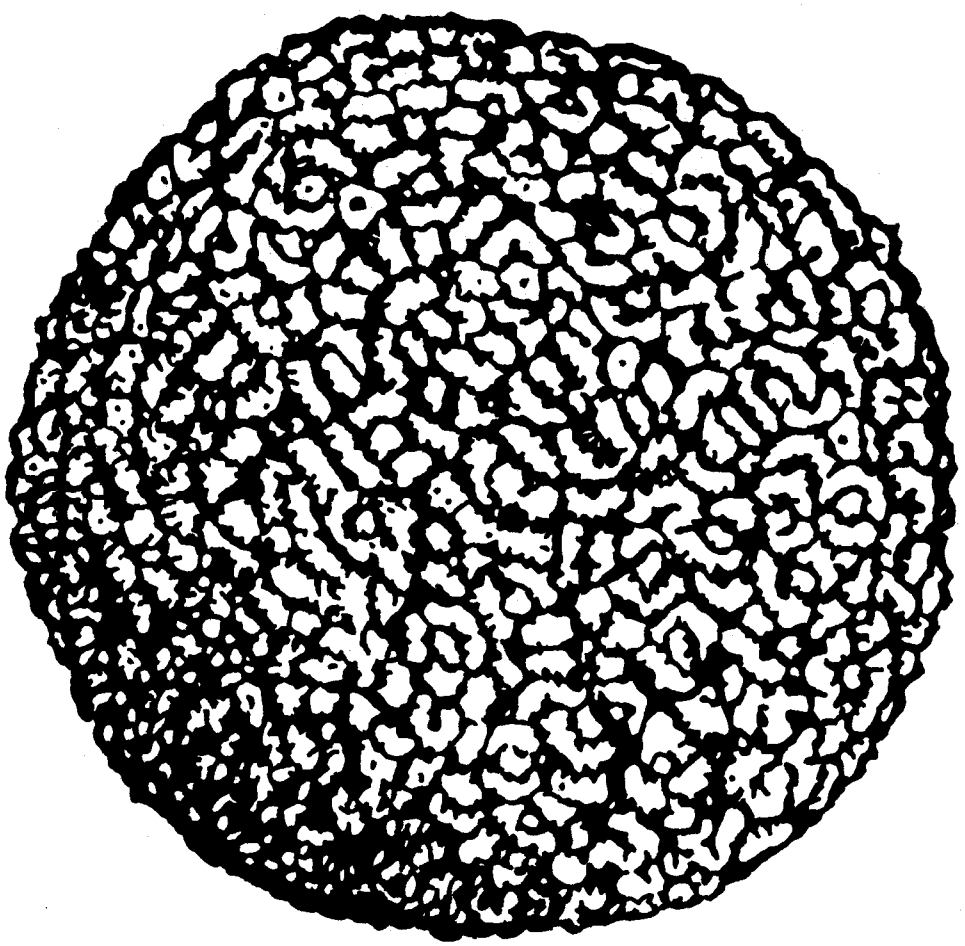
CADDOAN ARCHEOLOGY NEWSLETTER



Fruit of Bois d'Arc (*Maclura pomifera*)

Volume V, Number 2 **July, 1994**

Table of Contents

NOTE: The line drawings used in this issue were adapted from Phillip Phillips and James A. Brown (1978). *Pre-Columbian Shell Engravings from Spiro.* Peabody Museum Press.

THE EDITOR'S CORNER

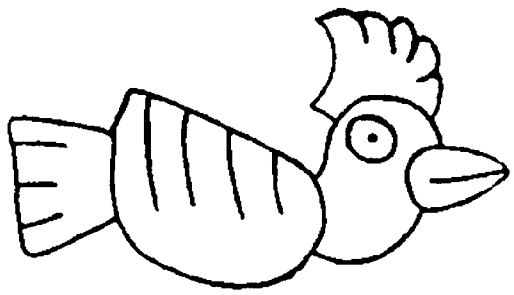
WANTED!! MANUSCRIPTS AND ARTICLES FOR THE NEWSLETTER!!!

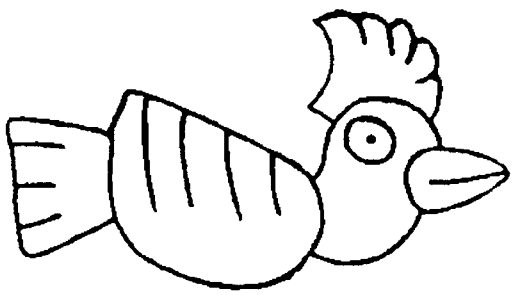
I need your input to keep the newsletter afloat. Although I have been promised a couple of manuscripts by very busy people, they have not arrived. I know that *everyone* is busy, but there must be a lot of projects out there that could yield short articles, perhaps preliminary in nature, suitable for this publication. Encourage your students to write something; this is a good avenue for breaking into print.

In addition to articles, please send in news about what has been going on in your part of the Caddoan area. Surely, a lot has been happening this summer. A paragraph or two about your current or immediately past projects is of interest to everyone, and keeps people in touch with the field. I know that you have been busy; in fact, I haven't been able to contact several people. Maybe we can make up for this in the fall issue. I'll start calling people in late September or early October for news of the area.

Short news articles, book reviews, etc., may be faxed to me at (405) 325-7604 or sent by mail. For longer articles, I would prefer to have a hard copy plus the manuscript on disk. I am currently using WordPerfect 5.1 for DOS; however, you may also send ASCII files. Computing Services has equipment for translating most standard word processing programs into WordPerfect, but this takes much more time.

Renewals for Volume 5 have been slow in reaching me. If you know someone who has not renewed their subscription, but has been intending to do so, please remind them that they won't receive another issue until their renewal arrives. Help us keep the newsletter going.





