CALVERT INTERIM REPORT NO. 6

Preliminary Analysis of Vertebrate Remains from the Calvert Site in Annapolis, Maryland and a Comparision with Vertebrate Remains from Sites in South Carolina, Georgia, and Jamaica

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for

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December, 1987

Prepared with funds from Grant RO-21482-87
National Endowment for the Humanities, Washington, D.C.

PREFACE

Calvert Interim Reports are a series of technical reports issued by Historic Annapolis, Inc. They are intended for circulation among professional archaeologists and historians in the mid-Atlantic region and are a means of disseminating information about the Calvert Site prior to publication of the final report. The series is funded, in part, by a grant from the National Endowment for the Humanities and by Historic Annapolis, Inc.

The Calvert Site was excavated as part of a salvage operation between 1982 and 1984 under the direction of Dr. Anne Yentsch. It is one of the richest sites--quantitatively and qualitatively--that Archaeology in Annapolis has worked upon and ultimately the artifact assemblages from other sites in the city must be measured against the baseline it provides for the early and late 18th-century urban Chesapeake.

Excavation of the site was funded by federal, state, and local government agencies; private donors were also generous. The following provided financial support through grants and donations to Historic Annapolis, Inc.

The National Endowment for the Humanities; Historic Annapolis, Inc.; the City of Annapolis; the Colonial Dames of America, Chapter 1; the Historic Inns of Annapolis; the Maryland Commission on the Capital City; the Maryland Heritage Committee; the Maryland Humanities Council; the Society for the Preservation of Maryland Antiquities; the First Maryland Foundation, Inc.; Middendorf Foundation; Black and Decker, Inc.; the Rouse Company; and Paul Pearson.

Without the foresight and the concern for preserving Annapolis' fragile archaeological record that Paul Pearson, Pringle Symonds, and St. Clair Wright showed throughout this project, no research on the Calvert Site would have been possible. The work done on the Calvert Site demonstrates that when a preservation agency such as Historic Annapolis, Inc. is able to work closely with a developer who takes their interest in preservation as his own, it is possible to save much of a site that would otherwise be destroyed by construction.

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October 1988

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Abstract. Zooarchaeological evidence from the Calvert House, Annapolis, is compared to that from several southern Atlantic coastal plain sites. Although all sites are located in estuarine settings, less evidence for the use of seafood is found at either Governor Calvert's house or at urban sites on the southern coastal plain than at rural sites from the sea islands near Charleston. In other respects, the southern coastal plain data and data from the Calvert site are not similar. This may be related to the elite social status of the Calvert Household as well as to environmental differences between the Mid-Atlantic and the southern region. Finally the evidence from these Atlantic coast sites are compared to data from eighteenth century plantations in Jamaica in order to underscore the observation that early English subsistence in the New World was diverse and exhibited regional variation.

INTRODUCTION

Comparative research in historical archaeology is an undertaking which most of us would agree needs to be done. Most of us would agree also that there are many obstacles to accomplishing the task. On the other hand, people do not live the same through time and space so that variability among data sets reflecting depositional histories, ethnicity, socioeconomic status, temporality, technology, and environment is an inherent source of confusion. On the other hand, methodological approaches hamper comparisons, especially when more than one scholar is involved in the work. As a case in point I will review zooarchaeological evidence from three areas in which the methodological approach is held constant by virtue of holding the chief analyst constant.That is, all of the research summarized here was done under my supervision using identical methods and research paradigms.

As will be seen, the differences among faunal collections from Maryland, the southern coastal plain, and Jamaica are so profound that the comparative conclusions appear superficial. The results raise serious questions about the appropriateness of maintaining the identical analytical standards which made the comparisons possible in the first place. The most important result of the comparison, however, is not superficial for it underscores the fact that while human behavior conforms to general laws of thermodynamics, ecology, and culture, the ways people find to conform to those laws are diverse. This is the part that makes the prospect of future research exciting. At the same time, the importance of uniformity in excavation and analytical approaches is also emphasized so that the problems associated with comparative research are not compounded unnecessarily.

As has been discussed on numerous occasions, differences in depositional processes, recovery methods, analytical methods, and sample sizes must be considered when doing inter-site comparisons. All profoundly influence zooarchaeological samples and efforts must be made to assess their influence before characteristics associated with ethnicity, socioeconomic status, temporality, or environment can be confidently evaluated. Too often these variables are ignored, although they are among the primary reasons data on subsistence from many sites are often inadequate and non-comparable. I am not going to discuss these factors here, however, not because I do not think they are important but because I have discussed them at length elsewhere (Reitz 1986b).

I will elaborate on both topics by reviewing the vertebrate evidence for subsistence from (1) the southern coastal plain, especially around Charleston and Savannah; (2) the Calvert House, Annapolis, Maryland; and (3) two plantations in Jamaica. Temporally these deposit span most of the eighteenth century and the first half of the nineteenth. Socially, the data are from sites occupied by slaves, planters, governors, merchants, working class families, and prostitutes. Functionally, the sites are either residential or combine both residential and commercial activity areas. Environmentally all of the sites are coastal, but represent three distinct zoogeographic provinces. Both rural and urban data are included.

URBAN/RURAL CONTRASTS ON THE ATLANTIC SOUTHERN COASTAL PLAIN

The first zooarchaeological data in the comparison are from rural and urban sites associated with Charleston, South Carolina, founded in 1610, and Savannah, Georgia, founded in 1733 (Reitz 1986a). These two cities served as market centers for a large rural population. The rural sites from which zooarchaeological samples have been drawn were primarily sea island plantations. The data is presented in Table 1.

Table 1. The Composition of urban and rural faunal assemblages on the southern coastal plain.

	Urban Sites		Rural Sites	
	MNI	%	MNI	%
Domestic mammals	167	28.9	172	17.2
Domestic birds	114	19.7	41	4.1
Wild mammals	47	8.1	192	19.2
Wild birds	44	7.6	30	3.0
Turtles/alligators	31	5.4	137	13.7
Fishes	114	19.7	383	38.4
Commensal taxa	61	10.6	43	4.3
TOTAL	578		998	

Table 1 indicates that the urban diet on the southern Atlantic coastal plain during the late eighteenth century was somewhat different from the contemporaneous rural diet on nearby plantations. Urban residents apparently utilized more meat from domestic animals that did rural people and they obtained these individuals from a wider range of species. Emphasis on domestic food sources included greater use of domestic birds. Jointly with this high use of domestic animals, perhaps because of it, wild animals were used to a less extant at urban sites, and there was a more restricted range of wild species exploited. Although statistical diversity was not calculated due to uncertainty about the role of sample size in the resultant values, urban diets appear less diverse than rural ones. In this data set, I counted turkeys and Canada Geese as wild birds because there are no morphological changes or demographic profiles which might suggest domestication. If turkeys and Canada geese are counted as domestic species, the contrast between rural and urban diets becomes even greater.

One of the chief ways in which urban and rural subsistence differed was in the use of domestic mammals. Not only might urban residents have used more domestic individuals, but it appears that they might have used a greater variety of domestic species. Cattle (*Bos taurus*) were somewhat more abundant than caprines (*Ovis aries* and *Capra hircus*, 25 individuals). While only nine rural individuals were caprines, 16 caprines were identified from urban sites. Eight of the rural caprines were from a single plantation, whereas caprines were identified from all five urban sites. In addition to these major species, two domestic rabbits (*Oryctolagus cuniculus*) were identified.

Urban subsistence in this region is also characterized by higher levels of domestic bird consumption. Chickens (*Gallus gallus*) were the most abundant fowl in both rural and urban collections (95% and 93% of the individuals respectively), but a wide variety of other birds were used at urban sites. Only one domestic bird other than a chicken was identified from a rural site. This was a muscovy duck (*Cairina moschata*). Three of the urban collections had other domestic birds. These were five rock doves (*Columba livia*) and three muscovy ducks.

It also appears that urban diets included fewer wild mammals than did rural diets. Not only do urban assemblages contain fewer wild individuals, but they also have fewer wild species. At urban sites, the wild mammal most consistently used was deer (*Odocoileus virginianus*). Deer contributed 66% of the wild mammal individuals in rural collections. Additional wild mammals identified from urban collections were opossum (*Didelphis virginiana*), rabbit (*Sylvilagus* spp.), squirrel (*Sciurus* spp.), raccoon (*Procyon lotor*), and mink (*Mustela vison*). These same species were found in rural collections, which also contained bobcat (*Felis rufus*), skunk (*Mephitis mephitis*), and otter (*Lontra canadensis*).

Urban diets apparently included more wild bird individuals but fewer species than rural diets. Birds pose a problem for this type of analysis in that it is not always clear which species were wild. At least some Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), and turkeys (*Meleagris gallopavo*) were domesticated by the mid-1800s since show standards for these birds were established by that time (American Poultry Association 1874). Native wild populations of these birds also inhabit the Atlantic coastal plain. If these three species were in fact domesticated, then their abundance in urban samples only serves to strengthen the argument that urban diets included more domestic birds and a wider variety of domestic species than did rural sites. There is no osteological evidence that there birds were domesticated, although their numerical prominance is suspicious. Urban diets may have emphasized only two 'wild' bird species: 39% of the wild birds identified from urban collections were turkeys and 20% were Canada geese. The remaining wild birds were various species of ducks (Anatidae), herons (Ardeidae), rails (Rallidae), and small perching birds (Passeriformes). Rural diets incorporated a wider range of wild species. Only 10% of the wild birds from rural collections were turkeys and no Canada geese have been identified. Rural wild birds also included cormorants (*Phalacrocorax auritus*), ducks (Anatidae), herons (Ardeidae), ibis (*Eudocimus albus*), clapper rails (*Rallus longirostris*), sandpipers (Scolopacidae), owls (*Strix varia*), hawks (*Buteo* spp.), crows (Corvidae), and other passerine birds.

