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69-Archaeobotanical Analysis of Flotation Residues from the Jamestown Site (21c4-14), the Northfield, Burning Star Mine# 4, Perry County, Illinois

William M. Cremin
Western Michigan University

DEPARTMENT OF ANTHROPOLOGY
WESTERN MICHIGAN UNIVERSITY

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ARCHAEOBOTANICAL ANALYSIS OF FLOTATION RESIDUES FROM THE JAMESTOWN SITE (21C4-14), THE NORTHFIELD, BURNING STAR MINE # 4, PERRY COUNTY, ILLINOIS

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Jamestown (21C4-14) is a large multicomponent site overlooking the confluence of Rock Fork, Bonnie, and Galum creeks in the Northfield, Burning Star Mine # 4, Perry County, Illinois. The Northfield is an area of mature topography featuring the gently rolling hills and broad alluvial valleys typical of the Till Plains province of south-central Illinois. Floristically, it lies within the Oak-Hickory Forest Region of the Western Mesophytic Forest (Braun 1950). However, the local pattern of vegetation can best be described as forest-prairie ecotone, and the Jamestown site is optimally situated to have afforded its occupants easy access to the plant resources of forested creek bottoms, wooded uplands, and the prairie.

Although problematic, a reconstruction of the presettlement vegetation derived from the Government Land Office Survey fieldnotes and plats suggests sparce and thinly timbered forests broken by prairie lands exhibiting an overall zonal configuration conforming to the north-south course of Galum Creek and its tributaries. The forest occupying creek bottoms near the site supported a varied tree cover reflecting the water retention qualities of the soils. Water tolerant trees such as the pin oak, green ash, slippery elm, and sourgum, with occasional cottonwood and sycamore, flanked area streams; whereas drier sites supported white oak. The understory in disturbed areas consisted of vines, grapes, and greenbrier intermingled with the young stems of dominant canopy species.

Ground cover adjacent to streams was in all probability composed of sedges, grasses, rushes, and water tolerant members of the arum and cat-tail families.

The wooded slopes above the bottoms were dominated by the white oak. Important codominants included black oak, black walnut, American elm, ash, basswood, and assorted hickories. Shrubs of potential economic importance were the hawthorns, plums, cherries, sassafras, sumac, and hazelnut.

Post oak flats had a more restricted distribution than either of the aforementioned forest communities and were dominated by the post oak and blackjack oak. Pignut hickory was also an important constitutent of the canopy, and shrubs of the hazelnut frequented these "barrens" as well.

Finally, tall grass prairie, supporting big bluestem, Indian grass, wild rye, switch grass, and slough grass occurred within a short distance of the site in all directions.

Archaeological investigation of the Jamestown site by American Resources Group, Ltd. of Carbondale, Illinois between 1979 and 1984 has revealed a most interesting occupational history. Minor Middle Woodland and historic Indian components are represented, as is a Mississippian component characterized by three structural complexes (documenting nine distinct episodes of house construction) and their associated features. But most impressive is the abundant cultural material indicating a lengthy and substantial Late Woodland occupation characterized by a community plan comprising five pole structures, four pit houses,

and hundreds of in ground facilities used in the processing and/or storage of foodstuffs and other village activities--all purposefully grouped around a central courtyard or plaza.

Sample Selection and Analytic Procedures

This analyst received from ARG a total of 141 flotation samples from 97 feature proveniences. With few exceptions, these were collected as standard 10 l soil column samples during the cross-sectioning of features. If a particular feature exhibited a uniform fill, a single sample was secured. In the event that multiple fills were observed, the excavator collected a 10 l soil sample from each fill unit. The soil samples were then processed employing the tub-agitation method (Struever 1968), after which the light and heavy fractions were air dried and bagged separately.

With the single exception of Feature 326, all flotation residues were initially sorted by ARG personnel, with the recognized botanical materials being separated into the categories of wood charcoal, nutshell, seeds, and unidentified plant parts prior to submission of all but the wood charcoal to this analyst for study. The very large sample from Feature 326, aggregating 1611.50 g by weight, was, however, received in an unprocessed form, requiring that it be treated to disaggregate cohesive sediments before sorting of the botanical component for the purpose of quantification and identification could commence. With respect to comments regarding wood charcoal, it should be understood that aside from some small unidentifiable pieces found among the nutshell in a number of samples and the specimens

recovered during processing of Feature 326 in the laboratory, all references to wood charcoal counts and weights are derived from the analytic sample sheets accompanying each of the 141 flotation samples submitted for analysis.

