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and coriander to make sauces for the stews or to eat on beans or tortillas. Rice has been bought by the Otomies at the weekly market in Ixmiquilpan for many years and recently some have begun to buy various forms of pasta to prepare with the same sauces. Often the family's supply of corn and beans does not last until the next harvest and additional corn and beans must be bought.

Although the Otomies depend upon the environment for other materials (houses are constructed of stone, organ pipe cactus and *maguay* provide thatch, and fibers from *magueyes* and *lechugillas* are woven into items of clothing, for example), it is in the exploitation of the environment for foodstuff that the greatest amount of time is spent. Much of the day is spent by the family members in collecting, producing and preparing food and drink. Hence this one response to the environment controls the organization of daily life, the division of labor and the routine of the seasons. Ultimately it affects settlement and residence patterns, inheritance rules and the law and judgements concerning land and gathering rights — in short, the entire political arrangement of villages.

Otomi culture, considered apart from the environment in which it operates might be seen as a backwards, tradition-bound culture, stubbornly resisting change.

When viewed as a patterned response to a harsh environment and technical limitations, it appears to be an efficient utilization of the available resources.

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Historical Archaeology In Arkansas

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Any discussion of historical archaeology today must begin with a treatment of the definition of the term "historical archaeology" and of the scope of the problems and goals of this field. A detailed discussion of this sort is beyond the range of the present paper and is dealt with at length elsewhere (Dollar 1969; Jelks 1968; Schuyler 1970; South 1967, 1968; Walker 1968), so I hope to present merely a brief outline of the definition, problems, and goals of historical archaeology and to introduce you to some of the work that is presently being done in Arkansas.

Historical archaeology has "come of age" in this country only in the last few years and as such has not yet built up a comprehensive and generally accepted body of method and theory. In general, however, we can say

that historical archaeology is a combination of the excavation techniques of field archaeology with some of the theoretical methods and assumptions of anthropology and history in order to present a thorough interpretation of sites occupied during the historic period. This is to say that we, ideally at least, not only retrieve information from the ground in the form of artifacts and features, but also use historical documents to identify these artifacts and features and use the theoretical background of anthropology to relate our findings to broader areas of social interaction, such as the evolution of technology, trade, and settlement patterns. These sorts of activities can be used to achieve a wide variety of ends, among them guidance for restoration, reconstruction, or furnishing of significant historic structures, added insights

for written history, and location and identification of sites of known historical significance, such as buildings associated with prominent persons or events. Of primary importance, however, is the contribution that each collection of data makes to the general pool of knowledge concerning man and that each interpretation makes toward the goal of a comprehensive statement about aspects of human behavior.

Arkansas is a state rich in historic background because of its important geographical position in terms of the process of westward expansion and because of its rich natural resources. Some work on historic sites in Arkansas has been done in the past, notably National Park Service excavations at the First Fort Smith and at Arkansas Post, and work done by William Westbury of the Arkansas Archeological Survey on the U.S. Fur Factory trading sites at Spadra on the Arkansas River and the Blanton Estate on the Red River. These excavations and interpretations have provided important backgrounds for all future work in this area by giving direct evidence to supplement the documentary accounts of life in the early history of Arkansas. Presently the Arkansas Archeological Survey is embarking on a project of further excavation at Arkansas Post, and I am involved in research concerning a pottery-manufacturing site in Washington County. It is with the progress and potentials of these two investigations that I will deal in this report.

In February of this year it was brought to my attention that the University had a collection of stoneware sherds from the surface of a site at Cane Hill, southwest of Fayetteville. Some of this pottery was marked "J. D. Wilbur, Boonsboro, Ark.", Boonsboro being one of the other names of the once-bustling community of Cane Hill. The name Boonsboro was in use during the period from about 1860-1880; therefore I've assumed that the Wilbur pottery was produced there during this period.

After some inquiry I found that a number of the local citizens knew where the pottery site was and I was led to it by one landowner, Mr. Clay Pyeatte. The kiln itself is still standing and is in a good state of preservation, thanks to the efforts of Mr. Pyeatte and his family. As yet I have done only a surface collection and some preliminary documentary research, but this site is definitely of some importance, and, as such, deserves further attention. The kiln appears to be of a type common in this country in the eighteenth and nineteenth centuries known as a "ground hog" kiln, which derives from an English kiln tradition and takes its name from the use of earth piled on the sides to insulate the kiln and to buttress the arch. The kiln sits at the edge of a gully through which flows a spring-fed stream offering a year-round water supply. On the slope of this gully is the waster dump, or the dump for broken and misfired pieces. The deposit of waster sherds is thick in this area, and it was here that most of the surface collection was picked up. Also in evidence are parts of the foundation of the structure that served as the work area for this small industry.