Fish apparently were not as extensively used in urban diets as in rural ones. Although all fish found archaeologically were probably obtained fresh, when fish are absent or rare in archaeological deposits it does not necessarily mean that fish were rarely consumed. Commercial fishing might be responsible for the paucity of fish remains in urban deposits. Methods of preserving fish may render them almost invisible in the archaeological record (Cumbaa 1981; Faulkner 1985:67). Salted fish were often shipped without heads and with most of the vertebrae removed and even locally fresh fish may have been filleted before being sold.

Commensal species may have been more common at urban sites that they were at urban ones. Commensal species include non-pets such as moles (*Scalopus aquaticus*), rodents (*Sigmodon hispidus*, *Neotoma floridana*, *Peromyscus* spp., *Rattus* spp., and *Mus musculus*), frogs (*Rana* spp.), and pets such as cats (*Felis domesticus*), dogs (*Canis familiaris*), and horses (*Equus caballus*). All of these animals might have been consumed, but they are also commonly found in association with human dwellings. Vermin (non-pets) were less common in urban samples than in rural ones. At rural sites, 95% of the commensal individuals were vermin, 5% were cats and dogs. No horses were identified. At urban sites, 79% of the commensal individuals were vermin, 18% were cats and dogs, and 3% were horses. This may indicate that vermin were more abundant in rural areas or at least more closely associated with human activity areas, and that pets were probably buried further from residences at rural sites than at urban ones. The presence of horses in urban collections may be a reflection of the mixed commercial/residential nature of many deposits.

An interesting conclusion may be drawn from both urban and rural collections. Using simple percentages of MNI as a measure of subsistence strategies, it appears that general status was not as influential a factor in forming the diet as a rural location (Table 2). The diets of both slaves and planters included fewer domestic meat sources than did the diets of urban residents regardless of status. Likewise, based on vertebrate faunal collections, diet in upper class households, represented here by a collection from Gibbes house -- a wealthy merchant household -- was similar to those from other upperclass urban households represented in the southern coastal plain collections (Ruff 1986b).

Table 2. Slave, planter, and urban merchant (represented by the Gibbes household) faunal assemblages

	Slave		Planter		Gibbes	
	MNI	%	MNI	%	MNI	%
Domestic mammals	89	20.5	71	15.0	8	29.6
Domestic birds	13	3.0	26	5.5	4	14.8
Wild mammals	107	24.7	61	12.9	1	3.7
Wild birds	9	2.1	16	3.4	5	18.5
Turtles/alligators	45	10.4	84	17.8	2	7.4
Fishes	159	36.6	191	40.4	5	18.5
Commensal taxa	12	2.8	24	5.1	2	7.4
TOTAL	434		473		27	

When the actual number of species identified from various sites is compared, however, there is evidence that status was an influence affecting the formation of these archaeological samples. It is difficult to demonstrate this point using minimum numbers of individuals, and risky given the small samples, but planters seem to have included a greater range of species in their diets than did overseers and slaves while wealthy people in the city perhaps enjoyed greater dietary variety than did less affluent individuals living in the same city. This conclusion is tempered by the knowledge that archaeological and documentary evidence is rarely precise enough to do more than broadly define relative socioeconomic status of deposits. Further, the majority of the urban samples are from middle class or artisan/craftsmen deposits, while most of the rural samples are from either slave or wealthy planter deposits. At the moment it is not possible to compare, for example, samples from deposits of urban slaves with those from rural slaves or deposits left by urban craftsmen with those from rural farmers or craftsmen.

CALVERT HOUSE

BACKGROUND. The Calvert site is located in the center of Annapolis, the capital city for the Province of Maryland since 1695 (see Figure 1). Annapolis is located on the mid-Atlantic coastal plain at the mouth of the Severn River in the upper reaches of Chesapeake Bay (Figure 2). Its aquatic, estuarine environment is mesohaline. Its shoreline contains small creeks, coves, and marshlands. The town has a humid, temperate climate marked by seasonal variation, moderate temperatures, and abundant rainfall. The most prevalent types of wildlife in the late colonial era appear to have been aquatic birds, fishes, and reptiles. Domesticated animals, maintained for the most part on outlying farms, included the range of domesticates common to other Anglo-American communities. Tobacco was the main crop, but grain production became more important as the eighteenth century progressed.

Although occupied by a number of different people between 1650 and the present, the focus of the research project at the site was on the Calvert occupation, begun in 1728 when Governor Charles Calvert purchased the property. The Calvert occupants of the site were an elite and politically powerful family, related by close kinship ties to the proprietory Lords Baltimore. In fact, two of the occupants of the house in the era 1728-1735 were younger brothers of the 6th Lord Baltimore (also named Charles Calvert).

The Calvert family made extensive alterations to an earlier house. When Governor Charles Calvert died in 1734, ownership passed to his wife Rebecca. When Rebecca died the same year, ownership passed to his daughter Elizabeth. Elizabeth Calvert married her cousin Benedict Calvert in 1748 and they remodeled the house at least three times, resulting in substantial additions to the archaeological record. One of the features reported on here, a hypocaust (Feature 5 shown in Figure 3),

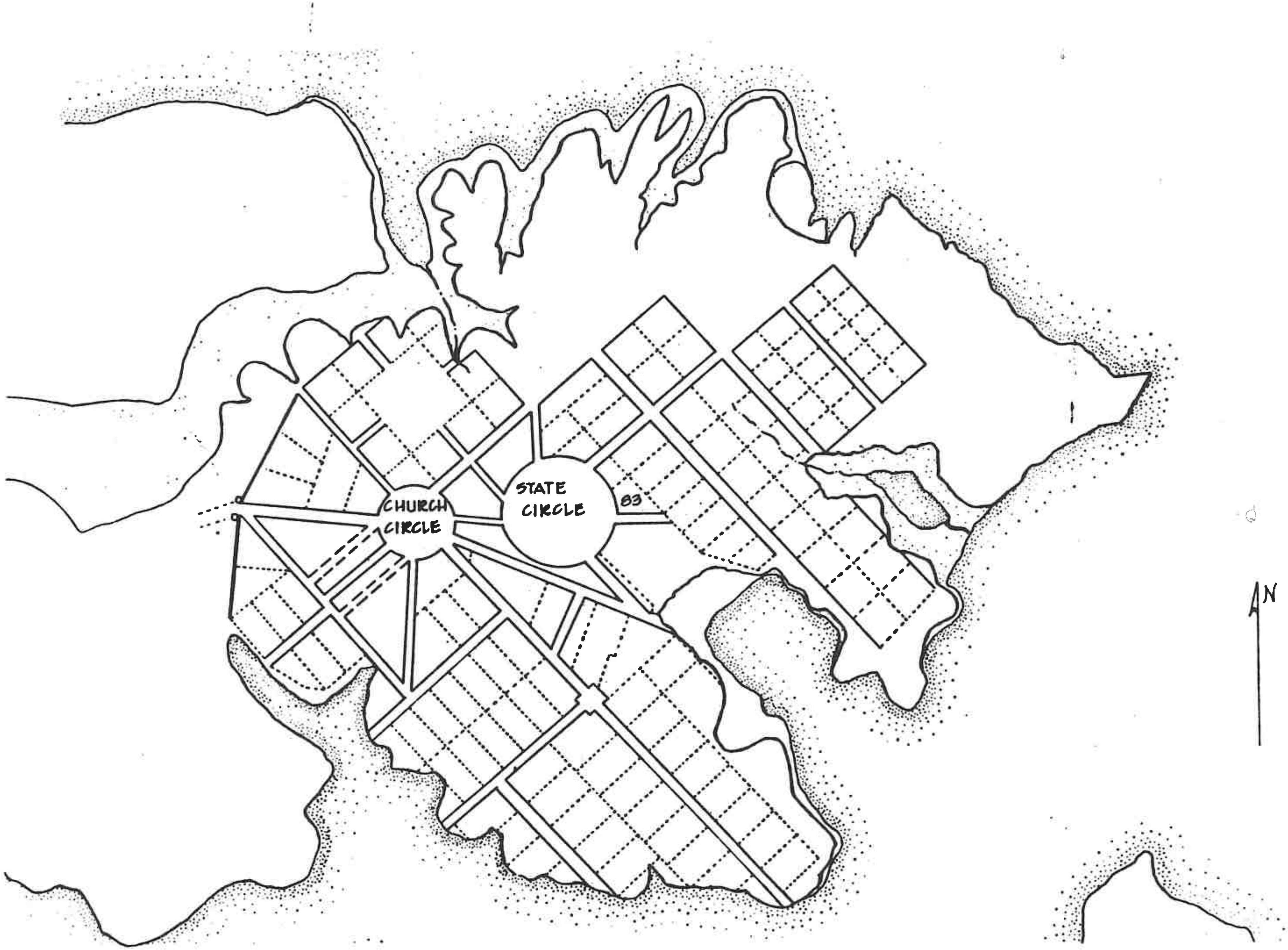


Figure 1. The 1695 Nicholson plan of Annapolis showing Lot 83 adjacent to State Circle. The Calvert site is located in the western half of the lot (drawing by Hanna McKee).