In the laboratory, all sorting, counting, and detailed identifications of the botanical material was accomplished using 10X-20X magnification and reference to standard wood and seed identification manuals (Core, Cote, and Day 1979; Martin and Barkley 1961; Montgomery 1977; and USDA 1974). In addition, many of the specimens were compared with fresh and carbonized material collected and prepared by Mr. David DeFant and the analyst and maintained as type sets in the Archaeology Laboratory at Western Michigan University.

Data Presentation

Table 1 summarizes the plant residues recovered from 141 samples representing 97 features from the Jamestown site. Note that:

1. the total counts recorded for Feature 326 are derived from a subsample rather than quantification of the entire contents of the botanical component from the pit; and
2. a considerable amount of wood charcoal (and bark) was extracted from samples and quantified by ARG personnel, with both precise and some approximate counts and the total weights for each sample being reported on the analytic sample sheets.

It is <u>estimated</u> that approximately 53,805 carbonized plant

TABLE 1. SUMMARY OF BOTANICAL RESIDUES FROM FLOTATION SAMPLES, JAMESTOWN SITE (21C4-14), PERRY CO., IL.

Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
17	53	10 l		Carya laciniosa (Shellbark Hickory) 85 / 2.28		
34	109	10 l		Carya sp. 1 / .07		
41	95	10 l		Carya sp. (prob. C. laciniosa) 76 / 4.35	Potamogeton sp. (pondweed) 1 / .01 Najas sp. (naiad) 1 / .01 Prunus americana (American plum) 1 / .14	
47	106	10 l		Carya sp. 8 / .25		
49	89	10 l		Carya sp. 2 / .08 Juglans nigra (Black Walnut) 1 / .03		
50	208	10 l		C. laciniosa 4 / .16		
	210	10 l		Carya sp. 2 / .11		
56	128	10 l		C. laciniosa 4 / .26		
60	200	10 l				3 fungal nodules

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
61	115	10 l		C. laciniosa 1 / .05		1 fungal nodule
65	113	10 l		Carya sp. 1 / .10		
66	145	10 l		Carya sp. 52 / 1.10	unid. seeds 2 / .02	
	146	10 l		C. laciniosa 6 / .34		
73	119	10 l		Carya sp. 15 / .55		
	137	10 l		Carya sp. 4 / .09		
79	154	10 l		C. laciniosa 16 / .46		
	155	10 l		C. ovata (Shagbark Hickory) 24 / .65 C. laciniosa 10 / .30	Prunus serotina (Wild Black Cherry) 1 / .04 Diospyros virginiana (Persimmon) 1 / .08	
	156	10 l		C. laciniosa 11 / .27		
	157	10 l		C. laciniosa 10 / .44		
	158	10 l	unid. charcoal 1 / .03	Carya sp. 4 / .25		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
79	160	10 l		Carya sp. (prob. C. laciniosa) 9 / .32		
80	194	10 l		Carya sp. 6 / .21	Rhus glabra (Smooth Sumac) 12 / .09	
83	125	10 l		Carya sp. 5 / .14 J. nigra 1 / .05		
86	124	10 l		Carya sp. 15 / .44		
91	213	10 l	unid. charcoal 1 / .01	C. tomentosa (Mockernut Hickory) 14 / .54		
92	181	10 l		Corylus americana (Hazel-nut) 1 / .15		
	183	10 l		C. laciniosa 3 / .20		
98	136	10 l		C. laciniosa 60 / 4.53		
99	138	10 l		C. laciniosa 19 / 1.11		
100	163	20 l		C. tomentosa 12 / 1.04 Carya sp. 5 / .09		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
100	164	10 l			Potamogeton sp. 12 / .01 Polygonum erectum (Knotweed) 6 / .02 R. glabra 3 / .01	
106	205	10 l	unid. charcoal 2 / .10	C. laciniosa 21 / 1.21		
119	282	10 l		Carya sp. 5 / .15		
120	202	10 l		Carya sp. 9 / .21		
124	177	10 l		Carya sp. 11 / .63		
137	237	10 l		Carya sp. (prob. C. laciniosa) 5 / .30		
138	241	10 l		Carya sp. 5 / .11		
139	332	10 l		C. laciniosa 56 / 2.08 J. nigra 2 / .78		
	333	10 l		C. laciniosa 8 / .34		7 fungal nodules
	335	10 l		Carya sp. 11 / .24	unid. seed 1 / .01	1 fungal nodule

TABLE 1. SUMMARY OF BOTANICAL RESIDUES FROM FLOTATION SAMPLES, JAMESTOWN SITE (21C4-14), PERRY CO., IL.

Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
139	336	10 l		Carya sp. 8 / .18		
141	245	10 l		C. ovata 9 / .28	R. glabra 9 / .02 Polygonum sp. 2 / .02	16 fresh seeds of amaranth/ pigweed
142	246	10 l		C. ovata 42 / 1.89 C. laciniosa 7 / .38	R. glabra 1 / .01	2 fresh amaranth seeds
148	253	10 l		Carya sp. (prob. C. glabra or Pignut) 4 / .27		
151	303	10 l		Carya sp. 4 / .11		
	307	10 l			Scirpus sp. (Bulrush) 5 / .01	5 unid. fresh seeds
168	322	10 l		Carya sp. 3 / .14 J. nigra 1 / .11		
	324	10 l		Carya sp. 3 / .14		
	342	10 l			R. glabra 1 / .01	

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
172	320	10 l			Polygonum sp. 1 / .01 R. glabra 13 / .08	
182	359	10 l		Carya sp. 14 / .31		
184	342	10 l		Carya sp. 4 / .11	R. glabra 1 / .01	
	346	10 l		Carya sp. 5 / .27		
196	385	10 l		C. glabra 8 / .83		
200	386	10 l		Carya sp. 8 / .25		
205	399	10 l		Carya sp. 4 / .09		
215	404	10 l		Carya sp. 5 / .20 J. nigra 2 / .22		
224	463	10 l		C. laciniosa 8 / .57		7 fresh seeds of chenopod
228	447	10 l		C. laciniosa 4 / .23		
238	489	10 l		Carya sp. 1 / .09		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
238	490	10 l		C. laciniosa 14 / .69 J. nigra 1 / .13		
253	527	10 l		C. ovata 1 / .12 Carya sp. 12 / .39		
264	571	30 l		C. ovata 100 / 4.11		
	577	20 l		Carya sp. 17 / .48		
265	570	10 l		C. ovata 3 / .11		
284	594	10 l		Carya sp. 8 / .29	Sassafras albidum (Sassafras) 1 / .02	
	609	10 l		Carya sp. 2 / .11		
287	596	10 l		C. laciniosa 7 / .45		
288	445	10 l		Carya sp. 3 / .08		
289	604	10 l		Carya sp. 13 / .26		1 fungal nodule

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
289	605	10 l		C. laciniosa 9 / .89	P. erectum 28 / .09 Chenopodium sp. (Goosefoot or Lamb's quarter) 1 / .01	
292	620	10 l		Carya sp. (prob. C. laciniosa) 43 / 1.25		
294	649	10 l		Carya sp. 5 / .23		3 fresh amaranth seeds
	653	10 l	unid. charcoal 2 / .02	C. laciniosa 58 / 1.74		
	654	10 l		C. ovata 2 / .05 C. laciniosa 1 / .06 Carya sp. 28 / .64		
298	628	10 l		Carya sp. 3 / .08		
305	636	10 l		C. ovata 117 / 2.99 C. laciniosa 26 / 1.39 C. glabra 2 / .17 Carya sp. 186 / 3.93		

TABLE 1. SUMMARY OF BOTANICAL RESIDUES FROM FLOTATION SAMPLES, JAMESTOWN SITE (21C4-14), PERRY CO., IL.

Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
312	643	10 l		C. glabra 3 / .18		
326	689	90 l				

This large flotation sample, aggregating 1611.50 g, required special processing in the laboratory to remove 570.20 g of cohesive sediments and 47.40 g of miscellaneous materials prior to analysis of the botanical residues as follows:

- -100% examination of the botanical contents of the 6.7 mm mesh screen
- -6.5% control sample of the material retained by the 1.7 mm mesh screen, with some scanning of the residues comprising the remainder for any diagnostic (especially seed) specimens
- -the material passing through the 1.7 mm sieve and aggregating 270.10 g by weight was quickly scanned for small seeds but not otherwise studied and has not been included in the estimate of feature contents presented below

Ulmus americana (American Elm) 6 / .90	C. ovata 315 / 8.20
Quercus sp. (Red Oak group) 5 / .90	C. laciniosa 207 / 32.13
Ring-porous 5 / .71	C. cordiformis (Bitternut Hickory) 172 / 9.46
unid. charcoal 490 / 9.00	Carya sp. 42,182 / 644.88
Bark Type A 39 / 6.66	
Bark Type B 8 / 1.40	
unid. bark 155 / 9.56	

332	707	10 l			P. erectum 1 / .01	

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
332	708	10 l		Carya sp. 4 / .17		
	709	10 l		C. laciniosa 4 / .22		
340	710	10 l		J. nigra 1 / .06 Carya sp. 18 / .21		
	711	10 l		Carya sp. 43 / .80		
344	717	10 l		C. laciniosa 20 / .78 J. nigra 1 / .08		
	718	10 l		Carya sp. 2 / .06		
	719	10 l		C. ovata 14 / .32	P. erectum 1 / .01 unid. seed fragment 1 / .01	
348	733	10 l		C. laciniosa 42 / 2.21 C. ovata 11 / .33 Carya sp. 58 / 1.39	P. erectum 3 / .01 Chenopodium sp. 2 / .01	
356	744	10 l		C. ovata 360 / 13.47 C. laciniosa 10 / 2.09		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
363	762	10 l		Carya sp. 5 / .35	P. serotina 1 / .02	
	763	10 l	unid. charcoal 18 / .13	J. nigra 19 / .75 C. laciniosa 12 / .78 C. ovata 8 / .16 Carya sp. 186 / 2.91 unid. nut meat 3 / .24		
	764	10 l		Carya sp. 1 / .03		
	765	10 l		Carya sp. nut meat 1 / .11 Carya sp. 27 / .74 Quercus sp. 1 / .01		
377	787	10 l		Carya sp. 17 / .46 Quercus sp. 1 / .05		
378	784	10 l		Carya sp. 16 / .38	R. glabra 1 / .01	
395	825	10 l		Carya sp. 4 / .15		
	826	10 l		C. glabra 9 / .28		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
395	827	10 l		Carya sp. 2 / .14		
401	850	10 l		C. tomentosa 1 / .15 J. nigra 1 / .12 Carya sp. 4 / .06		
408	851	10 l		C. glabra 43 / 1.32		
410	857	10 l		Carya sp. 5 / .18	Crataegus sp. (Hawthorn) 1 / .08	
	1195	10 l		C. ovata 17 / .71		
412	856	10 l		Carya sp. 9 / .30		
415	862	10 l		C. laciniosa 6 / .42		
422	867	10 l		Carya sp. 28 / .55		
440	895	10 l		Carya sp. 3 / .10		
442	900	10 l			prob. D. virginiana 1 / .03	
450	913	10 l		C. laciniosa 33 / .74		3 fresh amaranth seeds