NEWS FROM THE CADDOAN REGION

LOUISIANA

At present, Jeff Girard is the only archeologist known to be doing fieldwork in Louisiana's Caddoan area, although additional work may begin in the fall. He sent the following information:

> Recent investigations conducted by Jeffrey S. Girard of Northwestern State University and Louis Baker of the Louisiana Parish, Louisiana revealed the presence of a large pit, *ca.* 1.5 m in diameter and 1.7 m deep. Recovered within the fill were one Gary point; numerous undecorated, clay-tempered sherds; and charred fragments of fish and turtle bone. The lowest 30 cm of the pit contained fired lumps of clay and charcoal. Three charcoal samples have been submitted for radiocarbon analysis. One sample yielded a conventional radiocarbon age of 2020 $\pm$ 60 BP (Beta-73340); analysis of the other two samples has not been completed. The pit is one of the few radiocarbon dated contexts relating to the Early Ceramic period in northwestern Louisiana. More work at the site is planned this fall.

OKLAHOMA

The most exciting fieldwork carried out in Oklahoma this summer was that of Dr. Lee Bement at the Cooper site in Harper County, with a grant from the National Geographic Society. Although this is in the western part of the state, this Folsom age bison kill (*Bison antiquus*) will add new information to our understanding of this Paleoindian period. The bone bed was divided into upper and lower layers, with two separate kill episodes represented in the lower bed, for a total of three. Lee, working with the Oklahoma Anthropological Society and students from the Department of Anthropology, The University of Oklahoma, recovered 32 Folsom points or point fragments, numerous resharpening flakes, and one fragment of a flake knife (from the lower bone bed). Lithic materials represented ranged from Edwards chert from central Texas to Niobrara jasper from northern Kansas or Nebraska. A preliminary estimate of bison uncovered at the site places the total number between 35 and 40. The most significant find of the season was from the lowermost kill; near the bottom of the bone bed was a bison skull with a zigzag pattern (lightning?) painted down the forehead, between the horn cores. You are certain to hear more about this important site as Lee completes his analyses.

Back in Norman, the Oklahoma Museum of Natural History (OMNH) and the Oklahoma Archeological Survey were recipients of a $75,000 grant award from the Archeological Assistance Division of the National Park Service. The grant was one of 41 funded from approximately 220 applicants. The purpose of the project is to inventory and compile documentation on Native American skeletal remains and associated funerary objects in the collections of the OMNH. This work is being conducted in compliance with the Native American Grave Protection and Repatriation Act. Julie Droke, Collections Manager for OMNH and Robert Brooks, State Archeologist, will be working closely with members of the Caddo and Wichita tribes on procedures for conducting the inventory and documentation.

At the Oklahoma Archeological Survey, staff archeologists Larry Neal and Lois Albert are completing reports on recent work in eastern Oklahoma. Larry worked at Choctaw sites from the early period of occupation in Oklahoma, and Lois did a survey in northeastern Oklahoma (Rogers and Osage counties) which emphasized locating and recording Osage historical sites.

State Archeologist Bob Brooks recently received information indicating that Historic Preservation Associates will begin work soon on data recovery at 34PS341, a site dating to Caddoan times. Also, the Bureau of Indian Affairs, Muskogee area office, has been assigned a new archeologist, Ben Barnett.

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First ARPA Conviction in Oklahoma

**by Robert W. Jobson, Jr., and Frank R. Winchell,
U.S. Army Corps of Engineers, Tulsa District**

An investigation by the Federal Bureau of Investigation and the U.S. Army Corps of Engineers, Tulsa District, resulted in the U.S. Attorney convicting a Talihina, Oklahoma man for violating the Archeological Resources Protection Act of 1979 (ARPA). This conviction was supported by the Oklahoma Department of Wildlife Conservation and the Latimer County Sheriff's Department. The investigation, which lasted more than a year, resulted in the first felony ARPA conviction in the state of Oklahoma.

ARPA states that no person may excavate, remove, damage, or otherwise alter or deface, or attempt to excavate, remove, damage, or otherwise alter or deface any archeological resource located on land owned by the United States or Indian lands unless such activity is pursuant to a permit issued under ARPA. In the case UNITED STATES OF AMERICA vs RANDALL LEON CRAIG, Craig was found guilty of excavating, removing, damaging, or otherwise altering or defacing an archeological resource located on land owned by the United States without a permit issued pursuant to ARPA.

The archeological site that Craig damaged is located near Fourche Maline Creek at Wister Lake, Latimer County, southeastern Oklahoma. The site is a contributing element to the Lake Wister Locality Archeological District listed on the National Register of Historic Places. Don Wyckoff's 1974 nomination, which successfully placed this District on the National Register, succinctly characterizes the type of site Craig damaged. This site has black midden with a low mound that looks like the *Fourche Maline phase (ca. 300 B.C. to A.D. 700)* mound sites described in Wyckoff's 1974 National Register nomination and by Galm (1981, 1984) within Wister Valley. This site and many sites like it in Wister Valley are directly or indirectly associated with the development of early horticulture in Oklahoma and the subsequent rise of the *Spiro phase (A.D. 1200 to A.D. 1400).*

Disturbed artifacts observed on the surface of the site included chert bifaces and other tools, debitage, large and small animal bone, shellfish, and ceramics. Many burned and oxidized rocks scattered across the site indicated that multiple features were destroyed as well. Ceramics observed at this site provisionally include *Williams Plain, Le Flore Plain,* and *Woodward Plain.* Based on the ceramics, this site was occupied at least from the Woodland to Mississippian period (Brown 1971; Galm 1981; Rogers *et al.* 1989; Peterson *et al.* 1993). Robert Brooks and Larry Neal examined some of the pot sherds from this site and helped in their identification. This site has not been professionally excavated, so the exact nature of the components present at the site have not been defined.

Damage to the archeological site was assessed by determining what it would cost the United States to have a professional archeologist excavate the same volume of cultural deposit Craig was convicted of destroying. This assessment includes analysis of cultural material and the production of a report. Damage caused by Craig is valued at more than $40,000, exceeding the monetary threshold of $500 that must be surpassed for Craig's actions to be classified as a felony. This assessment does not include, however, the cost of rehabilitating the site as much as possible or stabilizing the site from erosion. Craig faces a maximum of two years in prison and $20,000 in fines. As of this writing, Craig had not been sentenced. Tulsa District is taking steps to stabilize the site.

References

Brown, James A.
1971 *Pottery Vessels.* Spiro Studies, Volume 3. University of Oklahoma Research Institute, Norman.