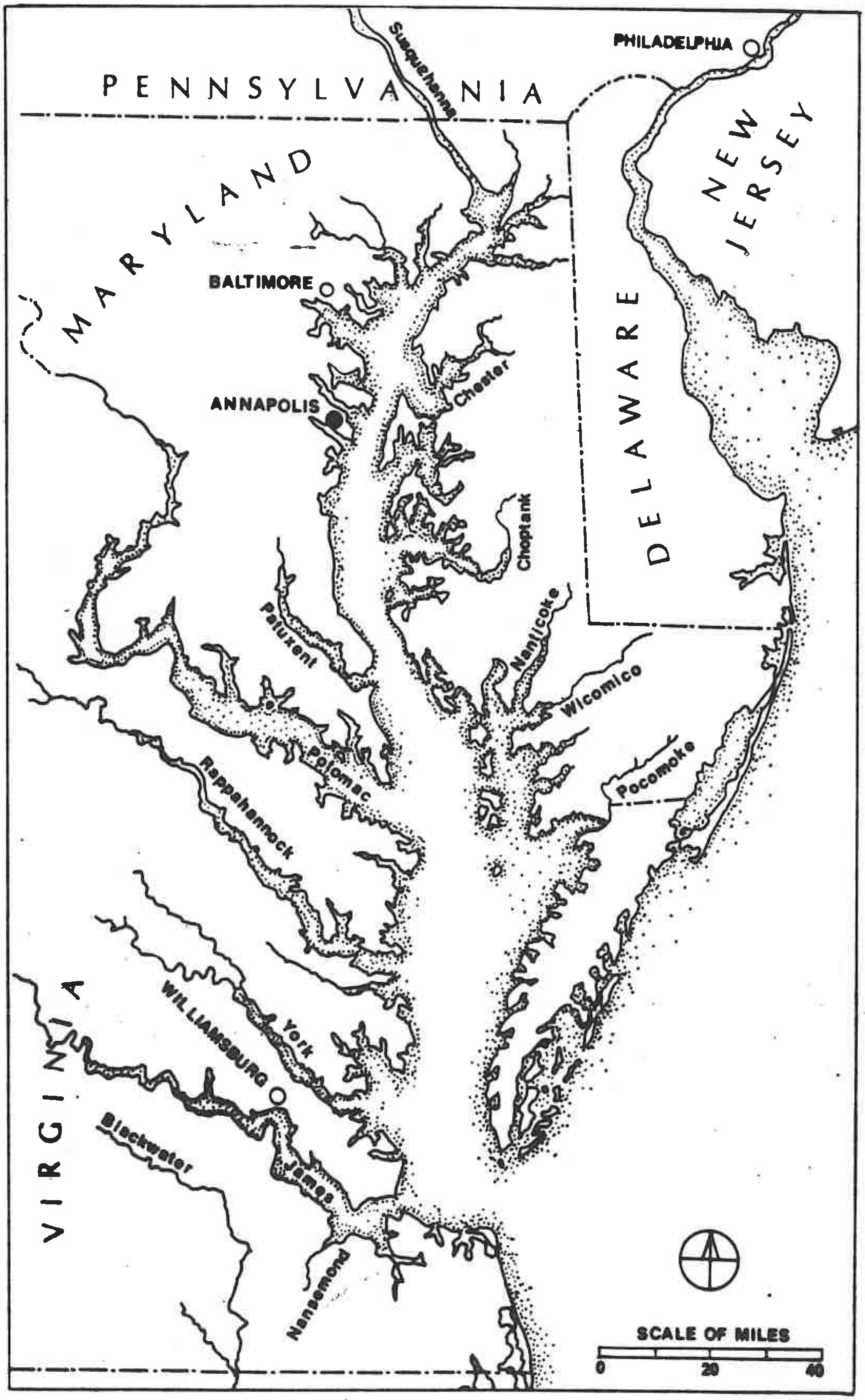
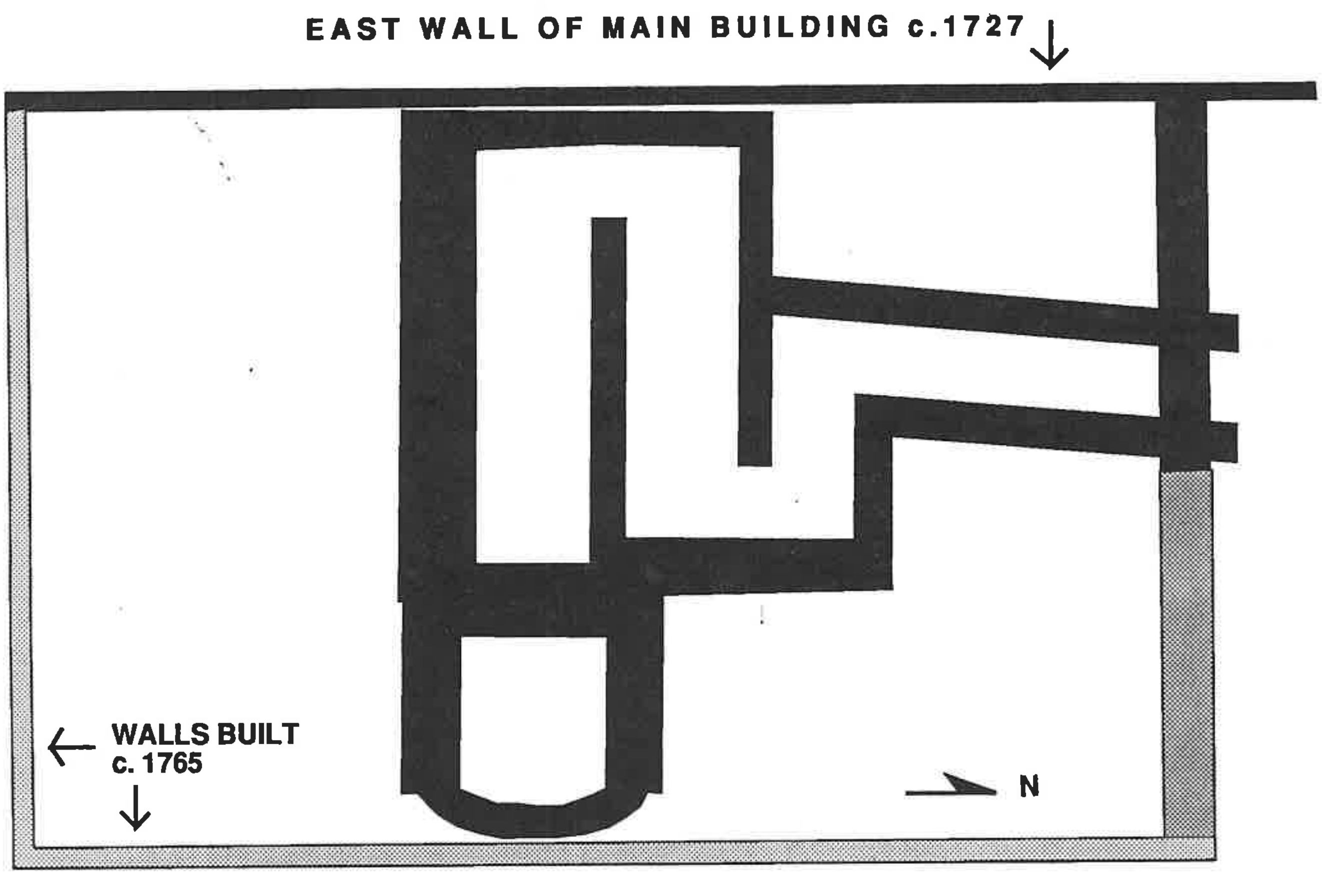


Figure 2. Map of the Chesapeake region showing the location of Annapolis (drawing by Hanna McKee).

Figure 3. Foundation of the hypocaust within the c. 1765 crawlspace at the Calvert Site. Feature 5 was the deposit beneath the rubble layer that lay inside the hypocaust. Feature 5A consisted of the first 1-3" of the rubble/construction debris that lay across the entire crawlspace while Feature 5B was the deposit outside the hypocaust from a depth of 3" to 12" that was spread across the yard surface when the hypocaust was demolished c. 1765.



was a dry-air brick heating systems rare in the English colonies. This one was probably used to heat an orangery. The other feature, a brick-lined well, (Feature 121) was constructed about 1730 and cleaned about 1750. In the 1760s, the hypocaust and the well were sealed although the well was not fully filled. The house was used as a barracks for officers in the Revolution and, as part of the post-war cleaning-up process in the 1785, the floorboards in the addition over the hypocaust were restored/replaced (briefly re-opening the feature), and the well was filled to the surface and leveled.

After the revolution the house became a family residence--a use that continued until the mid-twentieth century when it became first a multi-family dwelling and then a hotel. The entire first floor of the eighteenth century home is incorporated into the hotel. Most of the zooarchaeological evidence reported here was associated with a household with high social and economic rank, an interpretation which is supported by the location of the structure, the identity of the occupants in the 1700s, and the presence of the hypocaust.

Zooarchaeological analysis of materials from the Calvert House was organized using our knowledge of diet in the southern coastal plain, as well as upon research conducted by Henry Miller at other sites in the Chesapeake (1985). Due to its more northerly location, we anticipated that caprines (sheep/goats) would be more common at Calvert House, perhaps even more common than either cows or pigs. Based on urban location, it was anticipated that chickens would be more common than wild birds such as turkeys and Canada geese. Since the Mid-Atlantic maritime province is less rich than the Carolina Province, it was anticipated that fish would be minor taxa, and because of the location of Annapolis high in the Bay, it, was anticipated that species used would be primarily inshore, estuarine species. It was further anticipated that departures from this model would be explicable in terms of environmental or socioeconomic variables.

