Charcoal, Isotopes, and Shell Hoes

Reconstructing a 12th Century Native American Garden

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Corn-based agriculture was established among the Fort Ancient Indians in the central Ohio River valley by the 11th century A.D. Beginning in 1978, the Dayton Museum of Natural History set out to reconstruct the sort of garden the Fort Ancient Indians would have grown at SunWatch Village, an A.D. 1180 stockaded settlement located in what is now Dayton, Ohio (see box on the excavations). Charred plant remains, gardening and food production artifacts and features, and the results of human bone studies from this site, combined with similar information from nearly 50 other Fort Ancient sites, have provided direct and indirect archaeological evidence for what was grown.

The goal of our efforts is not so much to replicate Fort Ancient gardening practices as it is to re-create the plants themselves (Fig. 1). The gardening techniques we follow are derived from historic accounts and descriptions of fields and gardening. The types of crops we grow are based on archaeological evidence, and our program of breeding is guided by comparison between the modern varieties and the archaeological evidence.

1
Corridor of squash and gourd plants in the re-created garden at SunWatch Village.

Life in the 12th Century

The Fort Ancient Indians, whose culture flourished from A.D. 950 to 1650, established permanent villages along the Ohio River drainage system in what is now central and southern Ohio, northeastern Kentucky, southeastern Indiana, and western West Virginia (Fig. 4). Their villages typically were arranged in an orderly fashion, with the cemetery, houses, and underground food storage pits laid out around a central public plaza. A stockade or fence often surrounded the village, which was home to several hundred inhabitants. The villages appear to have been independent and self-supporting, unlike the settlements of contemporary Mississippian groups to the west which were unified into regional networks under an overarching political authority.

Even though the Fort Ancient people relied heavily upon a few food plants and meat animals, they supplemented and spiced their diet with a wide variety of less important foods (Shane 1988). White-tailed deer and elk frequently accounted for over 85 percent of the meat in their diet, with the remaining 15 percent supplied by black bear, raccoon, turkey, squirrel, turtle, fish, and other animals.

Fort Ancient farmers raised corn, beans, pepo squash, gourds, sunflower, tobacco, and chenopod (goosefoot), but they also gathered a variety of wild nuts, fruits, greens, small-seeded annuals, and roots. Corn (*Zea mays*) was an important component in the Fort Ancient diet: actual corn remains are ubiquitous and often abundant at Fort Ancient villages, and associated small seed assemblages indicate the high degree of vegetational disturbance associated with agricultural fields. By way of comparison, corn is absent or infrequent at preceding early Late Woodland (A.D. 600 - 750) sites in the same area, and the associated weed assemblages are smaller and

2
SunWatch Village, named in honor of the inhabitants and some of their activities, is now partially reconstructed and open to the public. All structures have been placed in their original positions, using the postholes excavated by the archaeologists. A variety of clues led to the determination of how the superstructures looked.

Excavations at SunWatch Village

Sunwatch Village (originally named the Incinerator Site for a nearby landmark) was brought to the attention of James M. Heilman, Curator of Anthropology at the Dayton Museum of Natural History, by John C. Allman. Allman, a local amateur archaeologist, urged that something be done about this nearly undisturbed single component Fort Ancient site. Other Fort Ancient sites had been excavated as early as the 1890s, but this was one of only a very few that did not contain a bewildering sequence of multiple occupations, nor had it yet been encompassed and destroyed by urban sprawl. Destruction, however, was imminent due to plans to expand a nearby sewage treatment plant. Already a road ran through the east side of the site. Excavation and subsequent reconstruction of the site were carried out by the Dayton Museum under Heilman's direction.

The artifacts that had been brought to the surface by plowing were limited to a roughly circular area, leading Heilman to surmise they delineated a stockaded village. Salvage excavations (1971-1975) confirmed that this was, indeed, a stockaded village with only a single occupation period of approximately 40 years or less. Better yet, the preservation of fragile remains was phenomenal for an open site that had been exposed to 800 years of rain, freezing temperatures, and other natural destructive forces. The excavators were able to recover delicate artifacts such as infant bones, crawdad pincers, fish scales, turkey eggshells, and bits of uncarbonized (but collapsed) wood. The site was placed on the National Register of Historic Places, and with the cooperation of the City of Dayton and the sewage treatment plant, plans for destruction were discontinued.

less indicative of large, open fields. The switch to dependence on corn occurred between A.D. 750 and 950, a period for which we lack excavated sites in this region.

SunWatch Village

SunWatch Village occupies a low terrace in the floodplain about 200 m west of the present course of the Great Miami River, at the southern edge of the city of Dayton. The site itself is on a pocket of Wea silt loam, a highly productive, well-drained neutral soil with a deep root zone that is typical of prairies. The site is underlain by glacial sands and gravels that provided good drainage for the underground food storage pits dug by the villagers.