Galm, Jerry R.
1981 *Prehistoric Cultural Adaptations in the Wister Valley, Eastern Oklahoma.* Unpublished Ph.D. dissertation, Department of Anthropology, Washington State University, Pullman.

1984 Arkansas Valley Caddoan Formative: The Wister and Fourche Maline Phases. In *Prehistory of Oklahoma*, edited by Robert E. Bell, pp. 199-219. Academic Press, New York.

Peterson, Dennis A., J. Daniel Rogers, Don G. Wyckoff, and Karen Dohm

1993 *An Archeological Survey of the Spiro Vicinity, Le Flore County, Oklahoma.* The University of Oklahoma, Oklahoma Archeological Survey, Archeological Resources Survey Report Number 37, Norman.

Rogers, J. Daniel, Don G. Wyckoff, and Dennis A. Peterson

1989 *Contributions to Spiro Archeology: Mound Excavations and Regional Perspectives*. Oklahoma Archeological Survey, Studies in Oklahoma's Past Number 16, Norman.

UPCOMING MEETINGS AND EVENTS

MEETINGS

September

23-25 *3rd Archaeology and Gender Conference: Prehistory of the Americas.* Boone, North Carolina. Contact: Cheryl Claassen, Department of Anthropology, Appalachian State University, Boone NC 28608. Email: claassencp@appstate.

October

14-16 *Science and Archaeology: Toward an Interdisciplinary Approach to Studying the Past.* Sponsored by the Society for Archaeological Sciences. Cambridge MA. Oral papers will emphasize the nature of interdisciplinary/multidisciplinary research, rather than detailing the results of a particular analytical technique or research project. Poster presentations will deal with any aspect of archeological science. Contact: Robert H. Tykot, Archaeometry Laboratories, Harvard University, Cambridge MA 02138. Telephone: (617) 496-8991. Fax: (617) 495-8925. E-mail: Tykot@HUSC4.Harvard.Edu.

22-24 The Textile Society of America will hold its fourth biennial symposium at the Fowler Museum of Cultural History, at the University of California of California - Los Angeles. The theme will be "Contact, Crossover, Continuity". Papers will address textiles which have been subjected to outside influence, and which continue in an altered form. For more information, contact Louise W. Mackie, Textile Department, Royal Ontario Museum, 100 Queen's Park, Toronto Ontario, M5S2C6, Canada. Telephone: (416) 586-8055.

November

2-4 *American Association of Stratigraphic Palynologists, Annual Meeting.* College Station, Texas. Technical sessions will be held on the 2nd and 4th, with a one-day symposium on the 3rd, entitled "Good and Bad Procedures for Collecting, Processing and Analyzing Palynomorphs". This symposium will focus on both pre-Quaternary and Recent age materials. A one-day workshop, "Palynology in the 1990s and Beyond", will be held Saturday, November 5. For further information, contact Dr. Vaughn M. Bryant, Jr., Department of Anthropology, Texas A&M University, College Station TX 77843-4352. Telephone: (409) 845-9334/5242; Fax: (409) 845-4070.

9-12 *The Southeastern Archaeological Conference* and *Midwest Archaeological Conference* joint meeting. Radisson

Plaza Hotel, Lexington KY. Keynote speaker: Dr. Alison Wylie. Contact: SEAC/MAC Committee, 101 American Bldg., University of Kentucky, Lexington KY 40506-0100. Telephone: (606) 257-1944; fax: (606) 323-1968.

10-13 *American Society for Ethnohistory Annual Meeting*. Tempe AZ. Contact: Peter Iverson, Department of History, Arizona State University, Tempe AZ 85287-2501. Telephone: (602) 965-5778; fax: (602) 965-0310.

30-December 2

American Anthropological Association, Annual Meeting. Atlanta GA. This meeting includes a symposium on isotopic and elemental analyses of bone, organized by Robert H. Tykot. Contact: AAA, 1703 NW New Hampshire Avenue, Washington DC 20009. Telephone: (202) 232-8800.

1995

April

2-7 *Archaeological Chemistry Symposium, American Chemical Society National Meeting*; sponsored by the subdivision of Archaeological Chemistry, Division of the History of Chemistry, ACS. Anaheim CA. Contact: Mary Virginia Orna, Department of New Rochelle, New Rochelle NY 10805. Telephone (914) 654-5302; fax: (914) 654-5387.

May

3-5 *The Society for American Archaeology Annual Meeting*. Hilton Hotel, Minneapolis MN. Program committee chair: Dr. Paul Minnis, Department of Anthropology, The University of Oklahoma, Norman OK 73019. Contact: SAA Office, 900 Second Street NE, Suite #12, Washington DC 20002.

24-28 *7th North American Fur Trade Conference*. Halifax, Nova Scotia, Canada. Although previous conferences have focused on the fur trade before 1950, this conference plans to offer sessions which will bring the study of the fur trade into the 20th century. Papers are invited from researchers interested in areas such as Native Studies, Women's Studies, Ecology and the Sciences, Comparative Studies, History, Anthropology, Literature, etc., that explore European and Asian connections, mink and fox farming, conservation, animal population, women's roles, literary perspectives, etc. There will be a special session of papers related to the eastern Atlantic region. Contact: Barry Moody or Bill Wicken, Gorsebrook Research Institute for Atlantic Canada, Saint Mary's University, Halifax, Nova Scotia Canada B3H 3C3. Telephone: (902) 420-5668; Fax: (902) 420-5530; E-Mail: BWicken@Husky1.StMarys.CA

EXHIBITS AND OTHER EVENTS

Current

Oklahoma State Museum of History. Exhibit on hunting and fishing in Oklahoma from prehistoric time to the present. The Deer Creek site in north central Oklahoma is the focus of the exhibit. In the Native American Gallery is the long term exhibit which gives an overview of Oklahoma prehistory, focusing on the Spiro site. New exhibits are planned for this fall, but at present their titles have not been decided. Contact: State Museum of History, 2100 Lincoln Blvd, Oklahoma City, OK 73105. Telephone: (405) 521-2491.