Since this work is currently in progress and none of the data have been published, a summary of the methods and current results are provided here. It should be noted that the methods are in all aspects identical to those used in the study of the Charleston and Jamaican collections.

METHODS AND MATERIALS. Field work at the Calvert House was initiated in 1982 by Anne Yentsch, for Historic Annapolis, Inc. The material recovered from two large deposits, the fill inside a hypocaust (Feature 5) and the fill used to level its surrounding yard (Features 5a, and 5b), and from a brick-lined well (Feature 121) are analyzed here. Faunal materials were recovered from both features using 1/4-inch mesh hardware cloth. About a third of Feature 5 was also recovered using fine-meshed window screens.

The vertebrate materials recovered were examined using standard zooarchaeological methods. Identifications were made by Timothy Young, Jennifer Freer, and Barbara Ruff using the comparative skeletal collection of the Zooarchaeological Laboratory, Department of Anthropology, University of Georgia. Bones of all taxa were counted and weighed to determine the relative abundance of the species identified. A record was made of identified elements. Age, sex, and bone modifications were noted when observed. The elements identified as well as butchering marks such as cutting, slicing, or hacking were also sketched to facilitate comparisons among sites. Where preservation allowed, measurements were taken of all elements following the guidelines established by Angela von den Dreisch (1976).

Minimum Number of Individuals (MNI) were determined based on paired elements and age. In calculating MNI, faunal materials recovered from each feature excavated were considered discrete analytical units, but levels and zones within each feature were combined analytically. While MNI is a standard zooarchaeological quantification medium, The measure has several problems. MNI emphasizes small species over large ones. This is easily demonstrated by a hypothetical sample which consists of twenty rabbits and one cow. While twenty rabbits represents a larger number of individuals, the single cow will supply a substantially larger meat yield.

A further problem with MNI is the inherent assumption that the entire individual was utilized at the site. From ethnographic evidence we know that this is not necessarily the case, particularly for larger individuals and in areas where markets were involved in redistribution (White 1953, Thomas 1971). Additionally, MNI is influenced by the manner in which data from archaeological proveniences are aggregated during analysis. The aggregation of separate samples into one analytical whole, or the "minimum distinction" method (Grayson 1973), allows for a conservative estimate of MNI. On the other hand, a modification of this approach is called for when analysis discerns discrete sample units. Increasing the number of analytical units generally increases the number of individuals estimated. Furthermore, some elements are simply more readily identified than others and the taxa represented by these elements may appear more significant in the species list than they were in the diet.

Biomass determinations attempt to compensate for problems encountered with MNI. Biomass provides information on the quantity of meat supplied by the animal. In some cases, the original live weight or size of the animal can also be estimated. The predictions are based on allometric principle that the proportions of body mass, skeletal mass, and skeletal dimensions change with increasing body size. This scale effect results from a need to compensate for weakness in the basic structural materials, in this case, bone. The relationship between body weight and skeletal weight is described by the allometric equation:

$$Y=aX^b$$

(Simpson, Roe, and Lewontin 1960:397). Many biological phenomena show allometry described by this formula (Gould 1966, 1971). In this equation, X is the skeletal weight or a linear dimension of the bone, Y is the quantity of meat or the total live weight, b is the constant of allometry (the slope of the line), and a is the Y-intercept for a log-log plot using the method of least squares regression and the best fit line (Casteel 1978; Wing and Brown 1979; Reitz and Cordier 1983; Reitz et al. 1987). A given quantity of bone or a specific skeletal dimension represents a predictable amount of tissue due to the effects of allometric growth. Values for a and b are obtained from calculations based on data at the Florida State Museum, University of Florida and the Department of Anthropology, University of Georgia. The allometric formulae used here are presented in Table 1 in the Appendix.

Allometry is used to predict two distinctive values. One of these is kilograms of meat represented by kilograms of bone where X is the archaeological bone weight. This is a conservative estimate of biomass determined from the faunal materials actually recovered from the site. (The term "biomass" is used to refer to the results of this calculation). Biomass reflects the probability that only certain portion of the animal were used on site. This would be the case where preserved meats or redistributed meats were consumed. On the other hand, when X is a linear measurement of a skeletal dimension such as defined by Dreisch (1976) for mammals and birds, scaling predicts the total live weight or total length of the animal. The total live weight estimate is used to assess the size of livestock and fish. It does not imply that the entire animal was consumed. Total live weight estimates have not yet been made for animals identified from the Calvert House.

Sample Size Bias. Biomass and MNI are subject to sample size bias. Casteel (1978), Grayson (1979), and Wing and Brown (1979) suggest a sample size of at least 200 individuals or 1400 bones for a reliable interpretation. Small samples frequently will generate a short species list with undue emphasis on one species in relation to others. It is not possible to determine the nature or the extent of the bias, or correct for it, until the sample is made larger through additional work.

Relative ages. Relative ages of the species identified were noted based on observations of the degree of epiphyseal fusion for diagnostic elements. When animals are young the area of growth between the shaft (diaphysis) and the proximal or distal ends of a bone (the epiphysis) is not fused. This line fuses when growth is complete. While environmental factors influence the actual age at which fusion is complete (Watson 1978), elements fuse in a regular temporal sequence (Gilbert 1980; Schmid 1972; Silver 1963). During analysis, bones identified were recorded as either fused or unfused. The bones were then placed into one of four general categories based on the age in which fusion normally occurs. This is most successful for bones which fuse in the first year or so of life, and which are found unfused in the archaeological sample and for fused bones which fuse at three or four years of age. Intermediate bones are more difficult to interpret. An element which fuses before or at eighteen months of age and is found fused archaeologically could be from an animal which died immediately after fusion was complete or many years later. The ambiguity inherent in age grouping is somewhat reduced by recording each element under the oldest category possible.

Body Parts. The presence or absence of certain elements in an archaeological sample may provide additional data on butchering and animal husbandry practices. The elements recorded from the Calvert House were summarized into categories by body parts. Head category includes all material from bones associated with the cranium and mandible. Teeth are their own category. The presence of head elements at a site may indicate either the consumption of cuts such as calf's head soup, or the discard of unused refuse. Vertebrae included the atlas and axis, but not the sacrum. Forequarters include the scapula, humerus, ulna, and radius. These are major meat bearing elements. Forefeet include carpals and metacarpals, elements which do not contain much meat and may be evidence of slaughtering refuse, use of the feet for broth, or household manufacture of by-products such as gelatin or glue. Hindquarters include the innominate, sacrum, femur, patella, and tibia. These elements have usually been considered favored cuts of meat since they are major meat bearing elements. The hindfeet include the tarsals and metatarsals. The feet contain bones identified only as metapodials and phalanges which could not be assigned to other categories. These data are summarized in Figures 1-3. On the figures distal metapodials and phalanges are entered on the off-hind foot. This does not mean they are from the right hindquarter, but rather that the quarter was not determined. Likewise shadings of ribs and vertebra are generalized in terms of location.

Faunal Categories. In order to summarize the data, the species identified in the Calvert House collection have been placed into faunal categories based on vertebrate class and husbandry practices. Domestic mammals include pigs (*Sus scrofa*), cows (*Bos taurus*), and caprines (*Ovis/Capra* sp.). Caprines include both sheep and goats and are identified as such due to the difficulty of distinguishing their bones as either sheep or goat. Wild mammals include opossums (*Didelphis virginiana*, rabbits (*Sylvilagus* spp.), squirrels (*Sciurus* spp.), and deer (*Odocoileus virginianus*). Commensal taxa include rats (*Rattus* spp.) , dogs (*Canis familiaris*), cats (*Felis domesticus*), horses (*Equus caballus*), and poisonous snakes (Viparidae).

Domestic birds include chickens (*Gallus gallus*) and possible peafowl (*Pavo real*). Wild birds include ducks (*Anas* spp., *Aythya affinis*), Canada geese (*Branta canadensis*), turkeys (*Meleagris gallopavo*), and pheasants (*Phasianus colchicus*). Canada geese and turkeys may actually belong to the category of domestic birds. According to the American Poultry Association (1874) standards of excellence for these two species had been established by the mid-eighteenth century. At this point in time they are considered as wild birds since that has been a standard interpretation for them in the collections from the southern coastal plain. Still, there is increasing evidence that this may be inappropriate at the Calvert site.

It should be noted that only biomass for taxa for which MNI had been determined is included in the summary table. For example, biomass for UID Fish is not included, while biomass for *Anas* spp. is.

RESULTS. The faunal sample recovered from the Calvert House is substantial, containing over 173 individuals identified from 12,086 bone fragments weighing 22 kg (Table 3). Overall, bone preservation was good to excellent. Features 5 and 121 have individually provided large and interesting samples, although at this time both features are only about half identified. It should be noted that the data are from two features formed as relatively short-term depositions, and therefore do not represent daily subsistence of the Calvert household over an extended period of time. Yentsch assumes that the deposits at the site were left by a single household or by a very limited set of near-by high status households based on the high proportion of expensive ceramics recovered from the deposits and on the fact that the deposits were in walled areas of the site. I also assume that the debris is from the Calvert household rather than a neighboring one, since it is unlikely that anyone would actually throw trash into a neighbor's yard, especially if the neighbor was one of the most politically powerful individuals in the province.

