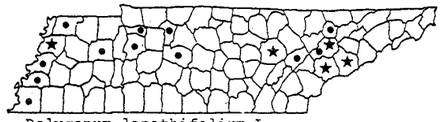
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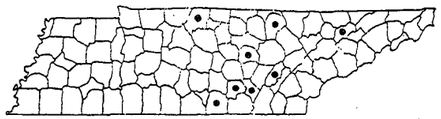
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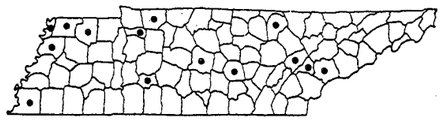
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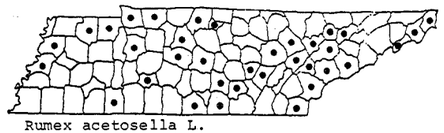
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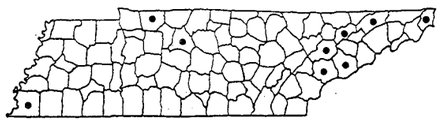
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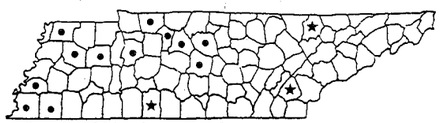
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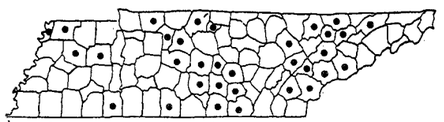
★ Rumex conglomeratus Murray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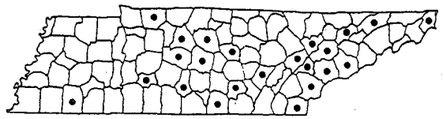
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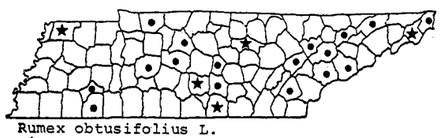
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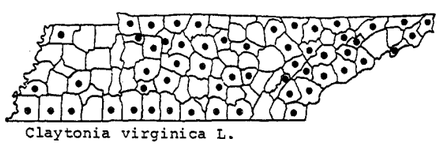
★ Rumex patientia L.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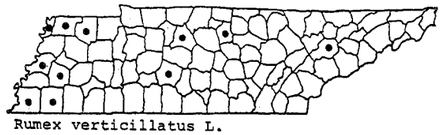
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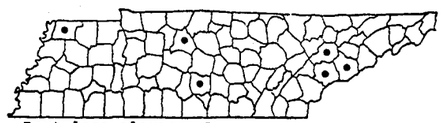
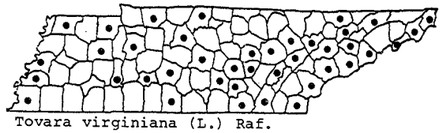

Portulaca oleracea L.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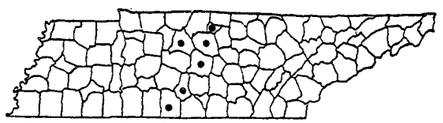
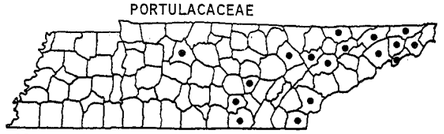
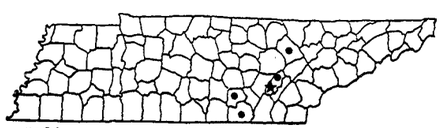

Talinum calcaricum Ware

PORTULACACEAE


Claytonia caroliniana Michx.


Talinum mengesii W. Wolf
★ Talinum teretifolium Pursh

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SUBSURFACE LOWER PENNSYLVANIAN LITHOSTRATIGRAPHY ON THE SOUTHI CUMBERLAND PLATEAU SEQUATCHIE COUNTY, TENNESSEE

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ABSTRACT

Coreholes and air rotary boreholes tested the Pennsylvanian Gizzard and Crab Orchard Mountains Groups for coal seam distribution on the Southern Cumberland Plateau in northeastern Sequatchie County, Tennessee.