AVOCATIONAL TRAINING PROGRAMS, SEMINARS, AND DIGS

Missouri Archeological Society

Contact: Melody Galen, Missouri Archeological Society, PO Box 958, Columbia MO 65202. Telephone: (314) 882-3544.

Arkansas Archeological Society

Contact: Russell G. Scheibel or Hester A. Davis. Arkansas Archeological Society, PO Box 1222, Fayetteville AR 72702-1222, Telephone (501) 575-3556.

Oklahoma Anthropological Society

OAS Certification Program. Cost: $10 plus OAS membership ($15). Seminars are scheduled throughout the year as well as at digs. For information contact: Lois E. Albert, Chair, Certification Council, Oklahoma Archeological Survey, 111 E. Chesapeake, The University of Oklahoma, Norman OK 73019. Seminars scheduled during the next several months include: General Survey Techniques (September 17); Specialized Techniques: Soils (October 29); Archeological Research Design (November 19); Lithic Technology and Analysis (December 3); Organic Remains Analysis: Animal Remains (February 4, 1995); Archeological Photography will be scheduled for later in the spring. In order to enroll in these seminars you must be a member of the Oklahoma Anthropological Society. Preference for enrollment in classes with limited enrollment will be given to those enrolled in the Certification Program.

THE ORIGINAL DISTRIBUTION OF BOIS D'ARC. PART I: TEXAS

by
David H. Jurney
Mercyhurst College, DeSoto, Texas

Early historical explorations of the American frontier discuss many tree species and their uses, yet rarely mention bois d'arc (*Maclura pomifera*). Several important early expeditions sent by President Thomas Jefferson into the southwestern frontier provide the first evidence for the natural and culturally influenced range of the species. Bois d'arc was important in the trade of Native Americans, specifically used for bow wood.

As early as 1804, John Sibley and Merriwether Lewis reported to President Jefferson about bois d'arc, drawing on information derived from transplanted saplings and reporting that the source was *ca.* 300 miles away (i.e., along the Red River?; see Flores 1985:114). John Sibley, a temporary United States Indian Agent along the Red River in the early nineteenth century, reported a source of bois d'arc wooden bows among the Caddos of the Red River. With these bows they conducted a lively trade among Plains and southeastern Indian groups (Gregory 1973; Webb and Gregory 1978).

The Dunbar and Hunter Expedition along the Ouachita River in 1804-1805 was the first known scientific documentation of bois d'arc on the North American landscape. Their observations and collections were of trees apparently transplanted from more distant sources, as reported by their guides (McDermott 1963). On 20 November 1804, during discussion of potential and actual uses of various plants for dyes, McDermott (1963:94) states that "at this point in his official report (p.34) Hunter wrote:

> This brings to recollection a tree called Bois d'Arc (Bow wood) being very elastic and used by the Indians to make their bows. It is more frequently called Bois jaune (Yellow Wood) used by them and the inhabitants as a dye.
>
> This tree resembles the Orange, grows about 15 feet high, bears a yellow fruit in appearance somewhat between a Shaddock & a large orange with a rough yellow skin, & in the inside, seeds in divisions of a pulpy substance resembling the orange tho not so juicy. It is deciduous, grows in abundance on the Red River and on the banks of the little Missouri, a principal branch of the Ouachita. It will grow in the middle and southern states." (McDermott 1963:94).

"Bois d'Arc (Bow-wood) or yellow wood said to resemble fustic: it is extremely elastic, and used by the Indians for bows and arrows, from whence it derives its name. This is a very handsome ornamental tree; its foliage possesses the brilliancy of that of the orange tree, which it greatly resembles in summer, but it is not an evergreen. It grows to the size of a foot or more in diameter; its flowers are said to be white and are followed by a fruit which grows to the magnitude of an Ostrige's (*sic*) egg and nearly the colour and brilliancy of pale gold; the bark of the tree is also yellowish and scaly in the manner of the dogwood bark: its branches are numerous crossing each other and armed with short strong thorns; it would probably make beautiful strong and durable hedges. The fruit contains many seeds resembling, but larger than, those of the orange, but without any pulp or juices: I have seen one of the trees six inches in diameter, from which I procured some[s] Cions and cuttings with the view of propagating the tree. Some imperfect attempts have been made to dye with it; it is expected that it may furnish a yellow [The yellow dye is soluble, and readily available (Brown and Panshin 1940:471-472)]; upon the whole this tree may be expected to be a great acquisition being highly ornamental, and perhaps may serve as a stock, upon which to graft the orange, lemon, & c" (McDermott 1963:121).

On 11 January 1805, returning down the Ouachita, Hunter reports:

> "Our pilot informs us that about 26 leagues up the little Missouri at the Fork of Antoine [i.e., juncture of Pike, Clark, and Nevada counties, Arkansas] on the lower and [word illegible] side upon a bayou that runs up to the hills... 5 leagues above the fork Antoine are to be seen many trees called Bois jaune or Bois d'Arc (yellow-wood) or Bow wood, which grow about 15 or 20 feet high... The wood is of a reddish orange colour, & gives a fine yellow dye; this tree resembles the chinquapin tree in external appearance, bears in the fall a fruit resembling an Orange but twice as large filled with seeds, this tree has a very knotty scrubby appearance.
>
> Perhaps it is the famous tree which yields the yellow dye [held] in so much in esteem in Europe & reckoned so valuable and rare, capable of dying the finest scarlet - Mr. Le Fevre gave the same account of this tree" — (McDermott 1963:111).

M. Le Fevre was another acquaintance on the trail below Fort Miro, who, in party with ten Indian hunters, reported that a party of Osages from the Arkansas River settlements had killed ten Cherokees (McDermott 1963:110). On 24 January 1805 the same is mentioned — "Mr. Dunbar has received (20 January) a few cuttings, suckers & seed balls or fruit of the famous yellow dying (*sic*) tree from the little Missouri which had been transplanted on the Ouachita at the last settlement" (McDermott 1963:114). This settlement with transplanted bois d'arc is estimated to have been *ca.* 20 leagues upstream from Fort Miro, therefore the northeasternmost of the original distribution of transplanted trees.

