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RESEARCH REPORT

TREE-RING DATING OF TWO LOG BUILDINGS IN CENTRAL TEXAS, USA

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ABSTRACT

Tree-ring dating was used to develop construction scenarios for two log structures, the Draper and the Fuller buildings, in the Edwards Plateau region of Texas. The Draper building was constructed in 1902-3, and added onto in 1906. The dating of the Fuller building is less certain, but the structure probably was built in the 1860s or 1870s.

INTRODUCTION

Tree-ring chronologies of post oak (*Quercus stellata*) have been developed for the south-central United States (Stahle et al. 1985) and for the Edwards Plateau region of Texas. Stahle, who dendrochronologically dated historic log buildings in Arkansas, suggested that similar work could be carried out in central Texas using post oak (Stahle 1979). Although the historical and geographical aspects of log buildings in Texas have been extensively researched (Jordan 1978), tree-ring dating has never been attempted. We concentrated our efforts on two log buildings near Fredricksburg, Texas (Figure 1), where Harlan had already developed a living-tree chronology that extended back to the 1700s.

HISTORICAL BACKGROUND

In 1842, The Society for the Protection of German Immigrants in Texas was founded by a group of German noblemen, whose purpose was to direct German immigration to one favorable location and to insure the immigrants' security in their new home overseas (Biesele 1930). Shortly thereafter, Germans immigrated into the Texas Hill Country on the Edwards Plateau, where they maintain their cultural identity to the present. These Germans adopted the Anglo-American tradition of log construction for houses and outbuildings. Though historical records concerning this German settlement in Texas are abundant, tree-ring dating of German log buildings adds resolution to the existing picture of this phase of Texas history and culture.

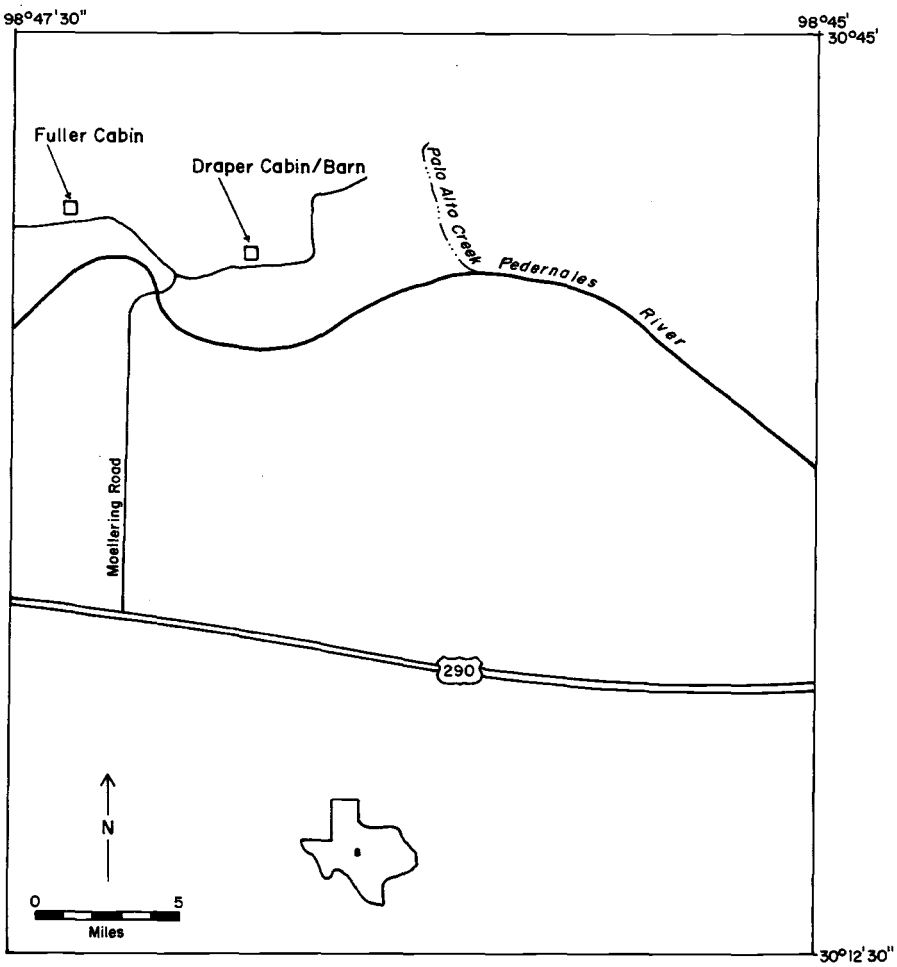

Figure 1. Location of the Draper and Fuller buildings in central Texas.