Based on the identification of the Calvert House fauna, domestic animals formed a substantial part of the diet at the mansion (Tables 3 and 4). In terms of individuals, domestic mammals contributed 83% of the biomass and included 12% of the individuals. Cattle (*Bos taurus*), the dominant domestic taxon, contributed 10 individuals, supplied 87% of the domestic mammal biomass, and contributed 72% of the sample biomass (Table 3). Pigs (*Sus scrofa*) were second in terms of biomass. They contributed 6 individuals, 9% of the domestic mammal biomass, and 8% of the sample biomass. Caprines (*Ovis/Capra* spp.) were represented by 2% of the individuals. They supplied 4% of the domestic mammal biomass and 3% of the sample biomass. Domestic birds were a common component of the sample, particularly chickens. While chickens (*Gallus gallus*) contributed 15 individuals, they supplied 1% to the sample biomass. A possible peafowl (cf. *Pavo real*) was a minor component of the identified domestic bird fauna.

Although wild mammals were present in the faunal materials recovered, they do not appear to have been a major component of the diet. Of particular interest was the paucity of deer (*Odocoileus virginianus*) remains. Deer were represented by 1 individual and contributed less than 1% of the sample biomass. Opposum (*Didelphis virginiana*), rabbit (*Sylvilagus* spp.), squirrel (*Sciurus* spp.), and raccoon (*Procyon lotor*) were also identified. These may actually represent commensal species rather than part of the diet. There is documentary evidence for the English colonies that these animals were eaten in some, if not all, regions of North America, and these animals are also frequently found at other colonial and Federal sites in situations which clearly indicate consumption.

Wild birds made a significant contribution to the Calvert House faunal collection, contributing 25% of the individuals identified from the site. Turkeys (*Meleagris gallopavo*) and Canada geese (*Branta canadensis*) were common, together contributing 23 individuals. Several other ducks were identified including mallard (*Anas platyrhynchos*) and scaup (*Aythya* spp.). Both of these species frequently inhabit the coastal wetlands and reed marshes but are seasonal residents in the Chesapeake Bay region. Four possible ring-necked pheasants (cf. *Phasianus colchicus*) were identified. While there are some native pheasants (ruffed grouse, (*Bonasa umbellus*)), ring-necked pheasants were introduced by Europeans in the 1880s to improve local hunting (Bent 1963). They are considered wild since the intention was to turn them loose, but it is possible that the actual birds identified at the Calvert House were domesticated, if the tentative identification is found to be supported upon further consideration. The number of domestic and wild individuals and the variety of species identified from the Calvert House is largely a result of the decision to classify birds as wild or domestic along the same lines followed for the southern coastal plain. Canada geese, mallards, turkeys, as well as pheasants all could represent domestic, at least tamed, fowl at Calvert and wild fowl in Charleston. This is a topic which will require further thought when final analysis of the collection begins.

Fishes were identified from each of the two Calvert House features. Fourteen different species of fish were identified representing both freshwater and marine habitats. While a total of 48 individuals were identified, fish contributed only 2% of the biomass for taxa for which MNI had been estimated. Two of the species identified commonly inhabit freshwater, although some members may be found in estuaries. These were gar (*Lepisosteus* spp.) and catfish (*Ictalurus* spp.). Several are taxa more typically found in freshwater settings only. These include sunfishes (Centrarchidae) and perch (*Perca flavescens*) The remaining individuals are marine species often identified from historic sites on the Atlantic Seaboard, and include black drum (*Pogonias cromis*), sea trout (*Cynoscion* spp.), porgies (Sparidae), and temperate basses (Percichthyidae).

Commensal taxa identified from the Calvert House include rats (*Rattus* spp., *Rattus norvegicus*, *Rattus rattus*), a dog (*Canis familiaris*), a cat (*Felis domesticus*), a horse (*Equus caballus*), and a poisonous snake (Viparidae). Although historically many of the commensal species were consumed by human (Wing and Brown 1979:11), they are frequently found associated with domestic and commercial structures and may have been introduced into the archaeological assemblage by accident.

Table 3. Calvert House species list

	Count	MNI #	MNI %	Weight (grams)	Biomass kg	Biomass %
MAMMALS						
Unidentified	5201			2389.73	30.9348	11.7
Unidentified (large)	1535			5860.48	66.7051	25.2
Unidentified (small)	89			13.64	0.2763	0.1
Didelphis virginiana (Opossum)	15	1	0.6	8.87	0.1876	0.07
Sylvilagus spp (Wild rabbit)	44	4	2.3	23.08	0.4460	0.2
Unidentified Rodent	30			1.43	0.0363	0.01
Sciurus cf. *carolinenis* (Grey Squirrel)	17	2	1.2	9.37	0.1970	0.07
Rattus spp. (Rat)	367	32	18.6	80.08	1.3697	0.5
Rattus norvegicus (Norway rat)	23			12.34	0.2525	0.1
Rattus rattus (Roof rat)	27			12.26	0.2510	0.09
Canis familiaris (Dog)	6	1	0.6	12.10	0.2480	0.09
Procyon lotor (Raccoon)	2	1	0.6	0.95	0.0251	0.01
Felis domesticus (Cat)	1	1	0.6	1.0	0.0263	0.01
Equus caballus (Horse)	1	1	0.6	190.1	2.9586	1.1
Artiodactyl	88			350.24	5.1278	1.9
Sus scrofa (Pig)	143	6	3.5	812.37	11.4147	4.3
Odocoileus virginianus (Deer)	1	1	0.6	6.23	0.1365	0.05
Bos taurus (Cow)	261	10	5.8	9541.22	105.9969	40.0
Caprine (Goat/sheep)	60	4	2.3	271.39	4.3601	1.6
Capra hircus (Goat)	2			17.6	0.3475	0.1
Ovis aries (Sheep)	11			57.59	1.0243	0.4
BIRDS						
Unidentified Bird	1103			657.39	7.6083	2.9
Unidentified Bird (Juvenile)	52			28.52	0.4307	0.2
cf. Anatidae (possible duck)	2			19.32	0.3022	0.1
Anatidae (Duck)	99			104.16	1.3999	0.5
Anas spp. (Duck)	53	6	3.5	56.48	0.8058	0.3
Anas platyrhynchos (Mallard)	2			5.46	0.0957	0.04
Aythya spp. (Scaup)	65	7	4.1	63.91	0.8976	0.3
Branta canadensis (Canada goose)	90	8	4.7	337.91	4.1279	1.6
Phasianidae (Pheasant family)	121			190.62	2.4263	0.9
Colinus virginianus (Bobwhite)	5	1	0.6	0.79	0.0165	0.01
Gallus gallus (Chicken)	110	15	8.7	148.44	1.9939	0.8
Meleagris gallopavo (Turkey)	168	15	8.7	768.21	8.7560	3.3

Table 3 continued. Calvert House species list

	Count	MNI #	MNI %	Weight (grams)	Biomass kg	Biomass %
cf. *Phasianus colchicus* (possible ring-necked pheasant)	15	4	2.3	26.83	0.4074	0.2
cf. *Pavo real* (possible peafowl)	1	1	0.6	0.15	0.0036	tr
Capella gallinago (Common snipe)	1	1	0.6	0.24	0.0056	tr
Turdus migratorius (Robin)	2	1	0.6	0.24	0.0056	tr
Chelydra serpentina (Snapping turtle)	2	1	0.6	7.77	0.1095	0.04
Viperidae (Poisonous snake)	1	1	0.6	0.41	0.0574	0.02
FISHES						
Unidentified Fish	741			69.94	1.0498	0.4
Lepisosteus spp (Gar)	1334	2	1.2	132.65	1.4455	0.5
Esox spp. (Pickerel)	25	8	4.7	2.29	0.0581	0.02
Opsanus spp. (Toadfish)	1	1	0.6	0.06	0.0033	tr
Siluriformes (Catfishes)	9			0.95	0.0197	0.01
Ictalurus spp. (Bullhead catfish)	12	3	1.7	4.35	0.0832	0.03
Ariopsis felis (Hardhead catfish)	11	2	1.2	2.95	0.0558	0.02
Bagre marinus (Gafftopsail catfish)	2	2	1.2	0.91	0.0182	0.01
Percichthyidae (Temperate basses)	6	4	2.3	0.4	0.0129	tr
Morone spp. (Temperate basses)	87	16	9.3	18.03	0.3364	0.1
Centrarchidae (Sunfishes)	11	1	0.6	0.93	0.0164	0.01
Perca flavescens (Yellow perch)	9	3	1.7	0.9	0.0252	0.01
Caranx spp. (Jack)	1	1	0.6	0.08	0.0042	tr
Lutjanus spp. (Snapper)	11	2	1.2	1.14	0.0307	0.01
Sparidae (Porgies)	3	1	0.6	0.92	0.0147	0.01
Cynoscion spp. (Sea trout)	5	1	0.6	0.50	0.0233	0.01
Pogonias cromis (Black drum)	2	1	0.6	13.86	0.2722	0.1
UID Bone				195.64		
TOTAL	12086	173		22535.42	265.2416	

Table 4. Calvert House Summary				
	MNI		Biomass	
	#	%	kg	%
Domestic mammal	20	11.6	121.7717	82.9
Domestic bird	16	9.3	1.9975	1.4
Wild mammal	9	5.2	0.9922	0.7
Wild bird	43	24.9	15.0224	10.2
Turtle	1	0.6	0.1095	0.07
Fish	48	27.8	2.4001	1.6
Commensal taxa	36	20.8	4.66	3.2
TOTAL	173		146.9534	

Body Elements. The elements identified from the Calvert House are tabulated in Table 5 and recorded in Figures 3-5. The distribution of elements for cows, pigs, and caprines indicates use of cuts of meat from the entire carcass at the site. Head elements identified from all three taxa include cranial fragments and upper teeth suggesting on-site butchering was taking place. The large number of cow horn cores from Feature 121 is particularly interesting. Deer, on the other hand, were represented by the hindquarter only. While this uneven distribution of elements may indicate that deer were slaughtered outside the urban area and brought to the market dressed, it may also simply reflect the low number of deer elements identified. The horse was identified from a left scapula blade.

