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A REPORT OF SIGNIFICANT DATA RECOVERED FROM FEATURES
6 AND 48 ON SITE 20BE410 DURING ARCHAEOLOGICAL
INVESTIGATIONS UNDERTAKEN BY WESTERN MICHIGAN UNIVERSITY IN THE
LOWER GALIEN RIVER VALLEY OF SOUTHWEST MICHIGAN

1991

REPORT OF INVESTIGATIONS NO. 99

DEPARTMENT OF ANTHROPOLOGY
WESTERN MICHIGAN UNIVERSITY

William M. Cremin
1991

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The data reported herein were recovered during archaeological test excavations undertaken by Western Michigan University in the Lower Galien River Valley during April-May 1990. The work was performed while under contract to Resource Management Group of Grand Haven, Michigan and on behalf of this firm's client, Galien River Associates.

Following completion and submission of the project report in September, our work under contract was completed. Be that as it may, several objects that were not identified and treated in the report remained to be studied. This work we have undertaken without remuneration from project sponsors. Moreover, university resources have been available to us as we have sought to complete this follow-up analysis.

The authors wish to thank Dr. Donald E. Thompson, Vice-President for Research, and Dr. Laurel Grotzinger, Dean of the Graduate College, for providing the funds to obtain two priority ¹⁴C dates on samples of wood charcoal from these pit features. We are also grateful to Dr. Leonard Beving and his associates in the Department of Biological Sciences for providing us with Scanning Electron Microscope images (micrographs) of the corn specimen from Feature 6. Finally, we are indebted to Dr. John Grace of the Geology Department for performing X-ray Spectrometer analysis of the fragmentary metal artifact recovered from Feature 48.

W.M.C.
G.R.W.
D.B.G.

INTRODUCTION:

During Spring 1990, archaeologists from Western Michigan University conducted test excavations at a series of site loci occupying morainal uplands overlooking the wetland-choked lower Galien River in the southwest corner of Lower Michigan. While the results of our program of research have been previously

reported (Cremien 1990), it is our intent here to elaborate upon the potential significance of two observations made on site 20BE410 and not included in the project completion report prepared last year. Specifically, we refer to the recovery of a carbonized kernel of developed Eastern Complex maize or corn retrieved from deep within Feature 6, a roasting pit which also produced the remains of aquatic tubers, and an object of European trade brass recovered from Feature 48--data which had not been positively identified as our report of Phase II excavations was going to press.

Site 20BE410 is one of five sites occupying a pronounced landform rising above the river valley. It is located on the edge of the bluff where an intermittent stream occupying a steep-sided ravine enters the marsh flanking the Galien River from the south in the NE 1/4, NW 1/4, SW 1/4 of Section 2 of New Buffalo Township (T85 R21W), Berrien County, Michigan (Cremien and Walz 1989). Originally defined on the basis of an isolated occurrence of one bifacial thinning flake observed during Phase I investigations of this landform, follow-up testing of this site loci revealed a complex of subsurface features centered on a sandy knoll occurring

Feature 6 was examined by us on our last day in the field. Inasmuch as we had already excavated 24 pits, including 16 identified as deep roasting pits, during fieldwork on this landform, and were in the process of "packing up" for our return to campus, we elected to excavate this "deep roaster" only in part. One-half of the pit was carefully removed so as to expose and document its profile, and the fill collected during this operation was passed through 6.4 mm mesh screen. Charcoal was hand collected as excavators proceeded downward and, secondarily, from the sifting screen. But no flotation samples were taken. Be that as it may, numerous large pieces of wood charcoal were recovered, especially from the basal fuel zone where charred fragments of aquatic tubers were also observed. And when a corn kernel was found in the redeposited fill immediately overlying the fuel zone, a 50.4 g wood charcoal sample was prepared for shipment to Beta Analytic to obtain a radiocarbon date on this pit. The 14C date obtained for Feature 6 is 310±50 years: A.D. 1640 (Beta-43052), providing multiple intercept calibrated ages of 1529, 1556, and 1634 (Stuiver and Reimer 1986). Not only are this date and the calibrated ages for Feature 6 most consistent with