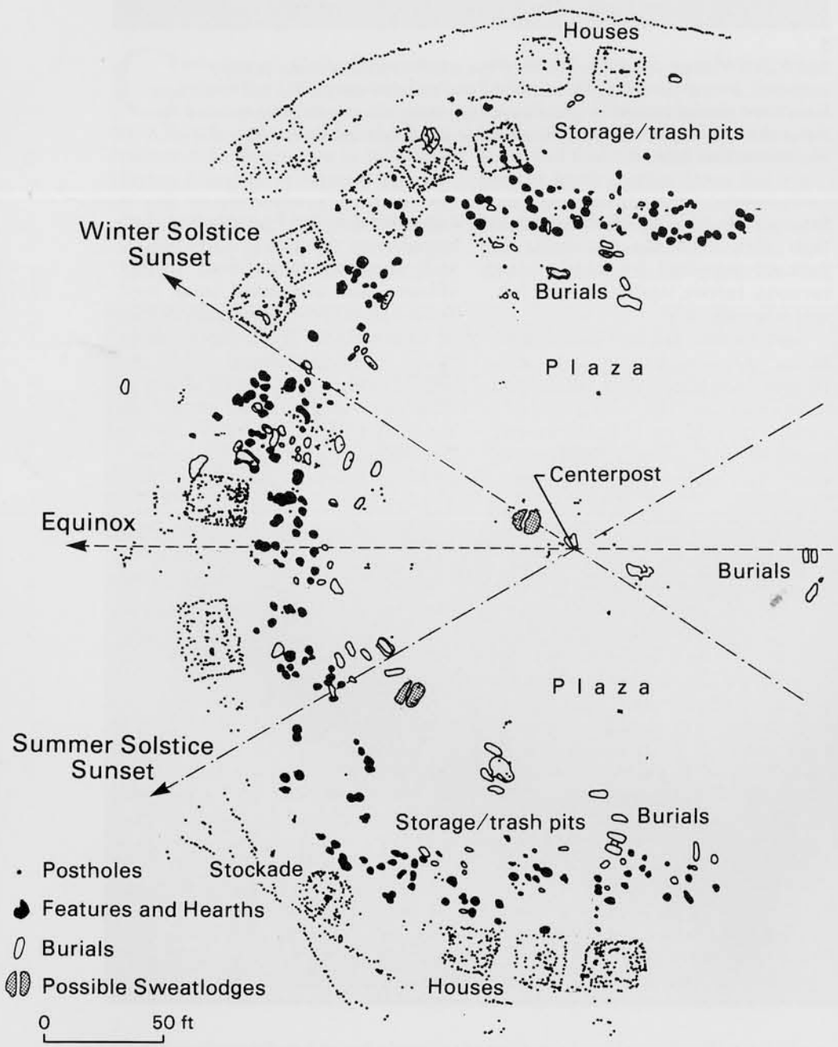
The stockade bounding SunWatch Village enclosed an oval area approximately 128 m north-south and slightly less east-west. Inside, the village was arranged in a series of recognizable zones around a cleared public plaza (Fig. 3). The zones included an outer residential area marked by a single or sometimes double row of houses, each with a central hearth; a band of underground storage pits that were secondarily used for trash disposal; and the village cemetery. In the center of the plaza was a large pole made of eastern red cedar and flanked by four smaller poles that had been carefully spaced to form a parallelogram.

Although the most obvious pattern at the village is the concentric arrangement of residential/work, mortuary, and public zones, Heilman proposes that further village divisions were roughly marked by astronomical alignments from the central pole (Heilman and Hoefer 1980). The solstice sunset lines divide the extant village into three radial sectors: two residential areas, one to the north and one to the south, and a public/ceremonial area to the west. A fourth sector to the east has been destroyed by road building.

The western sector is marked as the ceremonial and social center of the village by the large size and unusual content of the structures, the number and spacing of high-status burials, and by the number of exotic (non-local) and unusual goods recovered from the western trash pits. A great deal of secondary lithic reduction (the final stages in tool or arrowhead making) took place in and around one of the west-side structures (Robertson 1984).

Other social divisions within the village are evident: household burial plots can be delineated based on the distribution of congenital skeletal anomalies and pathologies (Robbins 1976), and differences among ceramic vessels and their disposal point to a possible matrifocal residence pattern (Heilman 1988).