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
451	925	10 l		Carya sp. 6 / .16	Chenopodium sp. 2 / .01	
460	926	10 l		C. ovata 18 / 1.93		
461	927	10 l		C. laciniosa 54 / 5.39 C. ovata 16 / 1.00 Carya sp. 753 / 11.88		
	(925)	10 l	unid. charcoal 39 / .53	C. laciniosa 30 / 1.76 Carya sp. 147 / 2.08 Quercus sp. 2 / .01		
462	937	10 l		C. tomentosa 2 / .20 J. nigra 1 / .17 Carya sp. 54 / 1.55 Quercus sp. 47 / 1.16	R. glabra 46 / .14	
463	943	10 l		C. ovata 30 / 1.32	R. glabra 2 / .03 unid. seed 1 / .01	
	949	10 l		C. laciniosa 16 / .96		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
470	973	10 l		C. laciniosa 22 / 1.00		
	973A	10 l		C. tomentosa 13 / .55		
	973B	10 l		C. ovata 1 / .15 Carya sp. 14 / .69		
	973C	10 l		C. ovata 3 / .12 Carya sp. 16 / .58		
	973D	10 l		C. laciniosa 34 / 1.35		
472	900	10 l		Carya sp. 7 / .21		
	984	10 l		C. cordiformis 24 / .95		
482	1002	10 l	unid. charcoal 6 / .37	Carya sp. 49 / 1.05		
487	1008	10 l		Carya sp. 10 / .33		
	1009	10 l		Carya sp. 7 / .20		
502	1021	10 l		Carya sp. 17 / .56		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
510	1043	10 l		Carya sp. (prob. C. ovata) 4 / .12		
514	1050	10 l		C. laciniosa 3 / .28		
	1051	10 l		C. laciniosa 4 / .26		
515	(Zone A)	10 l		C. ovata 4 / .21		
528	1072	10 l		Carya sp. 5 / .24		
	1077	10 l		C. tomentosa 1 / .25 J. nigra 1 / .11 Carya sp. 19 / .95		
532	1090	8 l		Carya sp. 2 / .08	Chenopodium album (Lamb's quarter) 3 / .01	
580	1128	10 l		J. nigra 5 / .50 Carya sp. 10 / .26		
593	1174	10 l		Carya sp. 35 / 1.18	P. erectum 27 / .06	
613	1205	10 l		C. ovata 13 / .63		

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Feature Provenience	Analytic Sample	Sample Volume	Wood Charcoal no / wt (g)	Nutshell/Hull/Meat no / wt (g)	Seeds no / wt (g)	Other/ Comments
614	1201	10 l		C. tomentosa 39 / 1.55		
618	1204	10 l		Carya sp. (prob. C. laciniosa) 3 / .15		
620	1221	10 l		C. laciniosa 134 / 4.89		
627	1219	10 l		Carya sp. 15 / .48		
628	1222	10 l		C. tomentosa 153 / 6.79		
TOTALS:						
97	141	1528 l	777 / 30.32 (an additional 5635+ / 373.78 of charred wood material from the floats was recorded by ARG personnel prior to receipt of the 141 samples)	47,196 / 839.12	197 / 1.18	

specimens, aggregating 1244.36 g by weight, comprise the botanical residues from the 141 flotation samples submitted for study. Importantly, with respect to the comments and statistics which are offered below, the analyst has considered only those 139 samples from 95 features presumed to be Late Woodland in origin on the basis of information provided by Mr. Mark Wagner of American Resources Group, Ltd. The samples from Feature 120 (a historic Indian burial) and Feature 532 (a Mississippian hearth associated with Structure 7), while summarized in Table 1, will not be further discussed inasmuch as their botanical contents provide too little in the way of information for fruitful comparison with Late Woodland feature residues. This is to say that their contents are too meager and, furthermore, they do not appear to be at all dissimilar from those found in the Late Woodland features.

Wood Charcoal (and Bark)

An estimated 6,408 wood charcoal and bark fragments, weighing 404.10 g, were found in flotation samples from 90 of 95 Late Woodland features. Weight by sample ranged from less than .01-2.64 g per liter of feature fill floated, with the mean density for all features being .27 g/l.

This mean density compares quite favorably with the mean densities reported by Asch and Asch (1981: 279) for a series of Late Woodland White Hall components at the Newbridge (.50 g/l), Carlin (.38 g/l), and Weitzer (.13 g/l) sites in the Lower Illinois Valley of west central Illinois. While differences in

the mean density values are apparent, whether these differences are a reflection of feature function, discard patterns that influenced the manner in which features were refilled and covered after use, postoccupation conditions of preservation, or methods of data collection cannot at this time be determined.

Some minimal qualitative information is available for Feature 326. Although 490 (96.9%)of 506 wood fragments are unidentifiable, David DeFant has determined that six (1.1%) specimens are American elm, five (1.0%) are assignable to the red oak group, and five (1.0%) can be placed in the category of ring-porous. Sorted and quantified bark residues consist of 202 specimens, 39 (19.3%) and eight (4.0%) pieces of which are distinctive enough to warrant separation into types, albeit positive identification to the generic or specific level is impossible.

Nuts

One hundred and thirty two flotation samples from 92 of 95 Late Woodland features contained carbonized nut fragments. These residues are estimated to number 47,185 pieces and comprise 87.7% of all carbonized plant remains. By weight, the total for nut residues is 838.83 g, or 67.4% of the Late Woodland botanical component. Ranging from less than .01-7.72 g/l of fill in the flotation samples, this quantity yielded a mean nut density of .56 g/l for all nut residues in the samples. The mean density for nuts is more than twice the mean density of .27 g/l recorded for wood charcoal, and the resulting nutshell/wood charcoal ratio is 2.07.

