, differing in texture and flavor, and therefore requires a judicious and skillful carver properly to divide it. Cut slices longways under the eye, taking care that the knife goes close to the bone. ... The eyes are considered great delicacies by some. They should be taken out with the point of your knife, and each cut in two. A piece of the palate (which lies under the head), a slice of the tongue, with a portion of the brains, should be given to each guest. On drawing out the jaw-bone, some delicious lean will be found. (Sanderson 1864: 173)

In the absence of such detailed instruction, analysts attempting to use the placement or clustering of cut marks to determine whether meat was removed in the kitchen or carved at the table may not be particularly successful. Parallel cuts could occur if raw meat was systematically removed for cooking, but they might also indicate that meat was formally carved at the table (FIG. 9). Dense clusters of marks (FIG. 10b) could be the sign of a canny cook removing all scraps of meat to chop into pieces, or casual table carving performed with little concern for careful portioning. Either way, these types of marks are unlikely to have originated at the butcher shop. Experimental work comparing cut marks made before and after cooking may help answer this question.

It is worth noting that, with the exception of score marks, cut marks are usually found on bones from larger pieces of meat, such as roasts. Individualized portions like steaks are unlikely to show carving/meat-removal cuts on their cortices because the bones would rest on the sawed interior surface. A cook or diner seeking to cut meat off a steak bone would apply downward pressure alongside the bone, causing little damage to the bone itself or, at most, creating a scrape mark on the exterior rather than a slicing cut mark.

If cut marks *are* observed on the cortical surface of a steak-sized bone, then one may infer a very particular chain of cooking events. The first step involved removing meat from a large, roast-sized bone (such as a ham). This could occur during preparation for a particular recipe or during table service. The second step occurred sometime afterwards, when the now-meatless bone was segmented with a saw. Why would a cook take the trouble to saw up a bone after the meat had been removed? The answer is expressed in a recipe for “Savory Stew” from *Cookery and Housekeeping* (A Veteran Housekeeper 1886: 192): “Cold meat ... may be made more agreeable, when properly prepared, on its second appearance on the table than on its first. ... Take some bones of beef *from which meat has been cut* [and] break into small pieces [emphasis added].” This

recipe calls for using leftovers as the basis for stew by reusing a denuded bone. Most soup or stew recipes relied on fresh, meaty bones to provide flavor, body, and nutrition but no doubt it was also a common practice to use a leftover bone. Meaty shins and shanks were usually cracked to introduce marrow into the broth and the flavor potential of a leftover, meatless bone would be greatly improved with additional butchering. The fragment depicted in Figure 10c is a good example of a reused bone, as it has carving marks on its cortical surface, and the ends were partially sawed, then broken. The Figure 10a specimen with the deep, oblique groove was also reused. The cook started to saw the larger bone into segments, but after completing at least one division she apparently abandoned further effort.

Recording Butchery Marks

Analysts working with urban faunal assemblages may find that some of the usually recorded variables are less useful than they are in prehistoric or rural contexts. For example, determining the age at death is important for establishing patterns of seasonal game harvesting or livestock husbandry practices. These patterns may be less informative in urban contexts where individual households have little or no influence on the ages at which animals are slaughtered. Similarly, zooarchaeologists working with urban assemblages may use quantitative alternatives to the standard minimum number of individuals (MNI) in recognition of the fact that market transactions typically involve pieces of beef, pork, or mutton, rather than individual cattle, pigs, or sheep. Though some data may be rendered less meaningful in an urban context, this article argues that butchery marks have the potential to augment traditional analytical approaches. There are, however, difficulties with this approach that must be considered prior to discussing its interpretive potentials.

The first challenge to this approach is the obvious fact that not every bone has butchery marks. Leaving aside taphonomic forces that

may obscure or remove butchery marks, it is important to acknowledge that not all meat-processing activities create a mark. For example, a retail butcher might slice through meat without actually leaving a score mark, or a cook may select a recipe that does not require further butchering of the bone.

Recording the basic types of butchery marks (saw, chop, etc.) present on a specimen is a routine practice, and several published methods may be used to describe the mark location(s) and identify retail meat cuts in a quantifiable way (Azzizi et al. 1996; Landon 1996; Lyman 1977). Some butchery signatures may be recorded using these or other methods, while others provide more of a challenge due to their idiosyncratic natures.

One simple method would be to expand the types of marks identified under the umbrella of “bone modification” in a standard faunal catalogue. At PAF, analysts identify isolated saw or chop marks, but may also identify combined marks (“chopped and sawed,” “scored,” etc.) and repetitive marks (“sawed in cross-section,” “false start,” etc.). Some of these categories may directly indicate butchery signatures, accepting that scoring is associated with professional butchering and false starts are more likely to occur during household butchering. Additional data may be recorded for cross-sectioned bone pieces, which may be measured for thickness and quantified by type/cut of meat. Recorded examples of uneven cross-sections may be used to interpret household butchery. Analysts at PAF also use a “comments” entry in the catalogue to record specific butchery-mark descriptions. Alternatively, this information may be drawn on bone diagrams.