Peter Custis provided the first published scientific description of bois d'arc in 1806 (Flores 1984:260). Custis observed a transplanted bois d'arc tree, 30 ft high and a 7-8 ft circumference (*ca.* 2.5 ft diameter), within one mile of Natchitoches, Louisiana, the southeasternmost observation of transplanted bois d'arc on the Red River. Custis returned the fruit by preserving it in whiskey and sent attached samples of branches and twigs, but could not name it as a new species because it was not in flower. Custis observed the first native trees above the "second" Little River (i.e., Kiamichi?), tributary to the Red River in today's southeastern Oklahoma. He reported that the major source was a tributary stream farther up the Red River called Bois d'Arc; and attributed all occurrences east of this area to transplanted trees around old Caddo villages (Flores 1984:261, 1985:114). Unfortunately, streams of this name are known from both sides of the Red River.

Anthony Glass, traveling overland from Natchitoches to the Wichita villages on the upper Red River in 1807, first observed extensive stands of native (?) bois d'arc, helping to fix the potential original range. The first record was of large quantities on two creeks (e.g., Auds Creek, Hickory Creek and its head Chick Creek) in Lamar County, Texas (Flores 1985:114). Beyond this was Bois d'Arc Creek with the most extensive stands of bois d'arc in Fannin County, reportedly a favorite beaver stream used by French trappers (Flores 1985:114). Glass described bois d'arc as "the most elastic wood in the world" and described the use of it for bows by Wichitas (i.e., Tayovas), where arrows were "propelled completely through bison," or even war captives (Flores 1985:60). On the basis of these descriptions, Flores (1985:114) states that the native distribution of bois d'arc centered on a 200 mile zone north and south of the Red River, from the blackland prairie to the western crosstimbers of Texas and Oklahoma. This area appears to have been an ideal ecological setting for the native tree — interfingered riparian forests of the blackland prairie.

BOIS D'ARC ECOLOGY

General Land Office Surveys

The original United States land surveyors kept records and notes which provide a range of information pertaining to the natural environment and cultural history of the radiating American Frontier. The United States Congress established a rectangular grid survey system for the sale of Public Domain by the General Land Office in 1785. This created a series of Townships generally six miles long on each side, subdivided into 36 one-mile square sections to cover the Public Domain confiscated from the Indians. Township and section corners were marked, from which two to four bearing (i.e., witness) trees were noted and blazed, legal landmarks for the establishment

of the corners' provenance. The common species names of these trees were recorded, along with their diameters, directions, and distances from said mark. Line trees at *ca.* 1/4 mile intervals were also blazed and recorded. In 1956, Bourdo published a careful review of the potential uses of rectangular land surveys for the quantification of vegetation. In the review, he noted particular sources of bias and potential error or fraud that should be guarded against (Bourdo 1956:757). Subsequently, botanists have successfully performed reconstructions of soil and plant relationships in presettlement forests (Hushen, Kapp, and Bogue 1966:197) and mapped the invasion of some tree species following settlement (Wuenscher and Valuinas 1967:494). Exhaustive treatments and critiques of General Land Office vegetation reconstructions can be found in Sears (1921, 1925), Howell and Kucera (1956), Zawacki and Hausfater (1969), Wood (1976), King (1978), and Warren (1982). Detailed discussion of statistical applications using rectangular grid sampling is less relevant here, because the Texas GLO data for bois d'arc are derived from the "metes and bounds" land surveying system.

The first United States Public Domain surveyed was in the Ohio Valley, continuing in a wave-like fashion as the frontier moved westward into Indiana, Illinois, and beyond (Matousek 1971:2). Surveys in the Indian Territory (e.g., Oklahoma) were divided into several periods, with some 1830s and 1840s Indian Boundary surveys. The Chickasaw Cession was surveyed in the 1870s, and northern and central portions of the state were run by quarters before the land runs of 1889 and 1893. Most subdivisional surveys began in the 1890s.

Texas contained some rectangular land surveys (e.g., Peters Colony, northern Texas); however, the township and range meridians were not preserved, and all records were destroyed (Connor 1959). The granting and sale of the Texas Public Domain operated in a wave-like fashion, with land in the earliest settlements (i.e., Spanish and Mexican grants) first to be surveyed in the late part of the 18th century and early part of the 19th century. However, a quite different land system, based on metes and bounds and measured in the "Spanish" vara (1 vara = 33 $^{1}/_{3}$ inches, 1 vara = 0.84667 meters, with historical variations across the Old and New Worlds), was employed in Texas.

Spanish colonial laws for North America during the 1700s were designed to provide land only to Spanish citizens. Some Americans began to take advantage of this policy by immigrating into Spanish territory. For instance, Moses Austin immigrated into Spanish Louisiana (i.e., today's Missouri) in 1797, renounced his American citizenship, developed a strong relationship with Spanish colonial authorities, and acquired an Empresario contract to settle Texas (Haley 1985:9). This land allocation system allowed the empresario to charge fees from settlers, while still obtaining land in compensation for encouraging their settlement. Other Americans, including surveyors trained in the United States, began to enter into entrepreneurial relationships with Spanish authorities.

Following the Mexican Revolution in 1821, Moses and Stephen Austin gained the opportunity to persuade the new Mexican government to allow the previously planned settlement. A new colonization law was subsequently approved in 1823; each settler received a maximum of a league (4428 acres) for ranching and a labor (177 acres) for cultivation (Blucher 1940:18-19; Haley 1985:17). Approximately 9248 American families settled in Texas prior to its revolution, through Empresarios such as Stephen Austin, Green DeWitt, Hayden Edwards, Benjamin R. Milam, Joseph Vehlin, David G. Burnett, John Cameron, and Lorenzo de Zavala (McKittrick 1918; Shine 1969:14).

Following the Texas Revolution in 1835-1836, the new government had no tax or credit systems and depended solely on land to fund its burgeoning Republic. The Republic of Texas codified a variant of the Spanish and rectangular land systems in 1836, gradually reducing the size of land grants as demands on land increased (Blucher 1940:20-21; Rounds 1941:28-31; Shine 1969:14; McKittrick 1918). From *ca.* 1838-1850, surveyors and land entrepreneurs began to lay out tracts in selected areas beyond those already granted and secured. Land was subdivided and sold in advance of the actual settlement. Recipients of land grants still had the option of requesting equal division of select riverine or lacustrine frontages, and land surveying focused on the rapid mapping of select land tracts. As settlement density increased (ca. 1850-1870), remaining unclaimed lands were surveyed, filling in odd spaces among earlier grants.