Due to its short period of use before abandonment, SunWatch village essentially constitutes an archaeological snapshot in time. Even before the site was nominated to the National Register of Historic Places,



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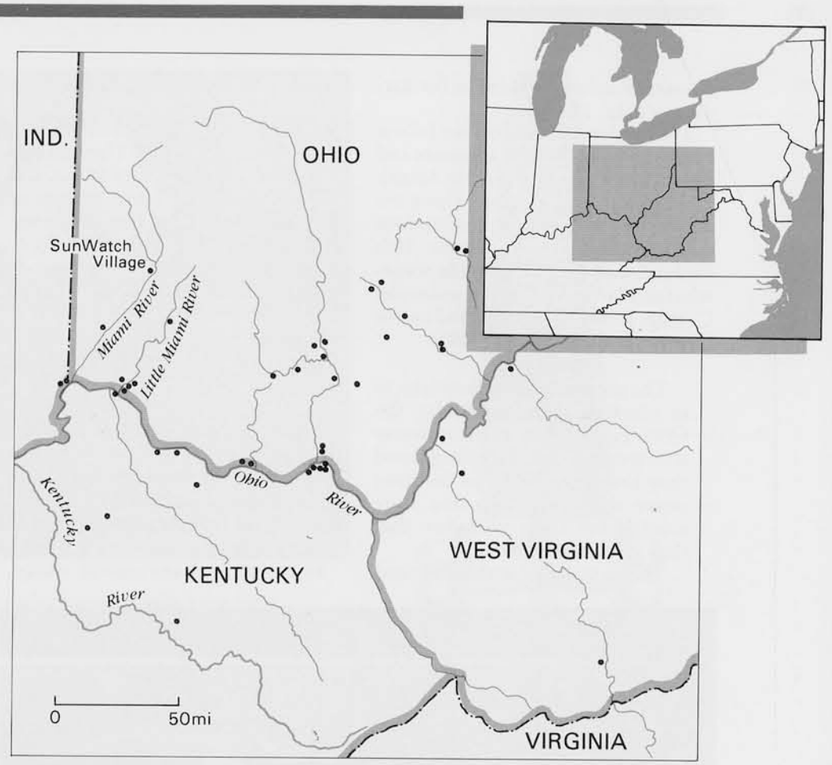
Plan of the excavated portions of SunWatch Village. Note how the cemetery, underground storage/trash pits, and rectangular structures form zones that ring the central plaza. The stockade along the south edge was rebuilt at least once during occupation of the village. The solstice sunset lines through the center pole frame the western ceremonial side of the village.

James M. Heilman (Curator of Anthropology) conceived of reconstructing the village and opening it to the public (Fig. 2). My imagination was kindled with the idea of recreating, as accurately as possible, the type of garden that would have been grown by the original inhabitants of the village. I wanted to breed plants that *looked* the same as those from 800 years ago. In 1978, a high school student named Anthony Conard enthusiastically agreed to plant the garden if I would obtain the seed. We are still growing and perfecting the garden.

Breeding the Plants

The breeding program has been centered around corn. In 1978, we grew commercially available varieties, but by 1979, I had obtained Northern Flint corn from corn breeders and Indian contacts (see box on domesticates). In the initial years of our garden, we grew out and hand pollinated a number of types of Northern Flint, along with a few other races of corn (Fig. 5). The purpose was to make metric comparisons of cobs and kernels between the modern types and the archaeological Fort Ancient corn. It also was to find which types are best suited to growing conditions in the Miami Valley. The hand pollination was necessary to keep the separate types pure, or to make deliberate crosses. In 1981, a grant from a local garden club made possible the purchase of a small freezer to use for a permanent seed bank. Seed from the garden is dried, sealed in glass jars, and frozen to retain optimum long-term viability.

The goal is to breed selectively for those morphological cob and kernel characteristics that most closely mimic the archaeological specimens. In actuality, most of our efforts have worked toward increasing our seed supply. Good intentions exceed available time for measuring, then burning and re-measuring the modern crops. Nevertheless, some comparative data have accumulated. Luckily, the morphologically uniform Fort Ancient corn undoubtedly became the morphologically distinct race,



4
Map showing distribution of Fort Ancient sites with reports of plant remains.

Northern Flint. No matter what type of Northern Flint we grow, we at least have the correct ancestral race.

The squash we grow is a thick-shelled variety developed by John White (Illinois) to replicate early Mandan-type strains. Like the early squashes found archaeologically, it can be hollowed out and used as a container. Fort Ancient may mark the period when thinner-skinned "summer" squashes first became common crops, based on the negative evidence that few squash rinds are recovered from Fort Ancient sites. The drop in charred squash rinds at Fort Ancient sites may just as reasonably be related to the methods of preparation, including the use or not of fire. At Middle and Late Woodland sites, rinds often are ubiquitous and abundant. Historic accounts describe a wide variety of squash forms, and comparable variety probably was present among the Fort Ancient squashes.