The real difficulty with these methods is in quantification. Steak bones may be counted, measured, and compared between contexts, but the value of identifying butchery signatures may be more about adding nuance to an analysis than about adding quantifiable data. Even simple designations, such as “skilled,” “unskilled,” “both,” and “indeterminate,” can be paired with descriptive comments to pro-

vide valuable information about the assemblage. In this light, the recognition of butchery signatures may not be dependent on the identification of particular meat cuts. For example, an unidentified sawed long-bone fragment might not contribute to traditional meat-cut statistics, but may, by its multiple false starts, be indicative of home butchering activities.

It is clear that some types of butchery signatures are new variables that may be easily quantified while others merely qualify existing datasets. From an analytical standpoint they are all interpretive tools that may at least enhance current strategies and in urban contexts may be more relevant than some of the classic variables.

Interpretive Potentials

Butchery signatures are a form of ancillary data that have the potential to introduce variation into relatively homogenous urban assemblages. The recognition of these signatures is the recognition of agency, which may have important interpretive implications. The following section discusses ways in which identifying butchery signatures can add nuance to faunal analysis, as well as possibilities for incorporating these observations into archaeological interpretations.

Differentiating the signatures of home butchery and retail butchery in the 19th century has implications for a variety of research topics, including aesthetics, consumption, and patterns of display. The butchered turkey carcass depicted in Figure 2 was clearly prepared for an impressive meal and it is likely that other elements of the meal were also meant to impress diners. Other aesthetically motivated butchery procedures may occasionally be identified, similar to the whittled “duckbill” on a leg-of-lamb bone (Corson 1885: 318–319) or the carefully cleaned neck bones for “Cutlets à la Maintenon” (Leslie 1840: 109). Historical archaeologists have long examined assemblages of ceramics, glass, and flatware in order to identify patterns of social display associated with the service of food. Meat-cut identifica-

tion has played a role in these analyses, including MacDonald and Needs-Howarth's (2013) reconstruction of formal meals, which synthesized tableware, faunal, and cookbook data. Attention to butchery signatures may add another dimension to this type of research. Those elements that indicate an emphasis on aesthetics may be of particular value to research into the sensory experience of dining, as discussed by Mary Beaudry (2013).

The identification and interpretation of butchery signatures may also help tease out differences in tool use among archaeological contexts. A perusal of historic cookbooks demonstrates that, despite the increased availability of sawed retail cuts in 19th-century urban contexts, the need for home processing of meat and bone was not fully eliminated. Butchery signatures offer researchers the opportunity to study the persistence of home butchery in these urban contexts. A good example may be found in Cheek and Friedlander's (1990: 56) work with Washington, DC, assemblages. They observed differential cleaver and saw usage among households in an ethnically mixed neighborhood and hypothesized that these households were shopping at racially segregated retail butcher shops. The possibility that these differences could reflect the relative predominance of home butchery in some households should also be explored. The results may reflect ethnic or class distinctions in an unexpected way.

Reitz et al. (2006: 118) suggested using the combined evidence of butchery marks and meat-cut counts to identify and distinguish household and retail processing practices. Their suggestion was made in the context of identifying urban husbandry practices, though these data could also be used to research patterns of rural retail meat consumption. While the focus here has been on urban assemblages, butchery signatures can also enhance understanding of production and consumption in rural contexts. Consider, for example, Christine Szuter's analysis of a late 19th-century Arizona trading post where the "family members were not choosing and buying meat from their local

butcher; they were the local butcher as well as the consumer" (Szuter 1991: 79). Such a site forms a bridge between professional processing, in a time period when retail standardization was the norm in more urban settings, and home or farmstead processing of animals, which may be idiosyncratic. Szuter found that, while beef bones were usually butchered with saws, knife marks were occasionally present "in conjunction" (Szuter 1991: 84). This vague description could be referring to professional score marks or kitchen/carving marks made by the cook. Identifying the exact relationship of cut and saw marks through catalogued descriptions or diagrams could enhance such an analysis and inform researchers investigating the distinctions between urban and rural assemblages, as well as sites where professional butcher(s) resided.

Susan Henry's (1987: 26) work in urban Phoenix included two households with resident meat cutters. She suggested that their presence could have influenced meat acquisition, though the meat-cut data from these sites were not substantially different from that of the other households in the study. Examination of butchery signatures could add another dimension to this inquiry. Would there be fewer examples of amateur butchering from a site occupied by professional butchers? If so, were the meat cutters provisioning the household directly from the store, as Henry speculated? Or were they offering their expertise at home through instruction or simply by performing the labor themselves?