Despite the different sizes and shapes of the Texas General Land Office Surveys, at each land tract corner the surveyors still recorded and marked "witness" trees, noting the species, cardinal direction, distance (in varas), and diameter (in inches); they also noted that they "raised a mound" to mark legal provenance in prairie areas (Tharp 1940, 1941). Occasionally, the surveyors marked or noted line trees and summarized the quality of land and composition of the understory vegetation. However, not all surveyors recorded all information at every corner, occasionally leaving gaps; and there is a potential for selective bias or fraud on the part of the surveyor. However, by examining many surveys conducted by several individuals over substantial areas (i.e., county or drainage basin), selective individual biases may be minimized, providing a more representative characterization of vegetation communities. However, spatially meaningful indices are not as robust as those which use United States rectangular land survey data (Bourdo 1956:757).

Broad scale vegetation reconstructions in Texas using metes and bounds data have been provided by Jordan (1973) and Weniger (1984), but are generally not pinpointed to specific land tracts; instead witness tree observations are grouped into vegetation communities with arbitrarily defined boundary zones. Schafale and Harcombe (1983) have performed an extensive statistical vegetation reconstruction for Hardin County, Texas. This latter study reveals the potential for developing quantified descriptions of the presettlement forests (i.e., macro- and micro-community levels), and even in some cases prairies, of Texas.

General Land Office data have been employed to provide detailed maps of original plant distributions at the county and project specific levels in Texas (Jurney 1987, 1988a, 1988b; Jurney, Winchell, and Moir 1989; Moir, McGregor, and Jurney 1994). The Direct Gradient (Bourdo 1956) method is employed in this type of vegetation reconstruction. The Texas GLO patent plats are photocomposited with USGS 7.5' quadrangles and soil maps (if available). Original maps are cross-referenced, plotting GLO boundaries on corresponding USGS or soil aerial maps. This process allows direct comparison of soil types, slope, exposure, and drainage settings; these are all used to establish vegetation "boundaries" (Jurney 1987). All land tracts were examined in project-specific areas (i.e., reservoir or federal grasslands). Surrounding these project areas, alternate land tracts were selected in a checkerboard-fashion to encompass one or more counties. Unfortunately, we couldn't examine all surveys without great expenditure of time and effort.

The available GLO matrix for this study consists of a total of 759 patents, distributed among four major projects; Richland/Chambers Reservoir (145 patents in Navarro, Freestone, Anderson, and Henderson counties), Joe Pool Lake and greater Dallas metropolitan area (494 patents in Dallas, Tarrant, and Ellis counties), the U.S. Forest Service's Caddo and L. B. Johnson Grasslands (42 patents in Fannin County and 40 patents in Wise County), and Cooper Lake (38 patents in Delta and Hopkins counties). This data base consists of 4804 trees observed from 2468 land corners, with only 740 corners falling in prairie areas where no trees were within visual limits for witness trees. Some surveyors apparently sighted for greater distances in prairie areas to provide witness for the mounds they were erecting.

No bois d'arc witness trees were observed in the GLO sample from Anderson, Henderson, Ellis, Freestone, Navarro, Tarrant, and Wise counties. Cursory examinations of GLO patents on Fort Hood, in Bell and Coryell counties, also located along the blackland prairie in central Texas, have not yielded any observations of bois d'arc on the original land surveys either (Jennifer Stabler, Fort Hood Archaeological Section, personal communication 1994). Counties where named streams or witness tree observations were documented in the GLO notes include Dallas (only along the eastern boundary), Delta, Hopkins, Fannin, Kaufman, Lamar, Red River, and Rockwall. The southern boundary appears to have been southeastern Dallas and southwestern Kaufman counties, or some point down the Trinity River channel. This appears to have been the southern limit of this species, and is more clearly demarcated than the general distribution reported in contemporary historical accounts (Roberts 1881).

All original GLO notes relating to observations of bois d'arc witness trees, or even mention of bois d'arc as a stream name, were re-examined for this analysis. The GLO sample of witness trees includes 38 observations of individual bois d'arc trees, out of a total of 4804 witness trees (0.8%). Thirty-two witness trees, five corner trees, and one line tree were recorded as bois d'arc. Ecological observations of these trees, their diameters, distances, and soil associations are presented below.

Diameter Classes

Twelve sizes of trees were observed in this sample, ranging from 2 to 30 inches in diameter. The most common size classes (in inches) were 10 (n=5), 24 (n=3), and 12 (n=3), followed by 30 (n=2), 8 (n=2), 6 (n=2), 4 (n=2), and 3 (n=2). Single observations were made of 18, 13, 7, and 2 inch size classes. This broad range of tree size classes indicates a normal population of trees (Bourdo 1956).

The mean bois d'arc stem diameter was 11.65 inches. Tree size does not necessarily correlate with age. A common assumption expressed when people observe trees is that a large tree must be an old tree, and that all virgin timber must be large trees. The GLO notes clearly indicate a range from saplings to large trees. Dendrochronological observations of wooden elements in historic buildings across eastern and central Texas indicate that bois d'arc never exceeded 100 years in age, although they may attain large diameters. All bois d'arc construction elements used in those historic buildings that have been examined across Texas date to the late nineteenth and twentieth centuries.

Densities

The distances that were recorded by surveyors from each land tract corner to its respective witness trees provide a rough measure of the spatial aggregation of trees. These distances were recorded in varas (1 vara = 33 $^{1}/_{3}$ inches, or 0.84667 meters) from the point of observation (e.g., legal land tract corner). In the Texas GLO notes, the Spanish vara was used for dispersion, and the English system for the tree diameters. One observation on the East Fork of the Trinity river noted a bois d'arc witness at 250 varas (211.7 m) "across a lake," and another at 110 varas (93.1 m) across a prairie near a "trace." The recorded distances for the remaining trees are 36, 15, 14, 11, 10, 9, 8, 7, 6, 5, 4 (3), 3, 2 (4), and 1 vara, with five bois d'arc corner trees, and one line tree.

