Northeast Historical Archaeology

Volume 11 Article 4

1982

Fish in Foodways Systems-Data Integration and Patterning

David Singer

Fish in Foodways Systems-Data Integration and Patterning

Cover Page Footnote
I wish to thank Gray Graffam for providing the archaeological data necessary for this research. I also thank Suzanne Spencer-Wood for her constructivie criticism and guidance throughout the course of my graduate studies.

Fish in Foodways Systems— Data Integration and Patterning

by DAVID SINGER

INTRODUCTION

Documentary data can be synthesized to produce patterning in foodways practices. Those documentary patterns can then be tested against archaeological data to determine their validity and application.

The test case will comprise primary and secondary historical data pertaining to the foodways of Harvard College students, 1651-1674; while the archaeological data will consist of the fish remains that were recovered from the excavation of the Olmstead-Goffe House site, dating to the same period.

The informational, methodological, historical and dietary aspects of ichthyofaunal studies will be integrated in the analysis of the fish remains to produce a contextual interpretation independent of the general results. The interpretation of the fish remains will then be compared and synthesized with the general results, thereby producing a more accurate reconstruction of the foodways at this site.

Site development

The condition of Harvard's Old College building fell into disrepair soon after its construction in 1638 (Morison 1936), and by 1650, additional facilities were sought for student housing. When the residential Goffe property was purchased by Harvard College c. 1651, it was soon "remodeled to accommodate students' chambers and studies" (Graffam 1981:10). As Goffe's College it contained five chambers, eighteen studies, a kitchen cellar, and three garretts (Colonial Society of Massachusetts 1925). Based upon evidence found in the steward, Chesholme's, accounts, Morison (1936) has stated that at least eleven students occupied the Goffe dormitory for the period ending June 1652 (Figure 1).

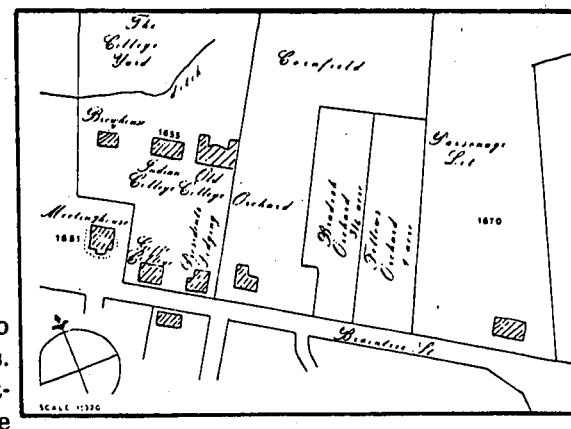

Figure 1. Development of the college yard, 1650-1675 (Morison 1936:42).

In an inventory taken in 1674, Goffe's College no longer appeared among Harvard College's list of property holdings. Graffam has stated that "presumably the building had been removed before that time or possibly destroyed by fire," and concluded that "the seventeenth-century occupation of the Olmstead-Goffe House site, both as a private residence and as a college dormitory, was between 1632 and 1674" (Graffam 1981:13).

Reconstructing 17th Century Diet

The study of diet has been approached in a variety of ways. Some of these have been based upon the study of probate inventories (McMahon 1980) and farmers' accounts (Rothenberg 1980), while others have drawn upon additional primary and historical documents (Anderson 1971). Bowen (1978) has integrated probate analysis with zooarchaeology and agricultural history, and Graffam (1982) has synthesized the historical and archaeological evidence of food acquisition, preparation, storage, and consumption.

The two most important historical sources utilized for the reconstruction of student diet have been seventeenth-century probate inventories and the Harvard steward's account book. The study of probate inventories for Middlesex County, for the period 1648-1667, revealed the range of food items that were available within the community, and that could have been selected for student consumption. The steward's account book

documented what food items had been acquired by the college for institutional consumption. The synthesis of these two dietary sources were made, and the product was compared with the archaeological foodways data. The archaeological remains indicated a distinct pattern of food consumption.