Table 5. Calvert House element distribution

	Artiodactyl	Pig	Deer	Cow	Caprine	Goat	Sheep
Head	2	25		60	4		1
Teeth	2	39		26	6		
Vertebrae	16	11		45	4		
Forequarters	13	13		47	14	1	3
Forefeet	1	6		2	4		3
Hindquarters	13	15	1	34	12	1	
Hindfeet	4	14		12	2		3
Feet	4	17		15	11		1
Ribs	31	3		19			
Sternum	2			1			
Hyoids					3		
TOTAL	88	143	1	261	60	2	11

Bone Modifications. Modifications to the bones include cutting, burning, hacking, slicing, sawing, and gnawing (Table 6). The dominant modifications were gnawing marks, 31% of the modifications observed. Most of the rodent-gnawed bones were from birds. Cut marks (22% of the modifications) probably represent incisions left by a knife defleshing the meat from the bone and may have been inflicted either as a result of the preparation techniques or during consumption. Burning occurred in 19% of the cases were modifications were observed.

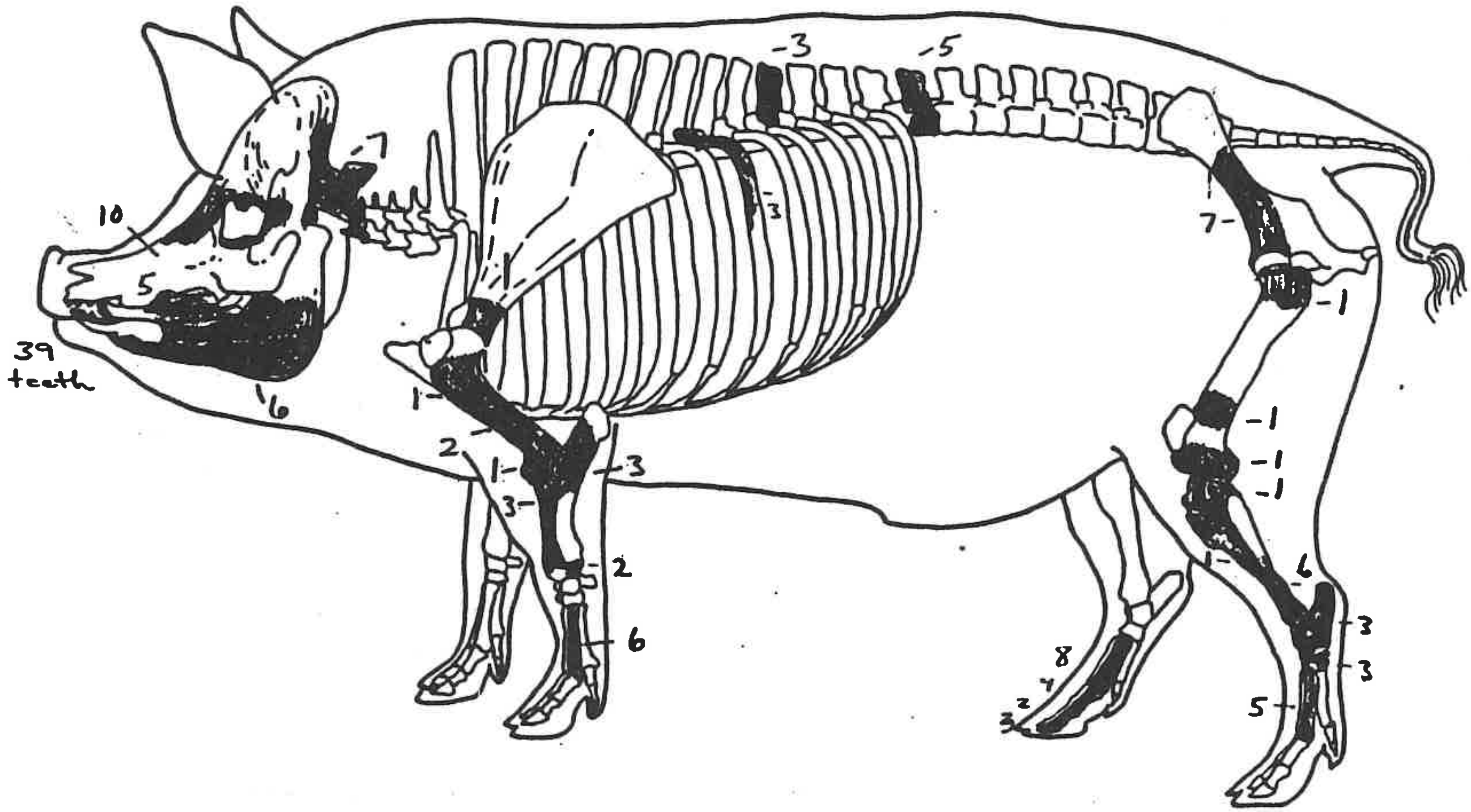


Figure 3- Pig Elements Identified from the Calvert Site

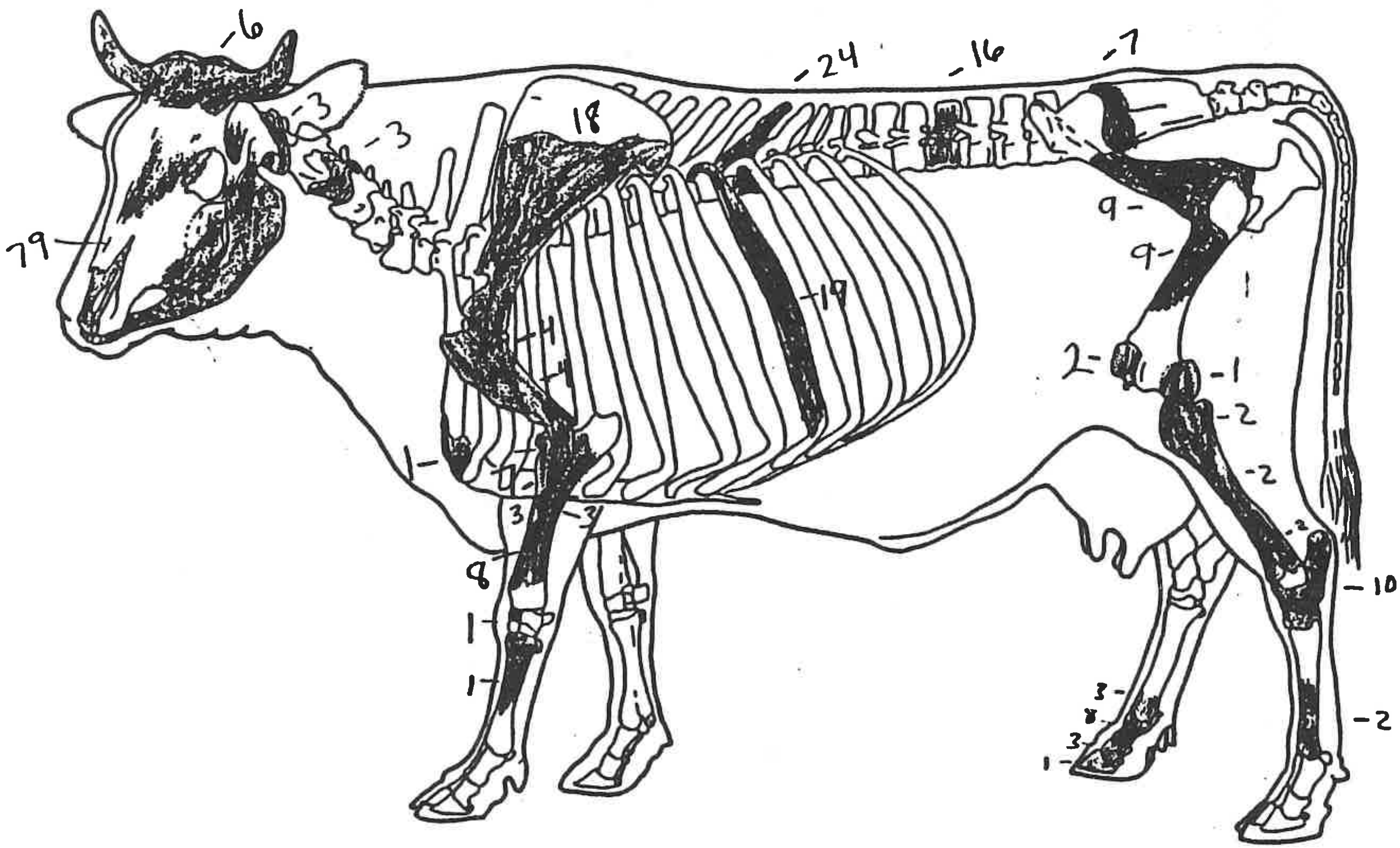


Figure 4- Cow Elements Identified from the Calvert Site

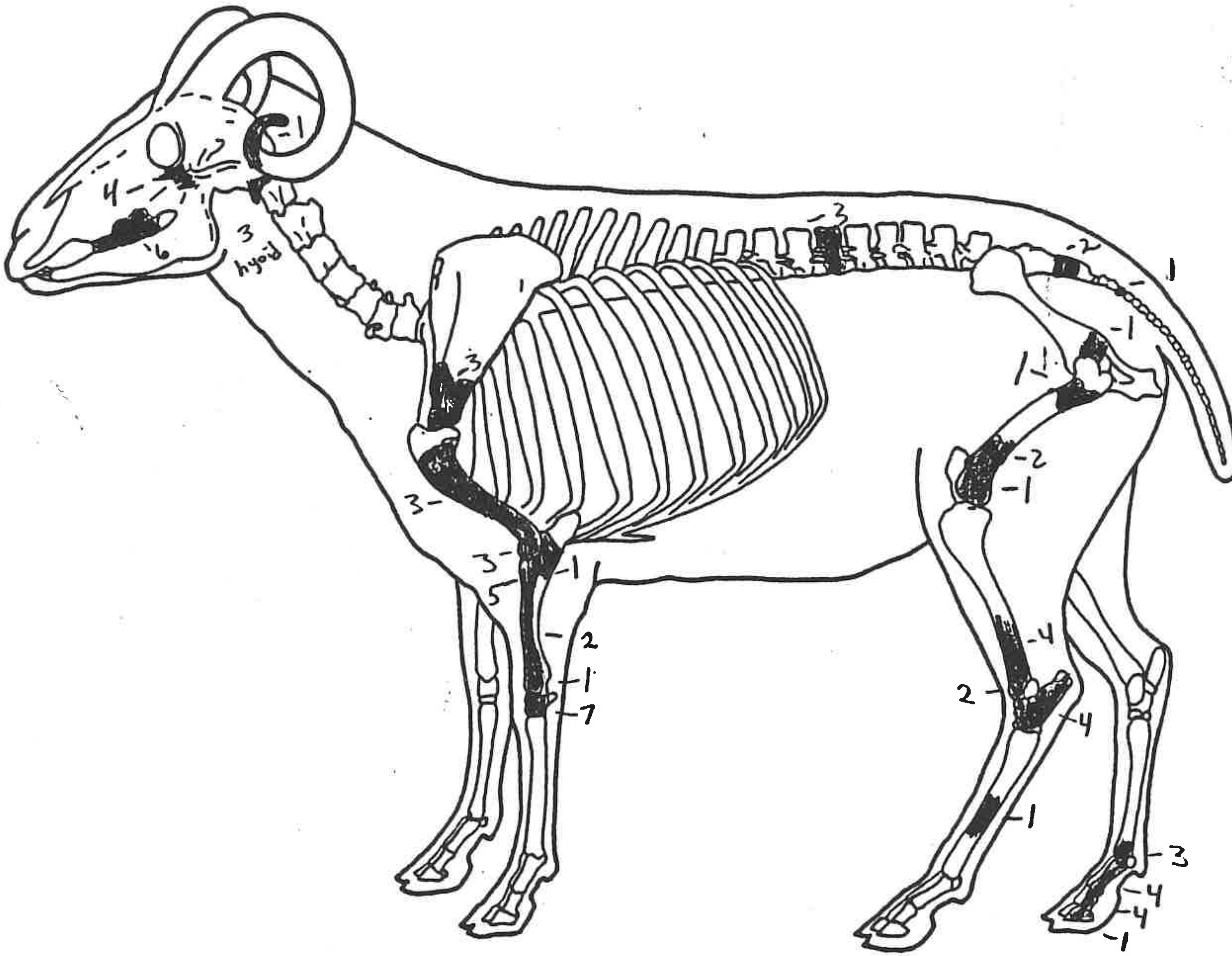


Figure 5- Caprine Elements Identified from the Calvert Site

Burning of bone could result not only from preparation for consumption, particularly roasting, but actually as a post-depositional phenomenon. Nine percent of the sample had been hacked. Hack marks closely resemble cut marks in their shape and irregularity but are deeper and wider. They may indicate the use of a cleaver in butchering (Gust 1983). A small portion of the modified bones were gnawed or chewed by dogs. As with rodent-gnawed bones, most of these were bird bones. Sliced bones were ones which had smoothed, clean surfaces such as would be found on bones which had been sawed, but lacked the striations typical of sawed bones. Sliced bones comprised 2% of the modified bones. The striations typical of sawing were found on less than 1% of the modified bones and entirely on mammal elements. A final modification was found associated with bird bones in Feature 5. Many birds bones were entire shafts with distal and proximal ends removed. The agent responsible for removing the ends has not been confidently identified. It could have been the rodents or dogs, or it could have been human.

Table 6. Calvert House bone modifications

	Rodent Gnawed	Cut	Burned	Calcined	Hacked	Dog Gnawed	Sliced	Sawed
UID Mammal	65	21	127	93	7	2		1
UID Lg Mammal	3	59	39	25	41		5	
Rabbit	1							
Rat	2	3				1		
Dog				1				
Artiodactyl	6	7	3		4	3		2
Pig	3	5	1		3	1	2	1
Cow	3	23			33	1	13	4
Caprine	2	8		1	7		2	
Goat		1				1		
Sheep		1			1			
UID Bird	155	29	15	4		13		
Duck family	8	13				4		
Duck		9						
Scaup	5	4	1			1		
Canada Goose	17	18	1	1		2		
Pheasant	20	8				5		
Bobwhite		1						
Chicken	10	6				5		
Turkey	30	20				5		
cf. Peafowl		1						
cf. Pheasant	1	2						
UID Bone	1		16					
TOTALS	332	239	203	125	96	44	22	8

Age at Death. The number of bones which can be referred to a general age at death suggested by epipheseal fusion is presented in Tables 8 and 9. Few of the animals identified from the Calvert House can be assigned a relative age. It does appear, however, that a significant number of individuals did not reach fully matured adulthood. Two of the pig individuals were less than 18 months of age at death, three were juvenile or subadults, and one was an adult. One of the cows was a juvenile at death, two were probably subadults at death, two were adults, and five were indeterminate, probably subadults or adults. The opossum was a juvenile. The dog was probably a young adult, based on unfused caudal vertebra. No other dog bones were identified which provide better indicators of age. Quite a few of the unidentified bird bones were from young animals. At least one turkey was a subadult, providing the principal evidence that these may have been domesticated birds rather than wild.