INTRODUCTION

Recent drilling by the Lucky Cumberland Mining Company on the Smartt Mountain and Savage Point quadrangles in Sequatchie County, Tennessee (Fig. 1), has brought to light the subsurface distribution of Lower Pennsylvanian lithostratigraphic units. The purpose of this paper is to develop a stratigraphic framework for these Pennsylvanian rocks.

STRATIGRAPHY

C. W. Wilson and others (1956) presented the following stratigraphic subdivision of Pennsylvanian rocks in southern Tennessee:

Crab Orchard Mountains Group	Rockcastle Conglomerate
	Vandever Upper Shale
	Vandever Needleseye Sandstone
	Vandever Lower Shale
	Newton Sandstone
	Whitwell Shale
Gizzard Group	Sewanee Conglomerate
	Signal Point Shale
	Warren Point Sandstone
	Raccoon Mountain Formation

DISCUSSION

Whiteoak Swamps Area, Smartt Mountain Quadrangle—Three coreholes were drilled in this area to search out mineable coal seams (Fig. 2). Figure 3 indicates the subsurface distribution of Lower Pennsylvanian rocks. Note that no coal was discovered in the lower part of the Whitwell Shale in holes 2 and 3.

Hole 2 contains several feet of shale with thin sandstone layers. This shale has been considered as the Signal Point Shale. It is not present in holes 1 and 3 and therefore it is not possible to distinguish the Sewanee Conglomerate and Warren Point Sandstone.

The Raccoon Mountain formation is present in all three coreholes and is composed of lensing shale, siltstone, sandstone and coal units. The lateral coal thickness range is so large (2-53 inches) here that these coals cannot be considered as mineable seams under existing conditions.

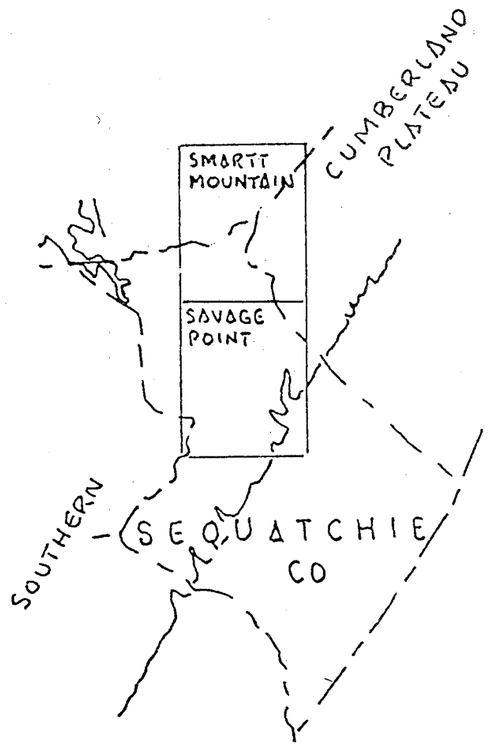

FIG. 1. *Location of Smartt Mountain and Savage Point Quadrangles in Sequatchie County on the Southern Cumberland Plateau, Tennessee.*

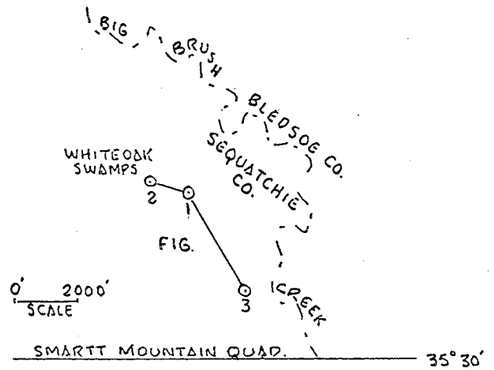

FIG. 2. *Location of coreholes near Whiteoak Swamps on Smartt Mountain Quadrangle, Sequatchie Co., Tennessee.*

All three coreholes bottomed in the Mississippian Pennington Formation which is marked by limestone or red or green shale or siltstone.

Kelly Creek Area, Savage Point Quadrangle—A number of air rotary boreholes were drilled in the Kelley Creek area (Fig. 4) to test the Whitwell Shale for the Sewanee and Richland coal seams.