The above totals are, however, greatly skewed by the very

large quantity of nutshell residues found in 90 l of fill collected from Feature 326. The estimated 42,876 pieces of nutshell, aggregating 694.67 g by weight, from this feature represent 91.0% by count and 82.2% by weight of all nutshell residues in the samples. Excluding the sample from Feature 326 from consideration, the mean density of nut residues diminishes to 144.16 g/1420 l = .10, while that for the wood charcoal reduces to 374.97 g/1420 l = .26. The weight ratio of nut residues to wood charcoal is now dramatically reversed, reducing to 144.16 g/374.97 g = .38.

Interestingly, while the revised mean density of nutshell residues (.10 g/l) and the nutshell:wood charcoal ratio (.38) for the Jamestown site now appear significantly reduced, they remain greater than the mean density values and ratios cited by Asch and Asch (1981: 279) for Late Woodland features at Newbridge (density = .05 g/l; ratio = .09) and Carlin (density = .05 g/l; ratio = .14). However, while the Weitzer site mean nutshell density of .08 g/l is consistent with previous comparisons, the nutshell:wood charcoal ratio for this site of .66 is 1.7 times greater than the value claculated for the Jamestown site, excluding Feature 326 from consideration.

Hickory nutshell represents the dominant nut residue, occurring in all 132 samples from 92 features yielding the remains of nuts. It comprises 99.4% by weight and 99.8% by count of all residues, and if Feature 326 is excluded, hickory nut still accounts for 96.7% and 97.9%, respectively, of all remaining nutshell residues in 131 samples from 91 features.

Several Carya species are present in the nut residues, including both thin- and thick-shelled hickories. In descending order of frequency of occurrence in the samples, these are: shellbark hickory - 45; shagbark hickory - 22; mockernut hickory - 8; pignut hickory - 6; and bitternut hickory - 2. As is apparent from the numbers, the thick-shelled species are especially well represented, with the thin-shelled bitternut being observed in but two samples. This is not unanticipated for Late Woodland contexts and has been posited as a subsistence trend of some significance in the Lower Illinois Valley, where decades of research have documented that the thin-shelled pecan and bitternut are noticeably more ubiquitous and abundant in both Archaic and earlier Woodland components (for example see Asch and Asch 1981).

Black walnut has a frequency of occurrence in the samples of 13, but in terms of both absolute weight (3.11 g; .40%) and count (N = 37; .08%) it is a very meager constitutent of the nut assemblage. A similar observation has been made for the acorn, the shell and kernels of which occur in only four of 132 flotation samples yielding nut residues. Comprising 51 (.10%) specimens and aggregating 1.23 g (.10% of all nut residues by weight), the acorn is most certainly underrepresented in the samples. Whereas hickory nutshell constitutes the predominant plant food byproduct, its relatively great abundance reflects in large part (1) its desirability as a fuel source, accounting for its frequent occurrence in contexts of combustion, and (2) the density of its shell, greatly facilitating incomplete combustion and preservation of the

hickory nut residues in quantities often exceeding the remains of wood charcoal in features. To the contrary, the fruit of the oak tree, albeit a potentially valuable food source, requires some special processing for human consumption and perhaps received somewhat different treatment with respect to deposition or discard behaviors on the part of its users. And with its fragile shell being less likely to withstand combustion and become carbonized or charred, the acorn is all too commonly preserved only in trace quantities; albeit the Jamestown site context in one in which this resource would have been relatively abundant and readily available for the human harvester in the immediate vicinity of the site.

Hazelnut is present as a trace element in the nutshell residues. Comprising but a single specimen weighing .15 g (.02% of all nutshell by weight), its limited occurrence is somewhat perplexing. The American hazelnut typically is found in a variety of lowland and upland settings, including thickets, undisturbed and disturbed woodlands, and edges that are formed along forest-prairie borders--habitats that were formerly common in the Jamestown site environs.