THE FEATURE 6 CORN KERNEL:

at an elevation of about 196.2 m ASL (Cremitt 1990:12). Six of 9 pit features recorded for this site are interpreted to represent deep roasting facilities; features commonly encountered on late prehistoric Berrien Phase sites in southwest Michigan. A radio-carbon date of 350±60 years: A.D. 1600 (Beta-37615), yielding multiple intercept calibrated ages of A.D. 1494, 1502, 1506, and 1605 (Stuiver and Reimer 1986), obtained for Feature 4 would seem to confirm the Berrien Phase temporal placement (Cremitt 1990:28-29).

Eastern Complex corn is described as characteristically 8-rowed, with kernels that are thick, rounded, and broader-than-deep (Wagner 1986; Yarnell 1964). Ford (1973) states that through time the trend toward larger cobs and, presumably, kernels is well established from archaeological specimens. Wagner (1986:122) has presented metrical observations on a sample of developed Eastern Complex 8-rowed corn kernels from 12 Fort Ancient sites (ca. A.D. 950-1650). By site these specimens show mean measurements (uncorrected for shrinkage

corn. Anthropology as a kernel of developed or evolved Eastern Complex Ethnobotanical Laboratory of the University of Michigan Museum of 6 has since been positively identified by Sandra Dunovan of the specimens found immediately overlying the basal fuel zone in Feature 3 on this same site) were at that time positively identified as American lotus (Nelumbo lutea) by him, other specimens remained unidentified at the conclusion of his study. One of the plant several fragments of aquatic tubers from Feature 6 (and also Feature excavation of pits to establish their cross-sectional form. While hand collected or retrieved from the sifting screen during the contents of 643 1 of Feature 111 and charcoal specimens that were on this landform (see Walz in Cremien 1990:41-53) included the Gregory Walz's analysis of macrobotanical remains from the sites south of 208E410 and Feature 6 (Cremien 1990:28-29). Feature 40, a deep roasting pit on site 208E405 some 130 m to the also obtained identical results for a 14C sample collected from facility located approximately 12 m NNW of this pit, but we have those obtained and noted above for Feature 4, another deep roasting

resulting from carbonization) ranging from 5.4-9.1 mm in depth and 8.8-11.4 mm in width. The means recorded for all specimens (N=571) are 6.7 mm and 9.2 mm, respectively. Mean thickness calculated for the 60 kernels for which it proved possible to determine this measurement is 5.3 mm. Although kernel fragmentation has not permitted us to measure the thickness of the kernel from Feature 6, it is 7.5 mm in depth and 11.0 mm in length, placing it well within the range recorded by Wagner for her collection of Fort Ancient Eastern Complex specimens. In fact, the sheer robustness of our kernel argues strongly for a very late temporal placement within the span of time encompassing the kernels comprising Wagner's sample--an interpretation that is certainly consistent with the 14C date obtained for Feature 6.

Until recently, the carbonized corn cobs from Berrien Phase smudge pits on the Moccasin Bluff site constituted the only direct evidence for aboriginal corn agriculture among late prehistoric/ protohistoric residents of southwest Michigan. Ford's (1973) analysis of the cobs in question noted their high degree of "Easternization" and, furthermore, that by all measurements the Moccasin Bluff corn was comparable with an archaeological age after A.D. 1400 (1973:192).

In the years since Ford's study, Elizabeth Garland and her associates (Garland and Mangold 1980; Garland and Clark 1981) have reported on the Wymer site located in the St. Joseph River flood-plain about 10 km downstream from Moccasin Bluff. Although only minimally tested, the late prehistoric component on Wymer shows strong Berrien Phase affiliations. In fact, several lines of

evidence summarized by Cremin (1983:94) make a strong case for this site having been the location of an agricultural village not unlike Moccasin Bluff. It is especially noteworthy that Richard Ford has identified a corn cupule recovered during the testing of Wymer as representing a late prehistoric race of maize!