Of the 238 probate inventories for the above period, 201 or 84% were examined for food items. These included a variety of meats, grains, dairy products, fruits and vegetables (Table 1). Upon further examination, a variety of fishing-related items were also found to be present. These items included canoes, boats, fish hooks, fishing lines, leads, and one eel pot. The presence of these items documented that individuals within the community (Middlesex County) had engaged in small scale fishing activities for private consumption. The inventories revealed only two citations of fish: "a parcell of mackrill in a barr" (Singer 1980: 111), and a "parcel of dry fish" (Singer 1980: 291).

Based upon the presence of fishing equipment and marine fish (mackerel) in the inventories, the contents of a household trash disposal pattern, with regard to fish remains, may be projected. Household fish refuse may consist of both fresh water and/or anadromous, and marine fish. The former types of fish could be easily procured in relatively large quantities by inland residents. The latter type of fish could be procured by these households through market acquisition. However, the more distant a community is from accessible transportation routes the less likely that marine fish will be present. Geography and topography played an important role in community development, and it is almost certain that these factors also affected the availability and selection of food items, especially fish. Therefore, the projected household trash disposal pattern may be only applicable to inland and/or estuarine households.

In addition, a community trash disposal pattern may also be projected. Although the fish remains may be similar in nature, the quantities of these materials should be considerably higher than that contained within household assemblages. Distinctions may further exist between inland and coastal assemblages. Since the fish fare of coastal communities would probably be affected by their close proximity to commercial fish markets, coastal fish refuse may consist predominantly of marine fish.

TABLE 1
COMPILATION OF PROBATE INVENTORY
(FOOD ITEMS)

LIVESTOCK	FRUITS/VEGETABLES
Bees	Apples
Cattle	Cabbages
Goats	Currants
Poultry	Figs
Sheep	Onions
Swine	Pumpkins
	Raisins
MEAT	Turnips
Bacon	
Beef	SPICE
Dried Fish (barrel)	Almond Powder
Horse Flesh	Aniseed
Mutton	Ginger
Pork	Honey
Suet	Liquorish
	Mollasses
GRAIN	Mustard Seed
Barley	Pepper
Indian	Salt
Oats	Sugar
Peas	
Rye	MISCELLANEOUS
Wheat	Cider
Malt (rye)	Oil
Meal (rye & oat)	Rum
Flour	Wine
DAIRY	
Butter	
Cheese	

LISTED FOR MIDDLESEX
COUNTY, MASSACHUSETTS, 1648-1667.

The Harvard steward's account book contained an ongoing inventory of food items acquired by the college for the years 1651-1660. This account constituted the major source of documentation for the sorts of food items that were consumed on an institutional level. During the seventeenth century, Harvard College was supported by the residents of neighboring towns. This support usually took the form of agricultural goods, but occasional-

ly money or services were supplied. The students, their families or friends, paid their accrued charges (e.g. tuition, commons, sizings, and study rent) most often in the form of livestock, grain, fruits, vegetables, dairy products, and meats (Table 2). In addition to keeping the student credit and debit accounts, the steward procured additional food items. These may have been acquired as the college stock became low, or to provide a variation in diet (Table 3). The steward also kept a debit account for himself, which appeared to contain items that he withdrew from the college stock for his personal consumption.

In general, the foodways of the community and institution were very similar, and it may be concluded that the students' commons consisted of much the same food items that were available to the community as a whole. The infrequent appearance of fish in the inventories was paralleled in the institutional account. Only three occurrences of fish were noted: "fish 18d... fish 22d... salt fish 13s" (Colonial Society 1935: 207;227;232). The cost of the salted fish implied that this acquisition had been comparatively large, and its preserved condition further implied that this item may have been intended for long-term consumption.