Figure 5 indicates that the Sewanee seam ranges in thickness from 6 inches (holes 22, 23) to 36 inches in holes 14 and 24. No coal was found in holes 17 and 18.

The Richland seam was encountered in three holes—

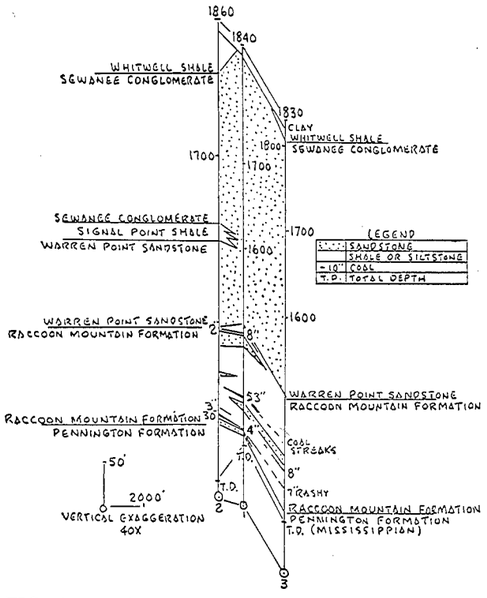

FIG. 3. *Panel diagram showing lower Pennsylvanian stratigraphic framework near Whiteoak Swamps, Smartt Mountain Quadrangle, Sequatchie County, Tennessee.*

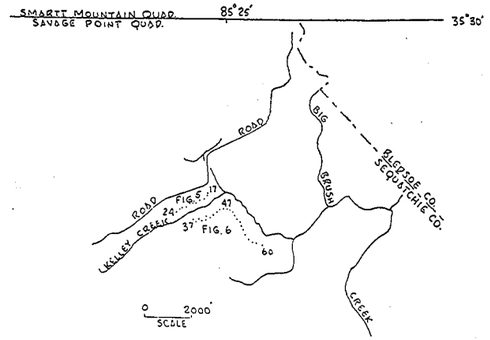

FIG. 4. *Location of boreholes (Figs. 5, 6) near Kelley Creek, Savage Point Quadrangle, Sequatchie Co., Tennessee.*

18 inches in hole 19, 60 inches in hole 21 and 36 inches in hole 23. One of the idiosyncrasies of drillers is that once they locate a coal seam they are loath to drill deeper to locate possible additional seams. Therefore, there may, or may not, be Richland coal in the remaining holes because, if unsupervised, the driller refused to drill deep enough to locate the Richland seam.

Figure 6 indicates that the Sewanee seam ranges in thickness from no coal in hole 55 to 36 inches in holes 46, 52, 54 and 57. The Richland ranges in thickness from no coal in holes 37, 39, 40, 41, 42 and 59 to 36 inches in holes 55 and 56. Note that both the Sewanee and Richland seams appear to be rising in elevation to the southeast (toward hole 60).

In summary, in the Kelley Creek area, both the Sewanee and Richland coal seams show a marked lateral variation in thickness, and on this basis are a good strip mining prospect. However, Figure 5 indicates that the elevation of both seams are just below Kelley Creek drainage and therefore strip mining would materially affect Kelley Creek drainage. Undoubtedly strip mining here would encounter environmental problems. Also, mine drainage would be a serious problem if underground mining were attempted.

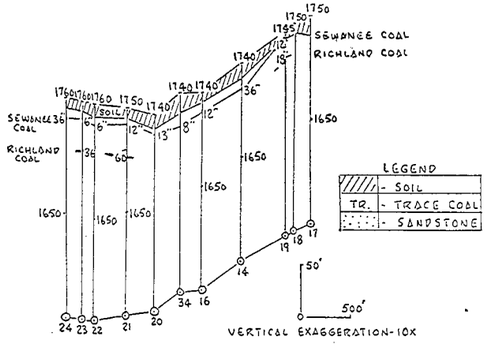

FIG. 5. *Panel diagram based on air rotary borehole data showing the lensing nature of the Sewanee and Richland coal in the Whitwell shale near Kelley Creek, Savage Point Quadrangle, Tennessee.*