Finally, the identification of butchery signatures is the identification of gendered agency in the butchering process. Decades ago, Diane Gifford-Gonzalez (1993) recognized an implicit bias common to zooarchaeological studies that assumed prehistoric butchery was performed exclusively by "Man the Hunter." Landon (2005: 25) suggested that historical foodways research could also benefit from an explicit consideration of gender roles in the division of household labor. This article has demonstrated that, while "Man the Butcher" may have provisioned urban households with pre-cut pieces of

meat, women were occasionally leaving their marks on the zooarchaeological record.

The bias that Gifford-Gonzalez observed was rooted in 20th-century thinking, which in turn evolved from 19th-century gender ideals. Butchering was viewed as men's work, a distinctly gendered role. Even within the private sphere of a domestic kitchen, meat-related activities may sometimes have been viewed as less than genteel (Pipes and Janowitz 2013: 81). Some cookbook authors reinforced this ideology, particularly Marion Harland, author of *Common Sense in the Household* (1873). She wrote for "lady-housekeepers" and occasionally urged her readers to be deferential: "It is best to make your butcher or hired man skin [a rabbit] before you undertake to handle it" (Harland 1873: 169). Cookbooks instructed women how to select retail meat cuts (a necessary skill in 19th-century urban contexts) and parley with the butcher for special orders, but only occasionally instructed women to butcher meat themselves. Schweitzer (2010: 175) devoted considerable space to discussing butchery diagrams that she argued were intended to "fill the gaps in women's knowledge," but the gaps she refers to were in the understanding of meat selection and preparation, not in butchery per se. That women did perform butchering tasks is evident from cookbook instruction and from archaeological evidence of amateur butchery marks.

This discussion seems to set up a dichotomy suggesting that neat/regular/professional=male and sloppy/irregular/amateur=female. This dichotomy is not meant to denigrate the performance of women or elevate the abilities of men. The reasons these gendered differences emerged have been discussed throughout this article, including the effects of urbanization and the associated loss of butchering knowledge by women living off the farm. The dichotomy also reflects a reality of 19th-century housewifery, whereby a woman needed to be a "Jill-of-all-trades" in order to manage a home. In contrast, retail butchers needed to master their craft in order to compete in the urban marketplace, but, as

with any trade, the work was narrowly focused on a group of closely related tasks. Women working in the home were the ultimate multitaskers and, as such, were more likely to be generalists than specialists. While purchasing meat from a market was convenient for women faced with a myriad of responsibilities, there was still need for occasional butchering. Trial and error was the likely regimen for many women and, as discussed earlier, cookbooks were generally unhelpful in this regard. Despite a cultural aesthetic that favored ladylike women working with sugar and fruit (Pipes and Janowitz 2013: 81), 19th-century cooks regularly processed meats and butchered bones as needed. With butchery signatures, their efforts can now be recognized within the archaeological record.

Conclusion

Though retail butchers may have produced regional variations in the name, size, and anatomical representation of meat cuts (Schweitzer 2010: 184–186), one characteristic likely remained constant for the trade: quality control. Self-interest in a competitive marketplace would have prompted butchers to maintain a level of professionalism by ensuring that their methods and presentation were sufficient to attract and retain a customer base. The pressures of competition for consumers informed by published shopping guides ensured that retail butchers produced reliably marketable meat. Product appearance influences consumer choice and neatly butchered cuts would have been more easily marketed than poorly butchered cuts. Bones are archaeological proxies for meat and, as such, their appearance demonstrates the butcher's skill and the quality of his products. The archaeological signatures of 19th-century retail butchers include, most notably, the presence of score marks on sawed bones; the diagrams in Landon (1996) suggest that this phenomenon may not have occurred during 18th-century butchering episodes. Other characteristics include machine-aided butchering in some regions (Windham

2003) and a general regularity of portion, including parallel sawed surfaces for transverse or bias-cut segments.

Contrast this with the hallmarks of the idiosyncratic home butcher, whose work did not benefit from daily practice and who may have grappled with unfamiliar animal anatomy, an inappropriate workstation, the physical demands of sawing and chopping bones, and/or poor tool selection. These conditions could result in a variety of distinctive butchery marks, including repetitive chopping or sawing, false starts and abandoned cuts, bone spurs caused by partial sawing and breaking, non-parallel sawed surfaces and awkwardly portioned cuts, and recycled bones. Home butchery signatures like these can be a source of variation in urban assemblages that may otherwise appear relatively homogenous.

Ultimately, the value of identifying butchery signatures lies in adding nuance to faunal analysis and, by extension, to historical interpretations. Butchery signatures have the potential to offer new levels of data to assemblages or to suggest alternative interpretations of assemblages and sites. As artifacts of human activity that have been previously overlooked in most faunal analyses, they may contribute to the more holistic approaches to foodways research that have emerged in recent years (e.g., Metheny 2013). Butchery signatures can also enhance understanding of marketplace interactions and the gendered division of labor by giving researchers the tools to recognize the role that “Woman the Butcher” had in the creation of urban zooarchaeological assemblages.

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