MATERIALS AND METHODS

Most of the tree-ring specimens are 1/4-inch diameter cores extracted with an electric drill and a Henson boring bit. In the Draper building, we sampled at least one log from each wall and one floor log. We also received permission to take a log section that was being used as chinking. In the Fuller building, we sampled one log from each wall, collected a few of the chinking shims that were lying next to the building, and took a loose roofing shingle. The chinking shims had been split from post oak logs, the roofing shingle from bald cypress (*Taxodium distichum*).

We crossdated the tree-ring specimens using the methods described by Stokes and Smiley (1968). Some of the more difficult samples were dated using synchronous frost injuries as markers. Frost injuries are fairly common in deciduous oaks of the southcentral United States, and are caused by severe freezing temperatures following false-spring conditions (Stahle 1990).

RESULTS

The Draper Building

The land on which the Draper building lies was originally settled by the Oehlers, a German immigrant family. It is presently owned by Mr. John Draper. Next to the log building is a two-story stone house. The Draper building (Figures 2 and 3) is of the double-pen variety with a dog trot between the two pens; the dog trot has a floor of split logs. The building is constructed of simple-hewn post oak logs with V-notched corners. Corrugated metal and milled lumber have been added to the building, obscuring the log structure when seen from a distance.

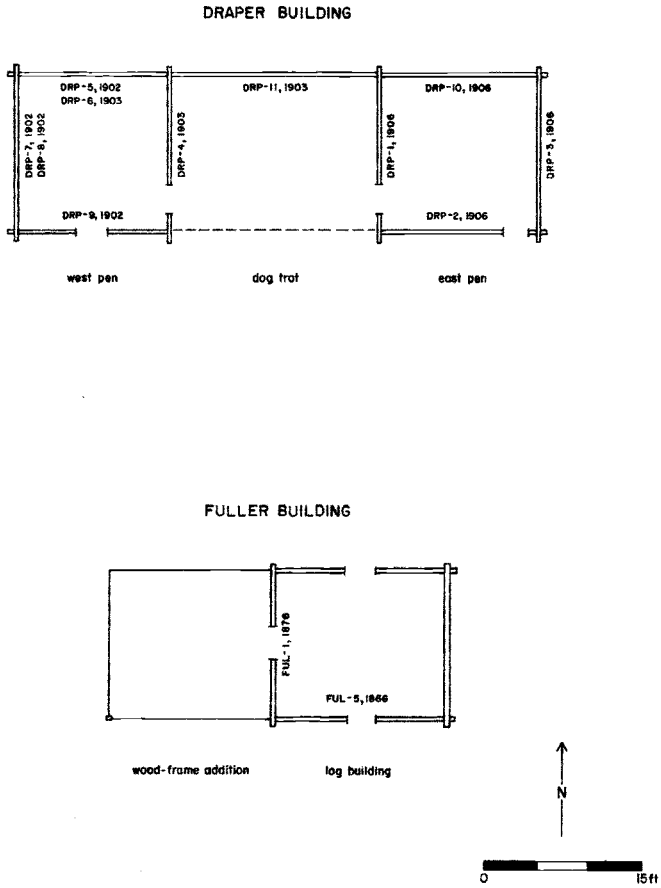

Figure 2. Floor plans of the Draper and Fuller buildings.

Simple-hewn logs are round logs with the bark and branches hewn off. The V-notch method of cornering (Figure 4) was introduced by Germans to Pennsylvania in the 1730s. The Germans who immigrated to the Edwards Plateau in the 1840s, however, came from a part of Germany where stonemasonry was the most common method of construction and thus had to learn from others how to build log structures. They learned the V-notch method from Upper Southerners in the area (Jordan 1978:49-81, 183).