Table 7. Pig bones by age group

Less than 2 years of age	10
At least 2 years of age	8
Less than 3 years of age	18
Three years of age or older	1
Total	37

Table 8. Cow bones by age group

Less than 1.5 years of age	5
At least 1.5 years of age	18
Less than 3 years of age	10
3.5 years of age or older	4
Total	37

Some evidence for sex and pathologies was observed. Medullary bone was noted on six chicken bones indicating the consumption of laying hens (Rick 1975). No evidence for male birds was identified. Some of the rodents and three possible caprine bones showed evidence of pathologies. The cause of these pathologies has not yet been identified.

It can be seen that the Calvert House data do not conform in many respects to the urban model based on the Charleston data, or to modifications based on work with rural Chesapeake sites. The amount of domestic mammals consumed was considerably higher than anticipated, and the bulk of this domestic mammal was from cow rather than sheep or goats. Caprine individuals were less prominent than cows or pigs in the Calvert collection just as members of this subfamily are in more southerly collections. The wild bird/domestic bird contrast is largely based on the analytical organization of these two groups. What is done with birds currently classified as wild in the final analysis will have a profound influence on the interpretation made of the Calvert household's dietary strategy and to comparisons of these data to samples where a different interpretation is made of status of these birds. Fish form an unexpectedly large component in the Calvert sample, although still not as large as a percentage of the individuals as found in rural collections further south.

These contrasts may be due to several factors. Since many of Miller's sites were located in a more rural setting, the Calvert data may represent a Chesapeake version of the rural/urban contrast identified for the southern coastal plain. The Calvert data are from the third and fourth quarters of the eighteenth century rather than the seventeenth and early-eighteenth centuries or the Federal period suggesting that timing may be an important factor. The large percentage of commensal taxa, primarily rats, suggests that post-deposition site formation processes might somehow have reduced the number of caprines, increased the number of wild birds, and increased the numbers of fish, although to postulate this, one has to assume that commensal taxa both brought bones to the site and carried away others according to their dietary preferences. Some of the contrasts between the urban southern subsistence strategy and what these preliminary Calvert data suggest about urban mid-Atlantic strategies undoubtedly reflect socioeconomic status or ethnicity.

Work with the Calvert data is too preliminary to discuss each of these factors in detail. Selecting one factor as an example, it does not seem likely that social status will provide a good explanation for the differences in strategy suggested by these generalized comparisons. The Calvert faunal remains are associated with an elite household. One might, therefore, anticipate some similarities with faunal assemblages from other elite houses. There is actually another vertebrate sample associated with a governor's household (Table 9).

Table 9. Comparison of the percentage of individuals from Calvert House, the Aiken-Rhett site in Charleston, and other urban Southern Coastal Plain sites.[a]

	Calvert	Aiken-Rhett	USCP
Domestic mammals	11.6	43.1	28.9
Domestic birds	9.3	12.3	19.7
Wild mammals	5.2	7.7	8.1
Wild birds	24.9	6.2	7.6
Turtle/alligators	0.6	9.2	5.4
Fish	27.8	18.5	19.7
Commensal taxa	20.8	3.1	10.6

[a]. Calvert data from this report; Aiken-Rhett data from Ruff (1986a); Urban Southern Coastal Plain data from Reitz (1986b).