TABLE 2
FOOD ITEMS CREDITED TO STUDENT ACCOUNTS

LIVESTOCK	Oatmeal
Calves	Peas
Cows	Rye
Chickens	Wheat
Ewes	Malt (barley, rye & wheat)
Fowls	Flour
Goats	Meal
Hogs	Cake (?)
Lambs	
Milk Cows	
Oxen	DAIRY
Pullets	Butter
Sheep	Cheese
Shotes	Eggs
Steers	
Turkeys	FRUITS/VEGETABLES
Turkey Hens	Apples
Weathers	Currants
	Parsnips
MEAT	Plums
Bacon	Raisins
Beef	Turnips
Fish	
Goat Mutton	SPICE
Lamb	Honey
Mutton	Pepper
Pork	Salt
Veal	Sugar
GRAIN	MISCELLANEOUS
Barley	Hot Waters
Indian	Sack
	Wine

Additional historical documentation has revealed that the students consumed mackerel on at least one occasion. Mrs. Eaton, the college cook and wife of Harvard's first administrator (1636-1639), appeared before the General Court at Boston to answer for many misdemeanors regarding the students' commons:

> and for bad fish, that they had it brought to table, I am sorry there was that cause of offence given them... and for their mackerel, brought to them with their guts in them... it is utterly unkown to me... and I humbly acknowledge my negligence (Savage 1884:358).

Mackerel were typically processed on board ship, first being split and then salted in a barrel (Colonial Society 1933:160). The process of splitting often occurred at a rapid pace, and frequently left parts of the stomach *in situ* (Unger 1980:257).

Regarding the students' diet, Morison (1936) has stated that meals (commons) were served twice daily: dinner at eleven in the morning and supper at seven-thirty at night. Bevers (sizings) were served once in the morning and once in the afternoon. Dinner may have typically consisted of bread, meat, such as veal, mutton, lamb, or pork, and beer. Supper may have included meat pie, hasty pudding or oatmeal porridge, and eggs. Morison (1936:97) noted that the steward's accounts only contained one entry of fish "which one would expect to be served on Saturday night." The entry which Morison refers to is one that had been credited to a student's account. However, he failed to take notice of the large quantity of salt fish procured by the

TABLE 3
FOOD ITEMS CREDITED TO
STEWARD'S ACCOUNT

LIVESTOCK	DAIRY
Chickens	Butter
Pigeons	Eggs
Turkeys	Milk
MEAT	**FRUITS/VEGETABLES**
Bacon	Apples
Beef	Beets
Fish	Cranberries
Salt Fish	Plums.
Lamb	
Mutton	**SPICE**
Pork	Cinnamon Cloves
Veal	Salt
Ealles (eels?)	Sugar
GRAIN	**MISCELLANEOUS**
Indian	Beer
Oatmeal	Sack
Rye	
Wheat	
Malt	
Bread	
Cake (?)	

steward, for which he was credited. It is highly unlikely that the steward had acquired such a large quantity of fish for his personal consumption, especially since its cost had been charged against the college.

The only time available for student recreation was Saturday afternoons (Morison 1936:113). One of the forms of student recreation may have been fishing, as liberty had been granted to John Glover and his friends to do so (Dunster Papers 1638-1651). Furthermore, Samuel Sewall recorded in his diary, under the date of July 3, 1674, that Nathaniel Gookin "was gone a fishing with his brothers" (Halsey 1973:5). One cannot but wonder what became of fish so acquired.

The school social code urged that students dine together at the buttery, but Graffam notes that it was "possible that students prepared meals in their dormitory, formerly a dwelling house that was equipped with a kitchen" (Graffam 1981:12). It is therefore likely that any fish procured on a Saturday afternoon may have been brought back to the dormitory and prepared for Saturday's supper.

The Olmstead-Goffe House site, 1651-1674

Archaeological excavation of the backyard portion of the Olmstead-Goffe House site, directed by Gray Graffam, resulted in the discovery of two 17th century features: a filled well and trench. These features contained a variety of architectural, ceramic, glass, metal, floral, and faunal materials. Based upon the datable items of material culture (ie. clay tobacco pipe bowls and stems, and ceramics), the material contained within the two features was given a date range of ca. 1651-1674, and "almost certainly constituted the refuse that had been discarded by the Harvard students who resided at the Olmstead-Goffe House, which had served as a college dormitory from 1651 to about 1674" (Graffam 1981:140).