Commensurate Species and Ecology

Other trees often observed in GLO patents where bois d'arc is recorded provide more information on the ecological setting. Prominent among these are elm, ash, hackberry, red oak, bur oak, cottonwood, and water oak. Other species less commonly associated include post oak, blackjack oak, hickory, box alder (*sic*), overcup oak, pecan, mesquite, and honey locust.

One bois d'arc tree on Bois d'Arc Creek in Fannin County was described as "washed down in a sluice." One on the East Fork of the Trinity River in Kaufman County was described as "leaning." Many observations along the East Fork of the Trinity River — under today's Lake Ray Hubbard — indicate vast bodies of water, bottomland prairies, and inundated settings.

Soil Associations

Six clay soil types (e.g., Catalpa, Frio, Kaufman, Miller, Nahatche, and Trinity) and a loamy soil (e.g., Crockett) are associated with these observed bois d'arc trees. All soils but one (e.g., Crockett) are frequently to occasionally flooded floodplain soils. The frequently flooded phase of the Trinity clay contained 52.6% of the observed bois d'arc, primarily located along the East Fork of the Trinity River in eastern Dallas, western Kaufman, and western Rockwall counties, and the South Sulphur River in northern Hopkins and southern Delta counties.

The frequently flooded phase of the Kaufman clay along the South Sulphur River with 10.5% and the frequently flooded Catalpa clay along Bois d'Arc Creek in Fannin County with 7.9% comprise the second most adaptive soils for bois d'arc. The frequently flooded Frio silty clay (5.3%), occasionally flooded Trinity clay (5.3%), occasionally flooded Kaufman clay (5.3%), and Miller clay (5.3%) soils comprise the third most adaptive soils. Of these soils, the Miller clay is formed strictly in Red River alluvium. Finally, the frequently flooded Nahatche (2.6%), high bottom phase of the Catalpa clay (2.6%), and Crockett loam (2.6%) soils round out those associated with bois d'arc. The Crockett is an upland soil, which was probably not suitable for the sprouting ecology of bois d'arc. Since the single occurrence on this soil was observed along the Caddo Trace southeast of Paris, Texas (Flores 1985:114), this occurrence may have been a transplanted tree.

CONCLUSIONS

According to extensive, and admittedly incomplete, sampling of Texas GLO records, bois d'arc was located in three major areas:

(1) along the East Fork of the Trinity River and one tributary, Rowlett Creek, in Dallas, Kaufman, and Rockwall counties;

(2) along the North Fork Sulphur River and its tributaries Auds and Hickory creeks in Lamar County and the South Sulphur River in northern Hopkins and Delta counties; and

(3) Bois D'Arc Creek, a tributary of the Red River in Fannin and Lamar counties, Texas.

There were no occurrences noted in original surveys west of the Trinity River, in western Dallas, Ellis, Tarrant, or Wise counties, in what has been defined as the eastern and western crosstimbers of Texas. There were no occurrences noted in any surveys along the Trinity River to the south in Navarro, Freestone, Anderson, or Henderson counties.

The ecology of native bois d'arc required frequently flooded to occasionally flooded environmental settings. Thus, the tree's seeds, encased in large fruits, were distributed by water along high water margins. The tree thus would have normally redistributed itself only downstream. There may have been a co-adaptation with beaver-inundated river basins, which may have limited the distribution above primary beaver dams.

Preliminary investigations of the Oklahoma General Land Office surveys, housed at the State Library in Oklahoma City, suggest that significant temporal information may be available on the distribution of bois d'arc. Boundary, meridian, and township surveys appear to have been conducted prior to sectional surveys, potentially providing data on native range as well as transplantation. The species has been noted in Bryan County, and a future paper is planned on this subject, as Part II, which will include occurrences in Oklahoma.

ACKNOWLEDGEMENTS

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BOOK REVIEW

A Naturalist in Indian Territory: The Journals of S. W. Woodhouse, 1849-1850, edited and annotated by John S. Tomer and Michael J. Broadhead. Norman: The University of Oklahoma Press. 304 pages, notes, appendix, bibliography, index. Hard cover edition 1992. Volume 72 in The American Exploration and Travel Series.

Samuel Washington Woodhouse, a Philadelphia physician and avid ornithologist, was appointed surgeon-naturalist of two expeditions to survey the Creek-Cherokee boundary in Indian Territory. The Creek boundary expedition that Woodhouse was asked to join was a Corps of Topographical Engineers survey party sent to survey and mark the northern and western boundaries of the Creek Indian lands in Indian Territory to comply with the requirements of the Creek Treaty of 1845. The usual purpose of these surveys was to map the land, describe its topography, and learn about its native inhabitants. Later objectives were to establish roads and to set boundaries as the westward movement of settlers began, in addition to observing and gathering specimens of the animals, plants, and minerals of the West. Woodhouse served on both expeditions of the survey, the first in 1849 under Capt. Lorenzo Sitgreaves and the second under Lt. Israel Carle Woodruff in 1850.

While traveling, Woodhouse filled three journals with his impressions and observations of the people he encountered, and of the specimens he collected for the Smithsonian Institution, National Museum of Natural History. The first diary, now in the Historical Society of Pennsylvania archives, covers the period from April 26 through June 19, 1849. The second and third diaries are both now in the library of the Academy of Natural Sciences of Philadelphia. The second journal contains entries from June 20 through December 29, 1849; the third continues from June 12 through October 8, 1850.

Until the publication of this book, Woodhouse's early work as a professional naturalist in Indian Territory has been little noticed and seldom cited in literature. The editors explain that this deficit is a result partly of the paucity of notice in the literature of the Creek Indian boundary survey itself. His later work is best known from his natural history report in Lorenzo Sitgreave's *Report of an Expedition Down the Zuni and Colorado Rivers.*

The editors of this book have done an impressive job of researching and compiling the information necessary to write the introduction and the notes which accompany the journals. The detailed introduction and clarifying notes reveal that Woodhouse was very bad at spelling, grammar, and punctuation. He also seems to have misidentified almost every specimen he collected. But aside from these small problems, the end notes provide an excellent explanation of the things and people Woodhouse talks about, including exact locations of where the expedition camped, complete with section, township, and range. Maps, pictures, and actual sketches Woodhouse made in the journals are scattered throughout the book and explained in detail by the editors.