The beans we have grown, while replicating the length to width ratio of the Fort Ancient beans, have not been as small as the archaeological beans. Although we have not deliberately bred our sunflowers, we have selected for multiple-headed plants with achenes (as sunflower seeds are called) of a solid purple-black color. This color first appeared as a sport in the 1979 crop; the polycephalic trait may be attributed to natural outcrossing with local wild populations.

Re-creating a Garden

No actual Fort Ancient garden plot has ever been identified or excavated, so the design or layout of the fields is unknown. The ubiquity of weed seeds such as sumac, purslane, and nightshade at Fort Ancient sites leads to speculation that gardeners selectively allowed certain weeds to grow along with the deliberately planted domesticates. An abundance of freshwater mussels that had been hafted and used as hoes

constitute indirect evidence for gardening (Fig. 10).

The gardening practices we follow are taken from historic accounts and descriptions of other Native American fields and gardening. There are a number of excellent descriptions dating from as early as the 16th century, and they all provide somewhat similar accounts. For example, Captain John Smith described native farming practices of 1607-1609:

> The greatest labour they take, is in planting their corne, for the Country naturally is overgrowne with wood. To prepare the ground they bruise the barke of the trees neare the root, then doe they scortch the roots with fire that they grow no more.
>
> The next yeare with a crooked peece of wood they beat up the weeds by the rootes, and in that mould they plant their Corne. Their manner is this. They make a hole in the earth with a sticke, and into it they put foure graines of wheate [corn] and two of beanes. These holes they make foure foote one from another; Their women and children do continually keepe it with weeding, and when it is growne middle high, they hill it about like a hop-yard. (Arber and Bradley 1910:357-358)

Two of the most detailed accounts are from the early 20th century: one by Arthur Parker (1910) on the Iroquois, and one recorded by Gilbert Wilson (1917) from the Hidatsa in North Dakota.

In strict archaeological usage, these are far-fetched analogies to be making: one would prefer an historic account on the Fort Ancient Indians, but there are none. Only recently have some of the northern Kentucky Fort Ancient sites been definitely linked with the historic Shawnee, and we have no accounts of Shawnee gardening in this area. Because all of the historic accounts from eastern North America describe similar horticultural practices, we simply chose the most detailed (and delightful) account to use as our model for the SunWatch Village replicated garden.

We plant our garden plots in the pattern described by Buffalobird-woman for the Hidatsa Indians (Wilson 1917). All of the corn, beans, squash, gourds, and sunflowers are grown in hills in a square to rectangular plot. The sunflowers are spaced approximately six feet apart around the border of the plot. Wide corridors of squash and gourds (see Fig. 1) separate areas of corn and beans. We have spaced corn hills four feet apart, with bean hills placed between them. We have also planted beans directly in the corn hills. So far, we have simply allowed local modern species of chenopod to grow as tolerated weeds, but we are starting to introduce seed of the most probable species, *Chenopodium bushianum* (alternately called *C. berlandieri*).

"The gardening practices we follow are taken from historic accounts of other Native American fields and gardening."

The tobacco is started in a small, separate seed bed, then transplanted to a tobacco plot separate from the rest of the garden (Fig. 11). Among the Hidatsa, the women tended the corn/bean plots, and men tended the tobacco plots. We have no such detailed information for the Fort Ancient Indians.

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Corn is hand pollinated to maintain purity. The selected pollen is sprinkled onto the silks, and the ear is bagged until mature to protect it from unwanted pollen.
Photo by Bill Patterson, Sr., of Patterson Graphics, Dayton, OH

6
Pepo squash fruit and male flower. These male flowers, which open for a single day and produce no fruit, were picked and eaten fresh or spread like shingles to dry into a thin, storable sheet for later use in soups or snacks.

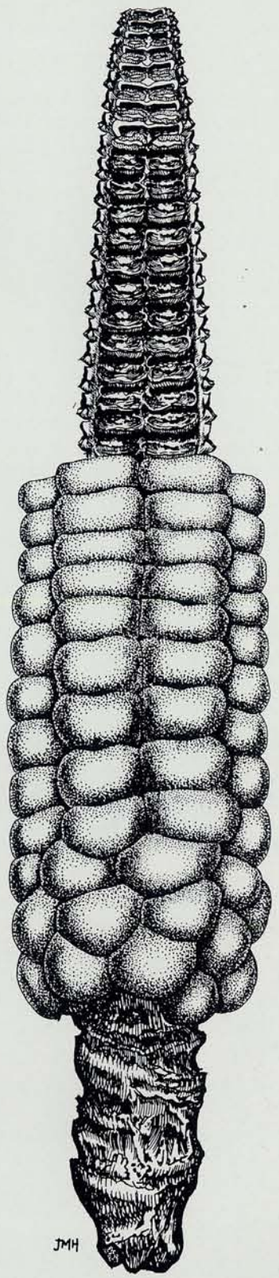
We are learning that scheduling can be important in the success of a crop. Sunflower is planted in early May. We begin to plant corn the second week in May: some of the varieties we breed do best when planted early (the northeastern Northern Flints), whereas others need the warmer soil temperatures of the first week in June (the plains Northern Flints). Following the Hidatsa schedule, we plant beans the second week in June (they require a warm soil for successful germination). Pre-sprouted squash and gourd seeds are planted in late May to early June. The tobacco can be planted outdoors in early May. Our chenopod, which is wild rather than domesticated, germinates best if it is allowed to seed naturally in the fall.