The Aiken-Rhett site, in Charleston, was occupied in the early 1800s by William Aiken, a state Senator, Representative, and Governor of South Carolina. Not only do the Aiken-Rhett data not appear similar to those from the urban coastal plain pattern (based largely on other Charleston samples from less prestigious households), but they contrast sharply with those from Governor Calvert's house. Isolating the factors responsible for this contrast should be informative but this superficial comparison suggests that social status by itself is not an adequate explanation.

DRAX HALL

To further emphasize the difference found among these collections, data from a Jamaican plantation is summarized. The Jamaican environment is sharply different from that of the northern and southern Atlantic coastal plain. Much of the original vegetation was probably tropical rain forest although there were a few extensive savannahs. Freshwater streams and fishes are rare on Jamaica. Native terrestrial fauna at contact was limited to pond turtle, a few genera of snakes and lizards, and a variety of rodents and insectivores. There were no native artiodactyls: no native carnivores to plague livestock;

and no native pathogens. Marine fauna of the Caribbean Province comprise the second most diverse faunistic regions in the world., providing an especially sharp contrast to the temperate Mid-Atlantic Province. Most of Caribbean fishes are adapted to reefs and banks or to deep, offshore waters.

One of the very few plantation samples available for study is from Drax Hall Plantation, Jamaica, excavated by Douglas Armstrong. Drax Hall is located on the north coast of Jamaica, about a kilometer inland from St. Ann's Bay. Plantation deposits date from 1760 into the early 1900s (Armstrong 1985). The "Old Village" on Drax Hall Plantation was excavated by Douglas Armstrong in 1981 and 1982 using 1/4-inch mesh screen to recover artifacts. The faunal remains from the big house and the slave contexts were deposited between 1760 and 1810 while samples from transitional contexts date to the period 1810 to 1840. As shown in Table 10, domestic mammals contributed 59% of the MNI, and chickens 8% (Reitz 1986c). Pigs contributed 23% of the individuals, cows 20%, and caprines 12%.

Table 10. Comparison of individuals from planter, slave/transitional contexts at Drax Hall, Jamaica (Reitz 1986c).

	Planter	Slave/Transitional	Total
Domestic mammals	44.4	63.8	58.5
Domestic birds	5.6	8.5	7.7
Wild mammals			
Wild birds	11.1	2.1	4.6
Sea turtles	11.1		3.1
Fish	27.8	17.0	20.0
Commensal taxa		8.5	6.2

There were some differences based on status. Wild birds were far more common in samples from the big house and sea turtles were only identified in big house samples. Unlike the sea island plantations, domestic mammals contributed 44% of the individuals in the Great House sample and 64% in the slave/transitional samples. Caprines were more common in slave/transitional contexts. Although all of the samples are small, those from the Great House were somewhat more varied and contained slightly more wild taxa than did those from slave or transitional contexts.

When Drax Hall Old Village samples are compared to those from the Georgia sea island several differences are visible (Table 11). Domestic animals, particularly caprines, are more common in the Drax Hall samples than in ones from sea island plantations, and use of wild animals is subsequently lower. Although hutias, wild birds, and a freshwater turtle are found on Jamaica, the common taxa of the Georgia sea islands, or their ecological equivalents, are not found on the island so the reduced use of wild terrestrial taxa is not unexpected. It seems odd that so little effort was made on Drax to utilize the hutias, turtles, and wild birds which did exist on Jamaica, however.

The percentage of fishes used is also substantially lower in the Old Village sample than in ones from the Georgia plantations even though marine fishes are abundant in Jamaican waters. This difference could indicate that fish were processed in some fashion or in some place which precluded their recovery. The low level of fish might also mean that there were substantial differences in the way plantations in these two settings dealt with supplying themselves with foods. The Caribbean plantations might have been far more dependent upon imported supplies and plantation livestock than were the sea island plantations of Georgia.

Table 11. Comparison of the percentage of individuals from Drax Hall with rural Southern Coastal Plain Sites

	Drax Hall	RSCP
Domestic mammals	58.5	17.2
Domestic birds	7.7	4.1
Wild mammals	0	19.2
Wild birds	4.6	3.0
Turtles/alligators	3.1	13.7
Fish	20.0	38.4
Commensal taxa	6.2	4.3

Many of the contrasts found between Drax Hall and the Atlantic coastal sea island plantations could also reflect preservation. Conditions for preservation of animal bones at Jamaican historic sites are not good since the materials are not deeply buried or otherwise protected from the tropical sun. However, recently excavated materials from New Montpelier were provided by Barry Higman for faunal analysis. New

Montpelier is also located on the north coast of Jamaica. The site is further away from the coast, and is on one of the island's few rivers. The materials studied are from a slave village occupied after 1775. Although analysis is still in progress, the preliminary results indicate a strategy similar to that practiced at Drax Hall, although with more commensal taxa, including a native hutia, and a large number of freshwater turtles. It remains to be decided whether to interpret the remains of several horses as those of commensal animals or food animals.

CONCLUSION

Comparisons of faunal remains from these historic sites suggests that distinctly different subsistence strategies were practiced in each region (Table 12). The contrasts in subsistence strategies suggested by these numerical summaries undoubtedly reflect human efforts to conform to the laws of thermodynamics, ecology and culture. They suggest a number of interesting aspects of human behavior to explore. However, it should be noted that the degree of comparability which has resulted in this final comparison is deceptive. In the first place, the comparison has required glossing over individual variations among the collections and within collections. Many of the idiosyncratic characteristics of these samples might be just as interesting as the larger picture produced by inter-site comparison. In order to make these comparisons, I have not critically evaluated each sample in terms of taphonomic, excavation, and analytical biases. However, it should be understood that substantially better samples are needed before the results offered here can be considered anything more than suggestive.

Table 12. Comparison of the percentage of individuals from the Calvert House, Southern Coastal Plain, and Drax Hall

	Calvert	SCP	Drax Hall
Domestic mammals	11.6	21.5	58.9
Domestic birds	9.3	9.8	8.2
Wild mammals	5.2	15.2	
Wild birds	24.9	4.7	4.1
Turtles/alligators	0.6	10.7	2.7
Fish	27.8	31.5	20.6
Commensal taxa	20.8	6.6	5.5

Secondly, methodological impediments to inter-site comparisons are abundant. The comparisons made here have been possible only because of dogmatic insistence on my part that comparable methods be applied to all of these sample. In some cases the comparisons have been made in spite of archaeological evidence of human behavior which would be more suitably studied using different methods. If, however, modifications had been made in analytical methods, then comparability would have been reduced. For example, there is some discussion about the wisdom of making comparisons based on minimum numbers of individuals rather than butchering units. In spite of the fact that there are a number of variables which tend to make estimates of minimum numbers of individuals non-comparable among sites, these are minor compared to the difficulties that exists in the area of butchering units since there are no standard protocols for defining, reporting, or summarizing butchering data.

In order to determine the validity of the differences and similarities which seem to exist in these samples, several areas need to be given more attention. We need vertebrate faunal assemblages which have been collected using the most discriminating recovery methods and which have been carefully identified using a good comparative skeletal collection. The archaeological samples need to be larger in size and from a diverse number of contexts. Good documentary support as well as collaboration from other data classes is needed for each sample. Samples should come from a variety of temporal, social, and ecological settings. During analysis it will be necessary to remember that taphonomic and archaeological variables influence the sample. More research is needed into the impact of meat processing on preserved meats and efforts should be made to acquire documentary evidence on the costs of sixteenth century through early nineteenth century cuts of meat on the Atlantic seaboard. Discussions of the elements found in collections should be more extensive and we need to develop a better way to present the data. We need to better define the criteria which distinguish between deposits of different ethnic, social and temporal associations. If attention is paid to these factors it should be possible in the next several years to discuss subsistence in this region in terms of change through time, socioeconomic status, ethnicity, and urban/rural contrasts.

Acknowledgements. I wish to thank Anne Yentsch and Historic Annapolis, Inc., for the opportunity to examine the faunal remains from the Calvert House. I also appreciate the assistance and patience of Jennifer Freer, Timothy Young, Barbara Ruff, Lori Taylor, and Emmet Walsh. Funding for the research was provided by a grant from the National Endowment for the Humanities (Grant #RO 21482-87) to Historic Annapolis, Inc. A short version of this paper was presented at the 21st Annual Meeting of the Society for Historical Archaeology, January, 1988, Reno, Nevada, under the title "Comparison of Zooarchaeological Evidence from Annapolis and Charleston."

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APPENDIX 1

Table 1 (Appendix 1). Allometric Values [a]

	N	log a	b	r^2
Biomass, kg, from Bone Weight, kg				
Mammal	97	1.12	0.90	0.94
Bird	307	1.04	0.91	0.97
Alligator	3	0.91	0.89	0.89
Turtle	26	0.51	0.67	0.55
Snake	26	1.17	1.01	0.97
Osteichthyes	393	0.90	0.81	0.80
Siluriformes	36	1.15	0.95	0.87
Periformes	274	0.93	0.83	0.76
Serranidae	18	1.51	1.08	0.85
Carangidae	17	1.23	0.88	0.86
Sparidae	22	0.96	0.92	0.98
Sciaendae	99	0.81	0.74	0.73

[a] The allometric formula is $\underline{Y = aX^b}$, where $\underline{Y}$ is biomass, $\underline{X}$ is bone weight, $\underline{a}$ and $\underline{b}$ are scaled constants, N is the number of observations used in the regression, and r^2 is the proportion of total variance explained by the regression model (Reitz and Cordier 1983; Reitz et al 1987).