It is obvious from the surface collection that the Wilbur pottery was producing a wide variety of utilitarian wares ranging from large crocks to flower pots, jugs to milk pans, and drain tiles to butter churns. A solid program of excavation and analysis should also give important insights into the variety of wares and forms produced, the methods of manufacture and firing, and the importance of the potter's role in the frontier community.

The other historic site project in progress in Arkansas is the upcoming excavation of one or more early Federal period structures at Arkansas Post National Memorial. This now dead town on the lower Arkansas River was once an important center for trade and governmental functions. The primary structure with which we hope to deal, Montgomery's Tavern, was built sometime before 1809 and functioned as a trading factory and tavern for some years. In February of 1820 the Territorial Legislature met in the tavern, and it served as a center for social and civic activities. As it is an important structure of the period, the National Park Service is interested in having excavations conducted to locate and identify it, and to provide data that will help to fill out the picture of its functions and importance to the town and the area.

During the last week of March, a group of students and faculty from the University of Arkansas went to Arkansas Post to conduct preliminary excavations to explore the area proposed as the tavern site and the site for this summer's excavations. A series of trenches was laid out and excavated in order to determine what remained of roads, property lines, and structures in this area. Our search for a road that should bound this property on the north was thwarted by the high spring water table, but almost at once we struck the remains of a brick structure in the lot where the tavern is believed to have stood. Here again, the water table prevented complete excavation, but we were able to determine that this was a small brick structure of some sort that collapsed into a subsurface excavation, and was subsequently filled in with domestic trash, including broken ceramics, glass, bones, and iron objects. Further excavation this summer should allow us to identify this structure.

In another trench we found two large postmolds, containing brick rubble and charred wood, that could prove to be part of a fence line at the edge of a lot. Elsewhere, we cut into what appears to be a deposit of domestic trash that may date to the earlier French occupation of this area. Included was a fragment of a marked Dutch clay pipe of a type that was commonly used and traded in the last half of the eighteenth century. Also in this area were fragments of wine bottles, French gunflints, and other domestic refuse.

Though we've only just scratched the surface on both the Wilbur pottery and Montgomery's Tavern, the results are encouraging in both projects, and hopefully these investigations will provide information which will further illuminate Arkansas' historic past and add to the growing body of knowledge concerning human behavior.

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The Demonstration, and A Suggested Immune Role, of Mouse Antibodies Against Salmonella enteritidis Endotoxins

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Mouse immunity or resistance to *Salmonella enteritidis* infection is a complex mosaic of many facets. This report is concerned with that aspect which involves mouse reaction to the endotoxins of the bacteria.

It is a generally held view that protective antibodies against infections by the Gram-negative enteric bacteria, *Salmonella*, are those specific for the Vi, when present, and O (endotoxin) antigens. Antibodies formed against the H (flagellar) antigens are held to be non-protective. Although these views specifically relate to clinical salmonellosis in man, classically typhoid fever, the same is reported for chimpanzees (20) and, by implication, thus would seem to apply to other mammals. Inoculation of mice with *S. enteritidis* was, therefore, expected to result in the development of protective antibodies against the O antigens of the organism (Vi is absent). However, when agglutination tests were conducted with sera from

immunized NAMRU mice, titers were either non-existent or very low (14, 15) compared to titers of 1:320 or more in human typhoid fever. Lockhart and Paulissen (9), therefore, performed agglutination tests under varying conditions to improve the test sensitivity. They found titers up to 1:320 against the H antigens but still only to 1:40 against the O antigens in the mouse antisera. The phenomenon is not peculiar to this strain of mice. Hobson (7) reported agglutinin titers of up to 1:80 in an unidentified strain of mice immunized with *Salmonella typhimurium*. Morello et al (10) were able to detect O agglutinin titers to 1:320 in pooled sera from CD-1 mice hyperimmunized against *S. typhimurium* but, in a group of five individual mice infected with the organism, one had a titer of 1:80 while the rest had 1:40 or less. Hashimoto et al (6) reported that ddN strain mice produced O agglutinin titers of 1:160 one month following immunization with *S. enteritidis*.