The likelihood of corn crop success is related to the different kernel types within the Northern Flints: the flint corns will almost always produce a good crop under the present growing conditions, but the flour corn crop may be drastically reduced by smut during the growing season and mold at the time of harvest. Smut is now endemic to the Ohio Valley. Slight shifts in the timing rather than the amount of rainfall may mean the difference between a good and a bad crop. Late summer/early autumn rainfall, such as we often have now, may result in the failure of the flour corn crop. Given the historic preference for the ease of preparation and taste of flour corn, the SunWatch villagers probably grew both flour and flint corn, hoping for a crop from the flour, but depending on a crop from the flint. So far, we have not identified whether the charred archaeological kernels are flour or flint, but we may be able to do so with the help of the scanning electron microscope.

Reaping the Harvest

One of the joys in growing an Indian garden has been experimenting with historic Indian recipes. Buffalobird-woman used white flint corn in the following recipe for *mapi-nakapa*:

> I put water in a pot, and in this I dropped a section of a string of dried squash, with some beans. Dried squash was always strung on long grass strings; and having,



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A reconstructed Fort Ancient corn cob with the kernels removed from the upper half to show the underlying structure of the cob. Note the thick, sturdy shank or stalk, and the extra kernels at the base of the ear.

Evidence for Domesticates

The direct evidence for domesticates at SunWatch and the other Fort Ancient sites is in the form of charred plant remains. Uncharred remains rarely survive at an open site that has been exposed to rain, frost, and other destructive processes. Charcoal is relatively inert and will preserve well so long as it is not mechanically abraded.

Plant remains that have been preserved through charring can retain their shape and distinctive cell structures, although there may be some distortion. Species and sometimes even races or varieties may be identifiable. Few experiments have been published on measuring the effects of charring different plant parts, but corn cobs are known to shrink, corn kernels may expand, and beans may either shrink or expand. These distortions must be taken into account when trying to reconstruct the actual appearance of the original specimens.

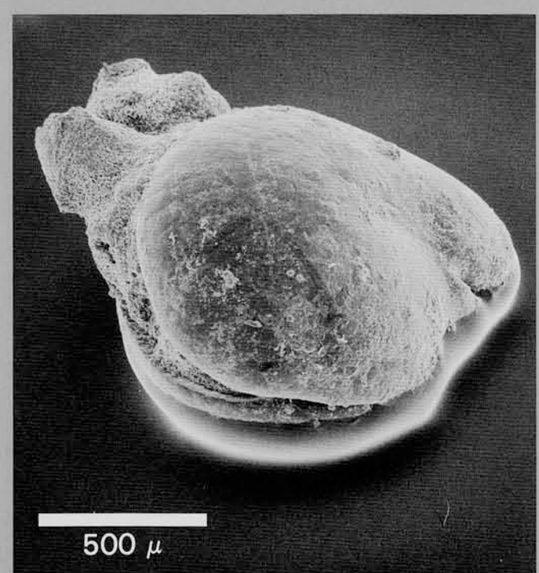
The domesticates recovered at SunWatch Village include corn (*Zea mays*), beans (*Phaseolus vulgaris*), squash (*Cucurbita pepo*), sunflower (*Helianthus annuus*), chenopod (*Chenopodium* sp.), and tobacco (*Nicotiana* sp.). Bottle gourd (*Lagenaria siceraria*), another domesticate, has been recovered from other Fort Ancient sites. Maygrass (*Phalaris caroliniana*), erect knotweed (*Polygonum erectum*), and marsh elder (*Iva annua*), which were cultivated by the Late Woodland inhabitants of the central Ohio valley, appear to have been dropped from the repertoire of the Fort Ancient farmers.