Analysis of fish remains

The soils that were excavated from the well were wet-screened through one-eighth inch screening. Materials such as common pins, small bird, reptile and fish bones, fragmented fish scales, and small seeds were recovered during laboratory processing. Ten percent of the soils that were excavated from the trench were processed through a series of finely graded geologist's screens. This method resulted in the recovery of all material larger than one millimeter.

Identification of the fish remains was based upon fish scales. These materials were examined under magnification, and compared with the marginal and field characteristics that appeared on scales from known contemporary species of fish (Figures 2-7). The use of scale characters facilitated the identification process, and allowed a species identification of the archaeological materials to be rendered in some cases.

The well was found to contain 686 whole and/or fragmented fish scales. Five families of fish were identified: perch, minnow, herring, sunfish, and temperate bass. Each family was represented by one species of fish, except the temperate bass, which contained two. These species were: yellow perch, golden shiner, alewife, pumpkinseed (common sun-

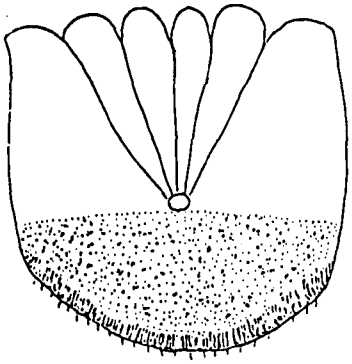

Figure 2. Yellow perch scale.

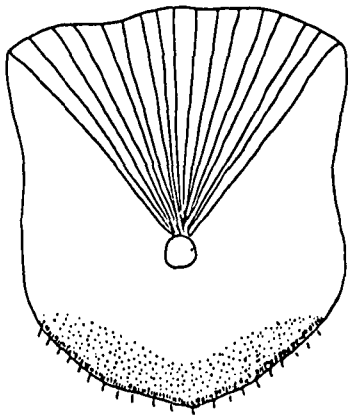

Figure 3. Striped Bass scale.

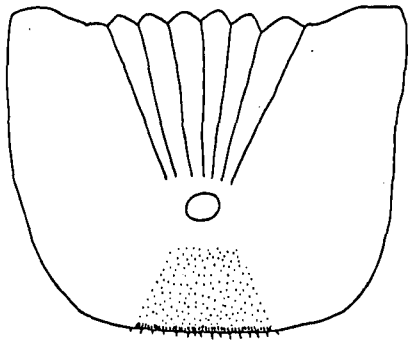

Figure 4. Pumpkinseed scale.

fish), striped bass and white perch (temperate basses).

The seventeenth-century trench contained 399 whole and/or fragmented fish scales. The same five families of fish were identified: perch, minnow, herring, sunfish, and temperate bass. Each family was represented by one species of fish. These species were: yellow perch, golden shiner, alewife, pumpkinseed, and striped bass.

A total of 1,085 fish scales were examined from both seventeenth-century features. The types of fish that were contained within these deposits were the same, except for the absence of white perch from the trench. The minimum number of individuals (Table 4) from the combined assemblages was estimated to have been six fish. This estimate was based upon a) the ratio of expected scale counts to actual counts, and b) the identical seasons of capture for all fish.

An expected scale count was based upon the estimation that each fish possessed an average of 700 scales. Six fish would produce an average total of 4,200 scales. The archaeological assemblage represented approximately 26% of the expected count. In addition, a spring season of capture was indicated by the scale margin in all instances. When the scale counts (actual) from both features were compared a diminution in the frequency was noticed. This effect is likely to occur in the event that two archaeological deposits share a common source. The division of the materials, and their subsequent relocation, may result in a high frequency of one species

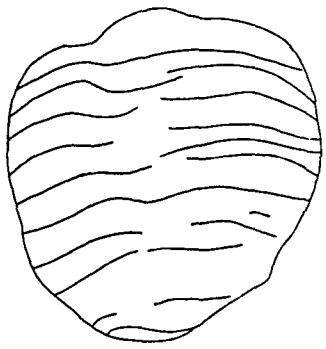

Figure 5. Alewife scale.