While this review of documented occurrences of developed Eastern Complex corn in Berrien Phase contexts establishes the importance of our discovery, especially in light of the 14c date obtained for the pit feature in which our corn kernel was found, in the absence of better control over data recovery (as might have been established had soil samples from Feature 6 been collected and floated) and given that we have only a single specimen on which to base our interpretations, we must proceed with caution. We cannot, for example, determine whether corn was being grown on the landform overlooking the Galien River where 20BE410 (and several presumably related sites) is located and was being harvested and processed for consumption in autumn together with aquatic tubers being collected in the floodplain below this site. Furthermore, our program of site testing did not allow us to determine whether the sites recorded represent discrete loci or, alternatively, a single, albeit dispersed, settlement essentially coterminous with the limits of the landform itself. Rather, we can only argue that the sites, as presently defined, are generally contemporaneous and suggestive of multi-seasonal or year round occupation of the bluffs overlooking the Lower Galien River.

THE BRASS ARTIFACT FROM FEATURE 48:

Feature 48 on 20BE410 is located approximately 3.5 m NW of

Feature 6 in Test Square 1 and was defined at a depth of 40 cm below ground surface. When delineated in plan view this soil stain featured a moderately heavy concentration of charcoal and fire-cracked rock in a dark organic matrix measuring 118 cm X 148 cm. Cross-sectioning revealed a basin extending below the plane of origin for 39 cm and consisting of a single fill unit varying little in color and texture from top to bottom. The precise function of this pit prior to its having served as a receptacle for camp trash has not been ascertained.

During cross-sectioning of Feature 48, the base of a Madison point and a fragmentary object of metal were retrieved from the first 10 cm level. No other diagnostic artifacts were found in this pit. A 10 l sample of feature fill was collected from deeper within the pit for subsequent processing by flotation.

Although clearly not a roasting pit, the presence of the late prehistoric-early historic Madison point and this feature's close proximity to a number of distinctive roasting facilities on the site give little reason to doubt its Berrien Phase affiliation. Moreover, the presence of the metal object in association with the projectile point, in combination with three 14C assays that suggested occupation of our sites might well transcend the period of arrival of European trade items in advance of direct contact with Frenchmen penetrating the Upper Great Lakes during the second half of the 17th century, encouraged us to treat this feature and its contents very carefully.

The piece of rolled metal recovered from this feature has the appearance of chain link, with a 14 mm segment of one arm missing. Overall length is 27 mm from curved end to curved end, and its

thickness, while varying slightly along its entire 42 mm length, is approximately 0.25 mm. This observed variation in thickness would suggest that the object was hand forged or shaped rather than machine pressed.

Importantly, microscopic examination of the break points

on this object counters the interpretation that this is a piece of chain link. There is no evidence for either cracking or twisting of the metal. Rather, the breaks are highly beveled,

as if this were in fact an oval or oblong "loop" that had become separated or detached from the object to which it had formerly

been joined. The only analog for which our metal object seems well suited is that of a loop in a flushloop bell such as are

illustrated in Mason (1986:106, Plate 11.4; especially the example in the lower left-hand corner). However, the bells recovered by

Mason from the Rock Island II site are European trade items of brass and, judging from the size of the loops illustrated, the

bell that would have been attached to our loop could be expected to be somewhat larger; perhaps twice the size of any specimens

shown in the Mason plate.

Having addressed the possible function of the metal object

recovered from Feature 48, it remains for us to explain how we

were able to ascertain that this artifact is brass and of European origin rather than being a product of native metallurgy fabricated

from copper available to residents of the Great Lakes for thousands of years prior to European contact. This is a matter of no small

consequence, inasmuch as trade brass has not been previously reported for Berrien Phase contexts; albeit generally contemporaneous Huber

Phase sites in the Greater Chicago Area are known on the basis of European trade items to have been occupied into the late 17th century (Faulker 1972:165-166).

Initially, and following instructions provided by Peter Ramsden of McMaster University (personal communication), we performed a scratch test on our metal object. This involved exposing a fresh surface to reveal either a reddish or yellowish tint; red if copper and decidedly yellow if brass. The results of this test were determined by us to be inconclusive.