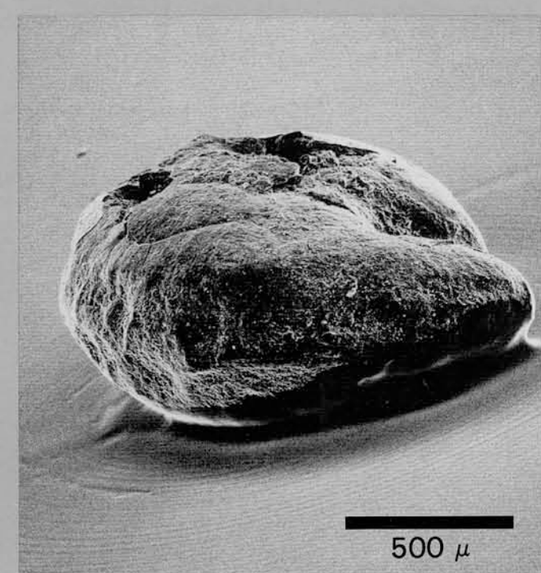
Corn

With the help of a number of observations and measurements, even individual corn kernels or fragments of cobs may be identified to race. Although no one kernel or cob character can consistently distinguish one race from another, some—such as cob row number and shape—may be highly diagnostic. Nearly forty years ago, Nickerson undertook a study to determine which cob characters best differentiate one race of corn from another (1953). Luckily, many of those characters are observable on fragmented, charred archaeological specimens.

The corn from Fort Ancient sites is quite homogeneous and appears morphologically similar to a distinctive historic eastern North American land race called Northern Flint. Historic and modern Northern Flint corn encompass both flint and flour kernels, as well as a variety of kernel colors. Although few farmers continue to grow Northern Flint today, it remains a major source of germ plasm for the commercially important midwestern dent corns.

Measurements taken on 326 cobs coupled with observations on 1,342 cobs from 18 Fort Ancient sites allow the reconstruction of a typical Fort Ancient ear of corn (Fig. 7). Like its descendant, Northern Flint, the Fort Ancient corn population typically contained 85 to 90 percent 8-row cobs, 10 to 15 percent 10-row cobs, and 5 percent or less 12-row cobs. After correcting for shrinkage due to carbonization, the cobs measure 8.0 to 12.6 cm in length and from 1.3 to 1.6 cm in diameter at the midpoint of the cob. The cob tapers toward the tip from a large, sturdy shank and slightly enlarged butt, and





8a,b
Scanning electron microscope pictures of charred wild (a) and domesticated (b) type chenopod fruits from SunWatch Village. The thick coat of the wild type is visible at the bottom left, below the extruded endosperm. The thin coat of the domesticated type can be seen in the upper center of the fruit. Note the biconvex (wild) versus the truncate (domesticated) margin shapes.

the kernels accordingly are graded in size from larger to smaller. Overall cupule width averages 11.0 mm and kernel thickness averages 4.6 mm, forming a shallow, broad, but fairly open cupule. The kernels of Fort Ancient corn are thick, rounded, and broader in width than in depth. For the most part, they are flour and flint, although a few probable popcorn cobs have been recovered. The 8-row kernels average 11.4 mm in width and 8.6 mm in depth.

Beans

Modern varieties of beans can be distinguished by two characters, seed shape and size, that are present in archaeological specimens and by one character, seed color, that is no longer observable after charring. All of the Fort Ancient beans belong to the genus and species *Phaseolus vulgaris*, which has hundreds of historic and modern varieties (for example, kidney, navy, great northern, pinto). Without the character of color, it is so far not possible to define the exact variety of the archaeological specimens. During carbonization, even though the bean may either expand or shrink, the shape of the bean remains recognizable, and the ratio of length to width remains virtually the same.

The majority of Fort Ancient beans are entire (oblong) to reniform (kidney-shaped) in form, with rounded to somewhat pointed (sometimes truncate) ends, a flat rather than a plump cross section, and a length-to-width ratio of 1.7 to 1.9. This shape is very similar to a number of named historic and modern varieties, such as Genuine Cornfield and Arikara Yellow, but the size (after accounting for charring) is smaller than the modern or historic specimens. There is some evidence for a second variety, one that is plumper and more rounded, with a length-to-width ratio of 1.2 to 1.4.

Squash

Squash remains, which are common at preceding Late Woodland sites in the same area, are found infrequently at Fort Ancient sites. Only charred rind fragments have been recovered from SunWatch Village (Fig. 9), but both rinds and occasional seeds have been recovered from other Fort Ancient sites. All of the squash belong to the polymorphic genus and species *Cucurbita pepo*, which today includes summer squash, true pumpkins, and ornamental gourds (for example, acorn squash, Connecticut Field pumpkin, scallops, zucchini, and crooknecks). It is not possible to define the archaeological varieties, although the preserved rind fragments tend to be from the thick- rather than thin-skinned varieties. The measured charred rind fragments from SunWatch Village are 1.9 and 2.2 mm in thickness. Likewise, the gourd fragments that have been recovered are not complete enough to reconstruct the prevalent or preferred shapes grown by the Fort Ancient Indians.