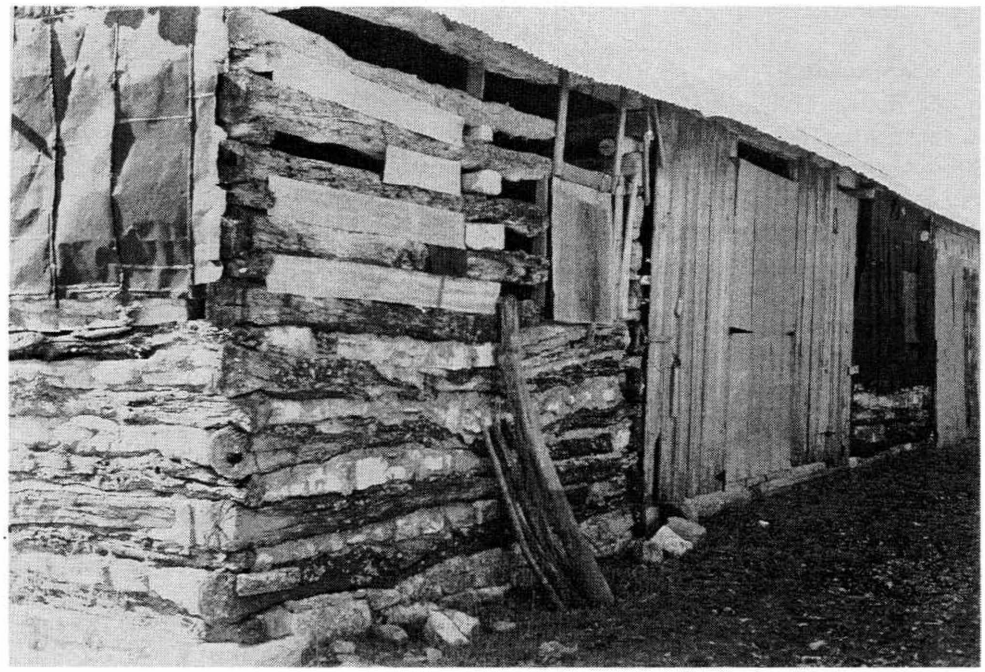

Figure 3. Northeast corner of the Draper building showing the metal sheeting over simple-hewn log walls.

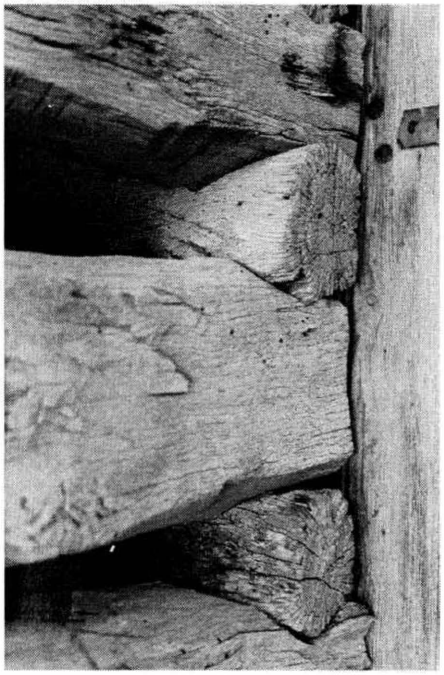

Figure 4. V-notch cornering of wall logs in the Draper building.

From the dating of the specimens (Table 1), we infer that construction of the west pen was completed after the growing season of 1903. Five specimens that have 1902 cutting dates with complete terminal rings were cut after the 1902 growing season but before the 1903 growing season. One of two specimens with 1903 cutting dates has a complete terminal ring, while the other has an incomplete terminal ring. Thus, additional trees were cut during and after the 1903 growing season. Whether construction occurred gradually as the trees were cut or in one event after the cutting was completed is impossible to tell. The structures attached to the Draper building indicate that it had been used most recently as a barn. If the building was originally intended to be a barn, it might have been constructed over several seasons, a barn being less vital than a human shelter.