Although the quantity of nutshell in the samples, with the singular exception of Feature 326, is quite low, it is, however, ubiquitously present, occurring in 94% of the flotation samples from 92 features. In light of the excavation data, it seems reasonable to posit that the Jamestown village was occupied during most of the year, if not year round. The ubiquity of nutshell residues in these refuse contexts would

strongly suggest that nuts were stored for use by the residents of this site.

Seeds

Seeds are very poorly represented in the botanical residues, occurring in only 25 (18%) of 139 flotation samples from 25 different Late Woodland features. Also noteworthy is the observation that seeds were totally absent from the residues extracted from 90 l of fill from Feature 326, although this sample alone consisted of more than a kg of plant remains.

Numbering 196 charred specimens and weighing a mere 1.17 g, seeds comprise .36% by count and .09% by weight of all plant residues in the samples. To further illustrate the paucity of seed remains, the following ratios have been calculated and are offered for the Jamestown site and compared with similar ratios derived from data presented by Asch and Asch (1981: 279, 282-283) for the Late Woodland features at the Newbridge, Carlin, and Weitzer sites in the Lower Illinois Valley.

Jamestown	Newbridge	Carlin	Weitzer
1. number of seeds/grams of nutshell			
.23 (all samples)	144.10	85.40	.90
1.36 (excluding Feature 326)			
2. no. seeds/g wood charcoal			
.49	12.97	11.96	.59
3. no. seeds/l of fill			
.13	6.44	4.46	.08

While Jamestown may be hypothesized to have functions in ways similar to the Newbridge and Carlin villages or base camps, the only values recorded for the Lower Illinois Valley sites that are not markedly dissimilar from the Jamestown site ratios are those calculated for the Weitzer site--a community which is interpreted to have functioned as a seasonally specific, special-purpose camp in the Late Woodland subsistence-settlement system. With respect to the Newbridge and Carlin ratios, the values recorded above range from 24-627 times greater that the comparable statistics for the Jamestown site!

Perhaps the single most important criterion by which these observed differences can be measured is the environmental context in which the sites occur. Certainly, no one would argue that the potentials for a procurement strategy oriented toward food resources which might be anticipated to produce abundant seed residues in flotation samples from refuse pits is far greater in the broad alluvial valley of the Illinois River than in the context of the Upper Galum Creek drainage of Perry County, Illinois.

As disturbing as the absence of abundant seed residues is to this analyst, the kinds of seeds represented also present some interpretive difficulties. Cultigens of Mesoamerican origin are definitely not present in the seed residues, but native weed species include at least one plant that has been proposed (Asch, Farnsworth, and Asch 1979) as a "local" cultigen in west central Illinois, Polygonum erectum.

The starchy seeds of the erect knotweed have been observed in seven (28%) of 25 samples and comprise 69 (35%) of 196 specimens in the seed residues. Notable are the modest concentrations of 27 and 28 seeds recovered from Feature 593 and Feature 289, respectively. The remaining five samples contained between one and six seeds, while an eighth sample yielded a specimen identified as Polygonum sp.

The only other commensal identified in the Late Woodland residues is Chenopodium sp. These seeds, totaling five in number and occurring in three different samples, are certainly not the large-seeded species, C. bushianum, which along with P. erectum has been interpreted by some analysts to be a native cultigen in the Middle West (Asch, Farnsworth, and Asch 1979). However, one goosefoot seed is associated with the seeds of erect knotweed in Feature 289. Be that as it may, the small quantities in which the seeds of these weedy species occur in the samples is hardly solid evidence for their cultivation (or harvesting) having been an important economic activity for the residents of the Jamestown site.

Fleshy fruits of potential economic value are represented by 89 seeds of the smooth sumac, comprising 45.4% by count and evidencing the greatest ubiquity (10 samples, or 40%) recorded for seed residues, two seeds of black cherry and persimmon, each represented by a single specimen in two flotation samples, and one seed each of wild plum and hawthorn. These fruits would have been available to the site's inhabitants in late summer-early fall, and all are reported to have been stored

for later use.

With respect to the smooth sumac, this berry was popular among historic Indian groups throughout eastern North America, being eaten fresh or dried and stored for winter use. The most frequently reported use, according to Fernald and Kinsey (1958: 262)), was as a beverage, or "false lemonade". The concentration of 46 seeds in Feature 462 represents the best data available for the utilization of sumac by the inhabitants of the site. Be that as it may, it was probably of minor economic importance, as the fruit is small, virtually filled by the seed, and its subsistence value minimal.