Sunflower

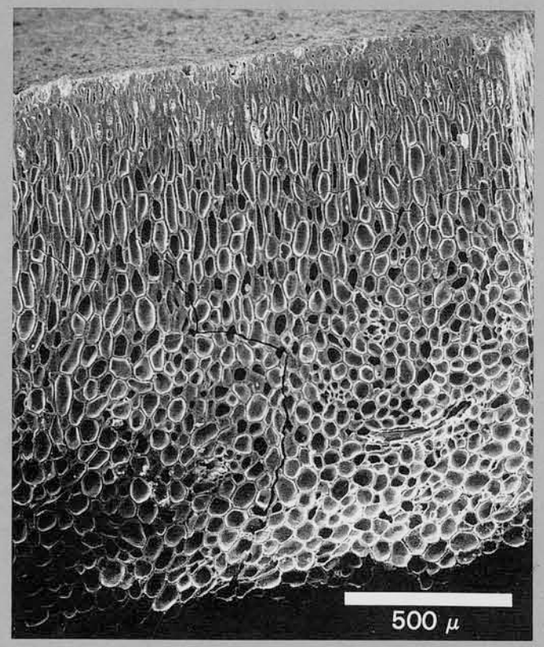
All of the sunflower achenes recovered from Fort Ancient sites are fully domesticated, based on a comparison through time of achene size index (length to width). Approximately 10,472 sunflower kernels and achenes, charred but still visibly striped, were recovered from the Cramer site. So far, only one achene has been identified from SunWatch Village.

Tobacco

Tobacco has been recovered from four Fort Ancient sites. Although comparative morphological studies are yet incomplete, the species is thought to be *Nicotiana rustica*, the species first encountered historically in the eastern United States. The tiny seeds, which are the size of a period at the end of a sentence, can only be recovered through flotation. This is a technique in which dirt from an archaeological context is dumped into a screen-bottomed container immersed in a body of liquid (usually water). Objects that are small and light, such as seeds, float to the surface and can be separated without harm from the dirt matrix.

Chenopods (Goosefoot)

Based on fruit morphology, both wild and domesticated types of chenopods have been recovered by flotation from SunWatch Village. Chenopod, perhaps better known as goosefoot, is no longer cultivated in North America. The closest probable living relative to this archaeological material is *Chenopodium berlandieri* ssp. *nuttalliae*, of which three domesticated varieties are still grown today in Mexico for both the nutritious greens (*huauzontle* and *quelite*) and the grain-like fruits (*chia*). The wild chenopod fruit has a thick coat with a biconvex shape, whereas domesticated chenopod fruit has truncate margins and a very thin coat (Fig. 8a,b).



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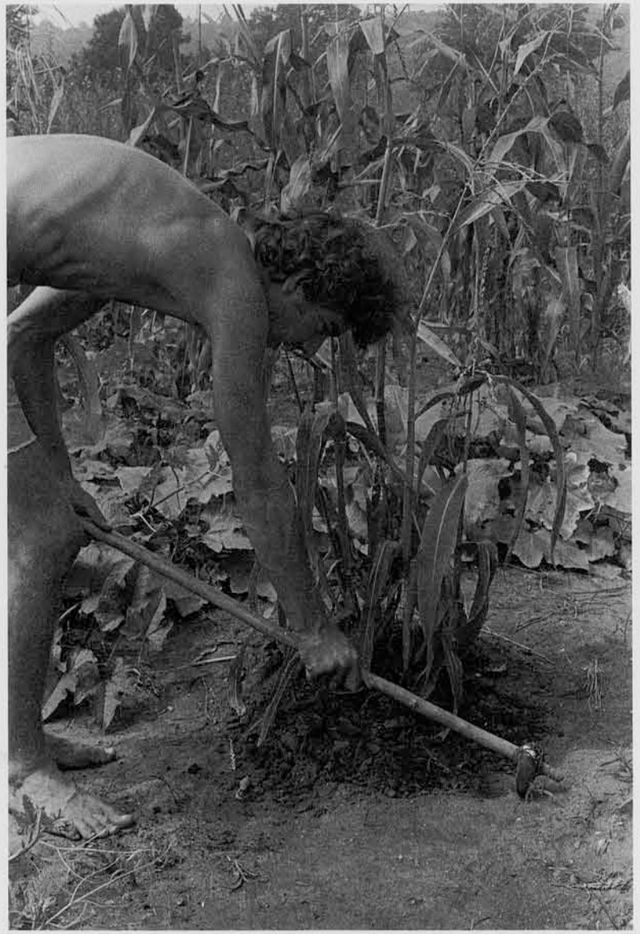
*Scanning electron microscope picture of charred squash rind from SunWatch Village. The distinctive cell structure can identify it to genus (*Cucurbita*) but not to species; seeds and peduncles (stalks) can complete the identification.*