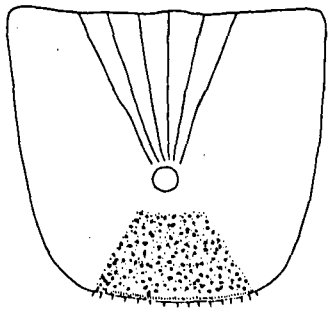

Figure 6. White perch scale.

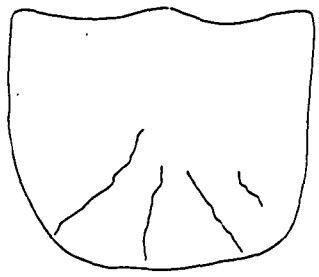

Figure 7. Golden shiner scale.

TABLE 4
MINIMUM NUMBER OF FISH WITHIN SEVENTEENTH-CENTURY CONTEXTS

FAMILY		SPECIES	
Scientific Name	Common Name	Species	Description
Centrarchidae	Sunfish	Pumpkinseed *(Lepomis Gibbosus)*	Abundant in most ponds and streams.Grows to a length of 4 to 7 inches, and weighs 6 to 8 ounces.
Clupeidae	Herring	Alewife *(Alosa pseudo-harengus)*	Ascends streams in April to spawn in fresh water ponds. Grows to a length of 15 inches, and weighs less than 1 pound.
Cyprinidae	Minnow	Golden Shiner *(Notemigonus crysoleucas)*	Abundant in ponds and streams. Grows up to a length of 12 inches.
Percichthyidae	Temperate Bass	Striped Bass *(Morone saxatilis)*	Inhabits salt, brackish and fresh water environments. Can be found at salt/fresh interfaces between April and June. At spawning, length ranges from 18 to 24 inches, and weighs from 4 to 6 pounds.
Percichthyidae	Temperate Bass	White Perch *(Morone americana)*	Present in salt and brackish streams, and fresh water ponds which are accessible to the sea. Grows from 7 to 12 inches, and weighs up to 2 pounds.
Percidae	Perch	Yellow Perch *(Perca flavescens)*	Present in most ponds and streams. Grows up to 16 inches, and weighs up to 2 pounds.

in one feature, and a low frequency of the same species in a second feature. This tendency has a higher likelihood of occurrence when species representation is small (e.g. one fish per species).

A comparison of the fish assemblages from the well and trench document a numerical inversion in scale frequency. That is, the well contained high quantities of white perch, yellow perch, and sunfish scales, whereas the trench contained low quantities of these same scales. Conversely, the well contained a low quantity of striped bass scales, while the trench contained a high quantity of these scales. However, a numerical inversion did not occur for the alewife and golden shiner. The fact that the archaeological assemblage only represented 26% of the total expected scale count indicated that a large percentage of these materials, contained in their original context, may not have been redeposited within these two features.

A relationship between the two deposits was firmly established by the homogeneity of fish scales, the identical seasons of capture, and the numerical inversion in scale frequency (in four instances). The inversion further supported the hypothesis that only six fish had been contained within both deposits, and that the two features had shared a common source of origin.

Although the division and redeposition of these materials undoubtedly caused a mixture of materials, they had not been heavily mixed. The analysis of the scale distribution within the well approximated a bell curve

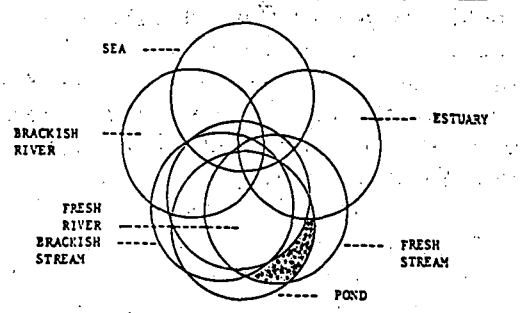

Figure 8. Environmental syllogism: yellow perch, pumpkinseed, and golden shiner.