John S. Tomer is a Research Associate at the Oklahoma Museum of Natural History, an experienced ornithologist, and the author of many articles on Oklahoma birds. Michael J. Brodhead is a Professor of History at the University of Nevada, Reno, and a specialist on the exploration of the American West and the study of its natural history. These two editors make this book a must for anyone interested in the early historic environment of the American West and in the Native American condition on the 19th century American frontier.

Reviewed by Barbara Keener

NOTE: This book won two awards for the year 1993. They are the (1) Choice Outstanding Academic Book Award of 1993 presented by *Choice Magazine*, and (2) Best Book in Oklahoma History for 1993 given by the Oklahoma Historical Society.

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This bulletin is the first of two focused on a single subject:

THE CALF CREEK HORIZON IN OKLAHOMA

Bulletin Number 40 covers the Osage Savannah zone;

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Papers included in Bulletin Number 40 are: ***Introduction to the 1991 Bulletin*** (Don G. Wyckoff); ***The Calf Creek Horizon in the Osage Savannah*** (Don G. Wyckoff); ***The Primrose Site, 34MR65, Murray County, Oklahoma*** (Don G. Wyckoff, William L. Neal, and Marjorie Duncan); ***The Calf Creek Component at the Stilman Pit Site (34MR71) and its Relation to Calf Creek Caching Strategy*** (Robert Bartlett); ***The Williams' Orchard Site: An Analysis of Lithic Procurement*** (Marjorie Duncan); ***The Hester/Adams Site: 34ML83, McClain County, Oklahoma*** (Gregg C. Cestaro and Monica H. Carrell); ***The Frazier Site: A Calf Creek-Bison Association in the Southern Osage Plains, South-Central Oklahoma*** (Towana Spivey, Frosty Freese, and Don G. Wyckoff); ***A Calf Creek Component from the Lamar Site, 34BR8, Bryan County*** (Larry Neal); ***Surface Collections of Calf Creek Materials from Cleveland, Marshall, Oklahoma, and Stephens Counties, Oklahoma*** (David F. Morgan); ***Calf Creek Bifaces and Middle Archaic Occupations in the Bellcow Creek Drainage, Central Oklahoma*** (Jeff Girard and Helen Sorayya Carr); ***The Brandon Site, 34TU82, Tulsa County, Oklahoma*** (Larry Neal); ***Calf Creek Points from Eastern Oklahoma in the Bullard Collection*** (Francie Gettys); ***The McKellips Site: An Analysis of the Calf Creek Component*** (Marjorie Duncan and Don G. Wyckoff); ***The Red Clay and Island Locations in Haskell County: Eastern Oklahoma Manifestations of the Calf Creek Horizon*** (Larry Neal, Dave Morgan, Billy Ross, and Don G. Wyckoff); ***Calf Creek on the Cherokee Prairie, Part I: The Arrowhead Ditch Site (34MS174)*** (Don G. Wyckoff, David Morgan, and Lee Woodard); ***Calf Creek on the Cherokee Prairie, Part II: The Woodard-Benefield Site (34MS258)*** (Don Shockey, Paul Benefield, and Don G. Wyckoff); ***Some Preliminary Conclusions about the Calf Creek Horizon in the Osage Savannah*** (Don G. Wyckoff and Larry Neal).

To order this publication, contact Pete Thurmond, Secretary-Treasurer, Oklahoma Anthropological Society, Rt 1 Box 62B, Cheyenne OK 73628. The cost of the volume is $15.00.

HOT OFF THE PRESS!!

THE FALL 1994 BOOK CATALOG FROM THE UNIVERSITY OF OKLAHOMA PRESS

I have just received the new book catalog in the mail. There were several books listed which may be of interest to people working in the Caddoan region. These are listed below:

Historical Atlas of Louisiana (available in November), by Charles Robert Goins and John Michael Caldwell. 240 pages, 99 pages of maps (7 in full color, 92 in two colors). ISBN:0-8061-2589-6 (cloth), $65.00; ISBN:0-8061-2682-5 (paper) $29.95.

Historical Atlas of Oklahoma, by John W. Morris, Charles R. Goins, and Edwin C. McReynolds. 206 pages, 83 color and B/W maps. ISBN:0-8061-1991-8 (cloth) $32.95; ISBN:0-8061-2001-0 (paper) $18.95.

Historical Atlas of Texas, by A. Ray Stephens and William M. Holmes. 160 pages, 64 maps. ISBN:0-8061-2158-0 (cloth) $24.95; ISBN:0-8061-2307-9 (paper) $18.95.

Historical Atlas of Arkansas, by Gerald T. Hanson and Carl H. Moneyhon. 256 pages, 113 color and B/W maps. ISBN:0-8061-2480-6 (paper) $19.94.

The Story of Oklahoma, by W. David Baird and Danney Goble. 528 pages, 215 illustrations, 23 maps. ISBN:0-8061-2650-7 (cloth) $28.95.

Bone Game, by Louis Owens (available in October). This is a mystery novel by a Native American (Choctaw-Cherokee-Irish) author. It is set in California with a Choctaw principal character. ISBN:0-8061-2664-7 (cloth) $19.95. [Other novels and literary critiques by Native American writers are listed in the catalog.]

O Brave New Words! Native American Loanwords in Current English (available in September), by Charles L. Cutler. ISBN:0-8061-2655-8 (cloth) $24.95.

To order any of these books from the OU Press (credit card customers), call toll-free between 7:30 am to 6:30 pm: 1-800-627-7377. Some booksellers may also carry these publications. To order by mail, write to: University of Oklahoma Press, PO Box 787, Norman OK 73070-0787. Postage and handling for US orders: $2.50 for the first book, and $0.50 for each additional book. A general catalog of all OU Press books in print is also available.

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