We infer that the east pen was completed after the growing season of 1906. Four specimens have 1906 cutting dates with complete terminal rings, and one specimen produced a noncutting date of 1905.

The floor log of the dog trot has a cutting date of 1903, associating it with the west pen. The dog trot could have been a porch attached to the west pen; when the east pen was added, the porch could have become a dog trot. However, since we sampled only one floor log, we cannot be certain about the construction scenario for the dog trot.

Table 1. Outside dates of tree-ring samples from the Draper building. Log # indicates the position of the log in the wall: Log #1 is next to the foundation, Log #2 on top of Log #1, and so forth.

Structure/ Sample No.	Provenience		Outside Ring Date[1]	Terminal Ring
West Pen:				
DRP-6	North Wall	Log #1	1903L	incomplete
DRP-5	North Wall	Log #2	1902L	complete
DRP-4	East Wall	Log #1	1903L	complete
DRP-9	South Wall	Log #1	1902L	complete
DRP-7	West Wall	Log #2	1902L	complete
DRP-8	West Wall	Log #3	1902L	complete
DRP-13	West Wall	Chinking Log	1902L	complete
Dog Trot:				
DRP-11	Floor Log		1903v	complete
East Pen:				
DRP-10	North Wall	Log #3	1906L	complete
DRP-12	North Wall	Log #10	1905vv	indeterminate
DRP-3	East Wall	Log #3	1906L	complete
DRP-2	South Wall	Log #2	1906L	complete
DRP-1	West Wall	Log #2	1906L	complete

[1]Symbols used with dates:

L The characteristic surface beneath the bark is present. A cutting date.

v A subjective judgement that, although there is no direct evidence of the true outside on the specimen, the date is a cutting date.

vv There is no way of estimating how far the last ring is from the true outside. A noncutting date.

The Fuller Building

The land on which the Fuller building is situated was originally settled by the Goehmanns, a German immigrant family. It is presently owned by the Fuller family of Fredricksburg. The building (Figure 2) is of the single-pen variety and has one-and-a-half floors, the half floor being an attic space just below the pitched roof. The building is constructed from rough-hewn post oak logs, indicating somewhat more workmanship than simple hewing. Rough-hewn logs are cut flat on both sides (Jordan 1978). Like the Draper building, the Fuller building has V-notched corners. From the dating of the specimens (Table 2), we are unable to propose any definite construction scenario. We have only two cutting dates, 1866 and 1876, and no clustering of dates to aid in determining construction patterns. Mr. Fuller informed us that the Goehmanns settled in the area in 1863, a date that does not seriously conflict with either of the cutting dates. The only determination we can make for certain is that some kind of building activity — either construction or repair — took place in or after 1866.

Table 2. Outside dates for tree-ring samples from the Fuller building. Log # indicates the position of the log in the wall as in Table 1.

Sample No.	Provenience		Outside Ring Date[1]	Terminal Ring
FUL-2	North Wall	Log #8	1863vv	indeterminate
FUL-4	East Wall	Log #6	no date	indeterminate
FUL-3	South Wall	Log #3	1875vv	indeterminate
FUL-5	South Wall	Log #6	1866L	complete
FUL-1	West Wall	Log #3	1876B	complete
FUL-6	Chinking Shim		1863vv	indeterminate
FUL-7	Chinking Shim		1865vv	indeterminate
FUL-8	Chinking Shim		1855vv	indeterminate
FUL-9	Roof Shingle (bald cypress)		no date	indeterminate

[1]Symbols used with dates:

B Bark present. A cutting date.

L The characteristic surface beneath the bark is present. A cutting date.

vv There is no way of estimating how far the last ring is from the true outside. A noncutting date.

CONCLUSIONS

This project was constrained by time and funding. Ideally, we would like to have sampled every log in each building. Finding date clusters is more likely with larger numbers of samples. Augmenting the tree-ring dating with historical documents would have been helpful as well. However, we have shown that tree-ring dating of log cabins in central Texas is feasible, a necessary first step towards further study in a region historically rich and full of dendrochronological potential.

ACKNOWLEDGMENTS

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