(51% at the ten to thirteen foot level), and documented that minimal disturbance occurred when the soils were redeposited within the two seventeenth-century features. Further evidence of minimal disturbance was manifested in the trench, in which the scales were found to cluster at the 35-40 centimeter level (77%).

The majority of the fish identified from the two deposits were not commercially marketable. Rather, they would have been almost certainly acquired by angling. The spatial and temporal variables were charted for each species' envinronment (Figures 8-11). Although a maximum of seven ecosystems may have been exploited, it was likely that far less than that had been selected. A locational overlap for the six species of fish indicated that, during the spring months only, each species could have been procured in fresh water streams (Figure 12). As previously stated, the examination of the fish scale margins documented that these fish had been caught during the spring. It is therefore likely that a nearby stream had been the source of the fishing activity. In addition, the exclusive spring season of capture of such a small quantity of fish implied that they may have been caught during one afternoon and prepared for that evening's meal.

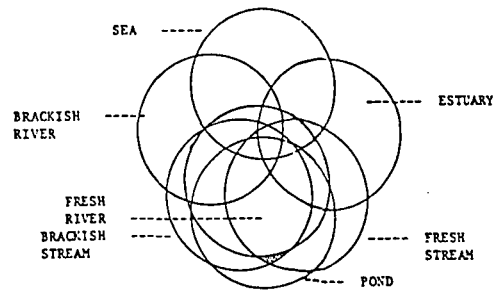

Figure 9. Environmental syllogism: white perch.

Conclusion

Graffam's analysis shows that both assemblages contained similar materials, and that some of the ceramic sherds crossmended with fragments from the other assemblage. He has concluded that the "dietary refuse and the discarded artifacts within the assemblage" documented that the students "procured, prepared, and consumed various meats" and were "independently engaged in foodways" (Graffam 1981:143).

The analysis of the fish remains established that the two archaeological features had contained similar redeposited materials, and that they were related in their origins. The analysis of fish scale distribution further established that these materials had not been extensively mixed during their redeposition. The minimum number of individuals was determined to have been six fish. This figure was reliably supported by the numerical inversion in scale frequency, and the identical seasons of capture for all fish. The nonmarketability of these species of fish indicated that they had been acquired by angling, rather than through market exchange. These fish had been caught and, presumably, consumed during the spring. The spring capture indicated that a local fresh water source, perhaps a stream, had been selected for fishing activities.

The analysis of the archaeological fish remains has documented that the students of Goffe College spent some of their leisure time fishing, and that their catch had been prepared and consumed in the dormitory. These may have been roasted, broiled or stewed, and garnished according to taste. The fish refuse had then been discarded into the backyard area of the structure and, at a later date, mixed with the building's demolition debris.

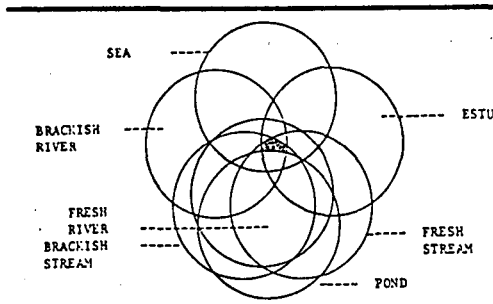

Figure 10. Environmental syllogism: striped bass.

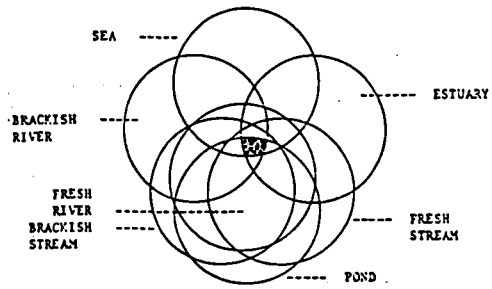

Figure 11. Environmental syllogism: alewife.