Cultural use and deposition of the remaining seeds are questionable. The fruit of the sassafras has no reported value for humans, although Fernald and Kinsey (1958: 209-210) note the popularity of the roots for making tea and as a condiment and the dried leaves and pith as a "gumbo" for thickening soups and broths among Indians and whites alike.

The seeds of bulrush, pondweed, and naiad may have found their way into features as accidental inclusions--byproducts of the harvesting of aquatic tubers and rootstocks. For example, Asch and Asch (1981: 283) record the presence of bulrush seeds in the Newbridge site residues, and while no fleshy roots of this plant were preserved or identified, the occurrence of cat-tail root was noted (1981: 289). Fernald and Kinsey (1958: 110-111) do, however, state that historic Indians gathered the seeds of bulrush for food from July to winter.

In southern Illinois, one pondweed seed is reported by Lopinot (1982: 782) for a Late Woodland feature at Sa-86 in the Carrier Mills Archaeological District. His extensive literature search failed to document human use of the pondweed seed or the root-stock. He theorizes that the presence of this seed might be incidental to the exploitation of waterfowl, which are well known to utilize this plant for food and are also represented in this feature by their remains.

Concluding Remarks

Several conclusions appear warranted on the basis of the botanical residues examined from the Jamestown site in Perry County, Illinois. First, the Late Woodland inhabitants of this site were apparently not engaged in the cultivation of corn, squash, or the bottle gourd--tropical cultigens that are well documented for Late Woodland contexts elsewhere in the Middle West. Secondly, whether the seeds of erect knotweed, occurring in the samples in small quantities, but with two modest concentrations having been noted, reflect deliberate cultivation rather than harvesting of the seeds as they ripened on plants occurring naturally in disturbed habitats near the site, is problematic. Only a much larger sample of these seed residues, preferably derived from more than one Late Woodland context in the Northfield, will permit this question to be more fully addressed.

The remaining plant food resources represented by seeds in the samples would have occurred naturally in the Jamestown site environs, and while absolute seed densities are far too low for

ascertaining their economic value to the site's inhabitants, it is reasonable to conclude that the fruits of the hawthorn, wild plum, black cherry, persimmon, and smooth sumac were harvested for consumption when in season and/or for use later in the year.

While an argument can be advanced for human utilization of the starchy seed of goosefoot, the seed numbers and their ubiquity are such that accidental inclusion can not be ruled out as a possible explanation for their presence in the seed residues. Accidental inclusion also remains the most likely explanation for the presence of the remaining seed taxa in the residues.

Regardless of the position one takes with respect to the possible role of plant food resources represented by seed residues in the Jamestown flotation samples, the statistics and comparisons offered above strongly suggest that fruit and seed utilization was of relatively minor importance to the site's inhabitants.

With respect to the nutshell residues discussed earlier, the ubiquity and abundance of hickory nuts, and to a much lesser extend the remains of the other nut species, argue strongly for their economic importance, presumably not only when in season but as a food resource storedfor later use as well. That hickory nuts so dominate the residues, for example, at the expense of acorns, may reflect deliberate selection for this food--one that yields good quality protein and is rich in fats and oil. Alternatively, it dominant presence may reflect differential preservation of dense vs. thin-shelled

nut species and/or cultural preference for hickory nuts, particularly the thick-shelled species, as a source of fuel. These may explain, at least in part, the paucity of acorns in the nutshell residues and the relatively high nutshell: wood charcoal ratio calculated for the Jamestown botanical component.

While previous analyses undertaken for sites in the Northfield (Cremin 1983) have resulted in very similar observations, the samples of plant residues were considerably smaller, both from the perspective of the quantity of feature fill processed by flotation and the resultant residues, necessarily limiting the interpretive potential of the data sets. This opportunity to examine a relatively large sample of features from a substantial habitation site makes interpretation of the data, albeit similar, much the stronger. Thus, while the Jamestown site in situated in the Upper Galum Creek drainage of the Till Plains province, an area of forest-prairie ecotone in which the dominant arboreal species everywhere are the oaks, it is an observation of no small consequence that the hickory nut appears to have played the major role in the Late Woodland plant resource procurement strategy.

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