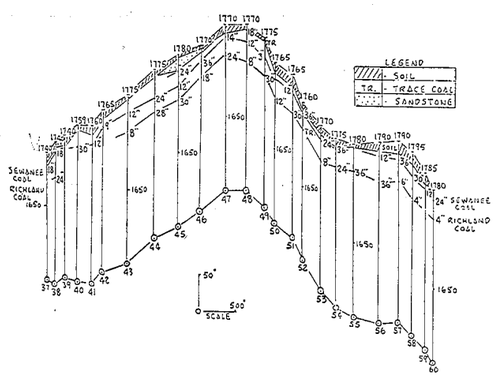

FIG. 6. *Panel diagram based on air rotary borehole data showing the lensing nature of the Sewanee and Richland coal in the Whitwell shale near Kelley Creek, Savage Point Quadrangle, Tennessee.*

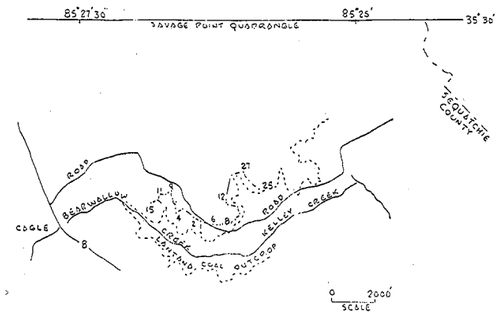

FIG. 7. *Location of boreholes (Fig.) near Bearwallow Creek, Savage Point Quadrangle, Sequatchie Co., Tennessee.*

Bearwallow Creek Area, Savage Point Quadrangle—Over 20 air rotary boreholes were drilled in the Bearwallow Creek area (Fig. 7) to test the Vandever Lower Shale for the Lantana coal seam. Holes 1-15 (western portion of diagram, Fig. 8) bottomed in the upper part of the Newton Sandstone. Lantana coal thicknesses range from no coal in holes 5, 6, 10, 13, 14, 11 and 26 to 42 inches in hole 1.

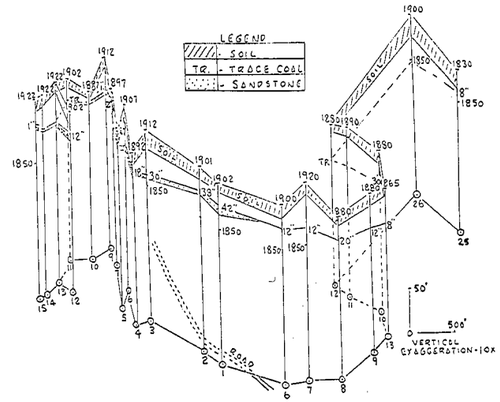

FIG. 8. *Panel diagram based on air rotary borehole data showing the lensing nature of the Lantana coal in the lower Vandever shale near Bearwallow Creek, Savage Point Quadrangle, Tennessee.*

SUMMARY

Coreholes and air rotary boreholes tested portions of the Pennsylvanian Raccoon Mountain Formation, Whitwell Shale and Vandever Lower Shale for coal seam thickness variation. In so doing, part of the subsurface distribution of the lithostratigraphic units in the Gizzard Group and Crab Orchard Mounains Group was determined. This information should be of use to those individuals involved in mapping this area.

LITERATURE CITED

Wilson, C. W., Jr., Jewell, J. W. and Luther, E. T., (1956), Pennsylvanian Geology of the Cumberland Plateau: Tennessee Division of Geology Folio, 21 p.

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A LABORATORY STUDY OF SUBSTRATE AND TEMPERATURE PREFERENCES OF THREE SPECIES OF FRESHWATER PLANARIANS (TURBELLARIA: TRICLADIDA)

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Middle Tennessee State University
Murfreesboro, Tennessee 37132

ABSTRACT

Responses of three species of freshwater, epigean planarians to substrate and a temperature gradient were determined in the laboratory and compared to field observations. One hundred specimens of each species were presented five types of substrate on nine different occasions, and another 100 specimens of each species were arranged in a temperature gradient of 3.5 to 38.5°C on twelve different occasions. *Dugesia dorotocephala*

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