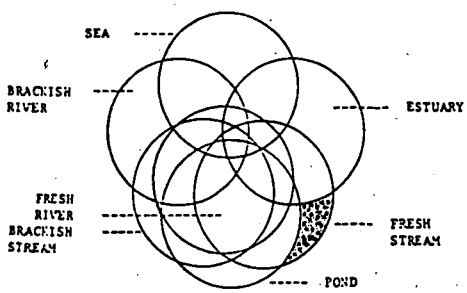

Figure 12. Environmental syllogism: locational interface.

These materials were then utilized to fill in a well and a trench.

In conclusion, the absence of an extensive variety of fish (marine and fresh water) indicated that the assemblage of fish remains was not related to a household trash disposal pattern. The obvious lack in quantity of fish indicated that the assemblage did not fit the community trash disposal pattern, and the lack of marine fish (mackerel) further excluded the probability of an institutional trash disposal pattern. The array of fresh water and anadromous fish, the absence of marine species, and the small quantity of fish, collectively, indicated a disposal pattern distinct from those above. It is concluded that these fish constituted one portion of the students' supplemental diet, thereby providing additional data with regard to the activities and foodways of Harvard students during the third quarter of the seventeenth century, for which historical documentation is scant. The analysis of fish remains has thus not only enhanced the overall interpretation of seventeenth-century student foodways, but independently supported the conclusions drawn by Graffam.

ACKNOWLEDGEMENTS

I wish to thank Gray Graffam for providing the archaeological data necessary for this research. I also thank Suzanne Spencer-Wood for her constructive criticism and guidance throughout the course of my graduate studies.

REFERENCES

Anderson, Jay
1971 A Solid Sufficiency:An Ethnography of Yeoman Foodways in Stuart England. Ph.D. dissertation, University of Pennsylvania.

Bowen, Joanne
1978 Probate Inventories: An Evaluation from the Perspective of Zooarchaeology and Agricultural History at Mott Farm. *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*, Robert L. Schuyler, editor; 149-159. Baywood Publishing Co., Inc. New York.

Colonial Society of Massachusetts
1935 Harvard College Records: Chesholme's Steward's Book 1651-1660. Part 3 Vol. XXXI. Colonial Society of Massachusetts Publications. Boston.

1933 Records of the Suffolk County Courthouse. Colonial Society of Massachusetts Publications. Boston.

Graffam, Gray C.
1982 The Foodways of Harvard Students, 1651-1674: The Archaeological Evidence. M.A. Thesis on file Cooperstown Graduate Program. Cooperstown, New York.

1981 Redline Extension Northwest: Final Report Phase III Excavation of the Olmstead-Goffe House Site, ca. 1632-1674. Institute for Conservation Archaeology, Peabody Museum, Harvard University. Cambridge, Massachusetts.

McMahon, Sarah F.
1980 Provisions Laid Up for the Family: Toward a History of Diet in New England, 1650-1850. Paper Presented at the Workshop in Economic History, Harvard University.

Morison, Samuel Eliot
1936 *Harvard College in the Seventeenth Century.* Harvard University Press. Cambridge, Massachusetts.

Rothenberg, Winifred B.
1980 The Marketing Perimeters of Massachusetts Farmers 1750-1855. Paper Presented at the Workshop in Economic History, Harvard University.

Savage, James
1884 *Boston Events: A Brief Mention* of the Date of More than 5000 Events . . . 1630-1880. Tolman and White Printers. Boston.

Singer, David A.
1980 An Index to Seventeenth-Century Massachusetts Probate Inventories: Middlesex County 1648-1699. Typescript.
1982 Ichthyofauna as an Interpretive Tool in Historic Sites Archaeology. M.A. Thesis on file, University of Massachusetts, History and Historical Archaeology Program, Boston, MA.

Thomas, M. Halsey (ed.)
1973 *Diary of Samuel Sewall 1674-1729.* New York, Farrar, Straus and Giroux, 2 vols.

Unger, Richard W.
1980 Dutch Herring, Technology, and International Trade in the Seventeenth Century. *Journal of Economic History;* 40(2):253-279.

Author:

DAVID SINGER
37 Union Street
Cambridge, Massachusetts 02139