Thereafter, we proposed to follow Olsen (1962) and submit our specimen for nondestructive analysis by X-ray Spectrometry. Olsen had noted that "some of the soft brasses (with very low zinc content) might defy visual determination", in which case "the X-ray method is immediately useful to distinguish trade, or European, brass from natural elements (1962:237). And he amply demonstrated his contention by analyzing, among others, samples of native copper from Upper Michigan and comparing these with copper artifacts from sites such as the protohistoric Dumaw Creek site in western Lower Michigan (Quimby 1966:43) and samples of trade brass (1962:235).

With the assistance of John Grace of the WMU Geology Department, our metal object and control samples of Lake Superior float copper and two pieces of modern brass were analyzed using a Norelco Universal Vacuum Spectrograph (Model No. 120-102-00). The X-ray tests run on the artifact conclusively demonstrated that it was of European origin. It contained a large quantity of copper combined with a significant amount of zinc. Peaks representing these

two elements in our artifact were only slightly less strong than those recorded for the modern brass control samples, most likely reflecting differences in smelting processes over time. By way of comparison, the native copper control samples showed the same strong peak for copper, but the zinc peak was barely detectable! Having in the above manner determined that our metal artifact was brass rather than native copper, and further armed with four radiocarbon determinations that pointed to a Bernien Phase occupation(s) of sites on the landform that extended from late prehistoric into protohistoric times, we proposed to put the issue to rest by dating the pit in which the brass object had been found. A 31.2 g sample of wood charcoal collected from the 10 I flotation sample taken from deep within Feature 48 was prepared and submitted to Beta Analytic. The resulting determination of 2490±60 years: 540 B.C. (Beta-43053) is entirely unacceptable, and we must conclude that the sample submitted was contaminated by us either during retrieval or handling of the original soil sample and its charcoal content. In this regard, it is perhaps noteworthy that of the five 14C samples collected and submitted to the laboratory, only this one was taken from flotation material. The others were hand collected during excavation of features and were immediately placed in foil and stored in plastic vials until selected for submission. The wood charcoal comprising the sample in question, to the contrary, was handled extensively during flotation processing and subsequent sorting of sample fractions by WMU archaeological field school personnel who had received minimal training prior to working with flotation derived material.

CONCLUSIONS:

Our intent in this report has been to describe two potentially significant pieces of information and the circumstances of their discovery during Phase II archaeological investigations conducted last year. This information was not available as of the date our project completion report went to press in September 1990. While these data do not really come as a "surprise" to those of us engaged in researching the late prehistoric/protolithic Berrien Phase of southwest Michigan, they do provide additional evidence in support of long held points of view.

First, with respect to our kernel of corn, we can now claim a third documented occurrence of this tropical cultigen in a Berrien Phase context. And, importantly, the feature 6 corn from 208E410 has been radiocarbon dated to the late prehistoric/proto-historic interface! While we are unable to ascertain from the limited evidence available to us the extent to which these people relied on a local corn crop to sustain them, it is of great importance that we here add another archaeological occurrence of corn, this time from the Lower Galien River Valley, to those occurrences previously reported for the Moccasin Bluff and Wymer sites in the St. Joseph River Valley. Thus, our recent discovery certainly helps us bridge the "void" between these late prehistoric/proto-historic farmers and those groups associated with agricultural settlements on the St. Joseph in recorded history.

With respect to the metal artifact found in Feature 48 together with the base of a Madison point, we now believe that it is fair to say that a much stronger case can be made for this phase having

extended beyond prehistory in southwest Michigan. This artifact of European trade brass, together with the dates we have obtained, tells us that this Upper Mississippian cultural formation remained viable at least into the period when trade goods were reaching the southern Lake Michigan Basin in advance of the arrival of the French in the region. The ultimate benefit of our being able to extend the Berrien Phase into the 17th century is that it should speed us on our way toward linking this archaeological phase with a named tribal entity such as the Potawatomi or Miami, both of whom are identified in the historical documents as native residents of southwest Michigan during the period of initial French exploration and colonization after ca. 1680.

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