10a,b
(a) Hilling corn with a replicated shell hoe. The patterns of wear and breakage that result from use compare well with the archaeological specimens. (b) Closeup of a replicated shell hoe. The hole for the haft was made by pecking with a stone. The shell must be fresh, not weathered.

from one of these strings, cut off a piece I tied the ends together, making a wreath, or ring, four or five inches in diameter. It was this ring of dried squash slices that I dropped into the pot. When well boiled, I lifted the squash slices out by the string and dropped them into a wooden bowl, where I mashed them and chopped them fine with a horn spoon. The mashed squash I dropped back into the kettle again, with the beans; the now empty string I threw away. Meanwhile corn had been parched, and some buffalo fats had been held over the coals on a stick, to roast. The parched corn and roast fats I pounded together in the corn mortar; and the pounded mass I stirred into the kettle. The mess was now ready to be eaten. (Wilson 1917:60)

Recipes can be based on fresh foods, dried foods, or a combination of the two. For example, green corn could be boiled or roasted; it could be shelled and boiled to make mush; shelled, pounded, and baked to make bread; or half-boiled on the cob, dried, shelled, and dried for storage.

What was the mix of these plant foods in the Fort Ancient diet? The charred botanical remains do not directly reflect the diet, since not all plant parts char and preserve equally well, nor are they all discarded in the village or exposed to fire. Analysis of the trash from pits filled in the summer versus the winter months reveals no significant seasonal differences in the types of plant food remains that were discarded (Wagner 1987). Likewise, Fort Ancient skeletal populations do not reflect episodic fluctuations in health stress.

On the other hand, the skeletal remains do reflect the detrimental effects of a dietary dependence on corn. The Fort Ancient populations have high rates of dental caries, as well as other bone pathologies. Heavy carbon isotope analysis of the bone collagen can roughly indicate the amount of corn in the diet. This is because corn, like a number of other plants that originated in hot, dry areas, carries a particular isotopic signature that is passed on to the

organisms that eat it. The Fort Ancient Indians were eating a lot of corn.

We have tried to replicate some of the gardening and storage techniques at SunWatch Village, including making and using shell hoes and wooden digging sticks, building and using drying racks, and digging storage pits. Some of these activities are based on archaeological evidence, some on historic descriptions.

How closely should one follow the gardening practices of the time when attempting to present a reconstructed garden to the public? A number of fast-growing, non-native weeds common today were unknown to the Fort Ancient Indians. The burning off of a field today may trigger an explosion of the (foreign) thistle population. In the face of this, the use of digging sticks and shell hoes, while picturesque, is labor intensive. Likewise, new diseases and insect pests have been introduced into the area, forcing the modern gardener to take measures that were unnecessary in the Fort Ancient fields. Today we find it difficult to collect the same species of river mussels that were favored for hoes by the Fort Ancient Indians; other, more pollution-tolerant species now dominate the rivers. Such concerns emphasize the fact that present conditions are not the same, and thus can provide only rough analogs for interpreting past behaviors.

There is real value to both the participating archaeologist and the observing public in continuing to replicate, as faithfully as possible, past gardens such as these. The archaeologist views such experimentation as a laboratory for more closely examining past behaviors. The public gains an opportunity to observe and experience certain aspects of past lifeways in a way that encourages imaginative understanding. Besides, it's fun!

11
*A small tobacco plant (*Nicotiana rustica*). Wilson's account (1917) describes how the flowers were preferred over the leaves for smoking.*

Saving Our Heritage

Can we still grow the tasty tomatoes, beans, apples, and other garden produce our grandparents had? The answer is yes, but only with your participation. If you are interested in maintaining rare or heritage varieties of food crops, or are concerned about the loss of genetic diversity, you can join the growing network of gardeners and plant collectors in the Seed Savers Exchange. This grassroots organization connects growers and seeds, maintains a Heritage Farm, and publishes seed-saving information. To obtain a 4-page color brochure that describes their projects and publications, send $1.00 and your name and address to: Seed Savers Exchange, R.R. 3, Box 239, Decorah, IA 52101.

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Acknowledgments

Through the years, volunteers have contributed innumerable hours to the success of the SunWatch Village gardens. The author would like to especially thank Anthony Conard, William Mooney, The Four Season's Garden Club, E.J. Koestner, and James M. Heilman. Seed was obtained from Don Duvick, Pioneer Hi-Bred International; R.J. Lambert, University of Illinois; and John White, Ancient Lifeways Institute, Illinois. Support for this project was provided by the Dayton Museum of Natural History. SunWatch Village is open to the public by paid admission from April through October.