# ABBOTT FORMATION (PENNSYLVANIAN) IN SOUTHERN ILLINOIS

GEORGE A. DESBOROUGH
*Southern Illinois University, Carbondale*

The Abbott Formation (Kosanke, *et al.*, 1960), formerly the lower Tradewater Group, of Jackson County in extreme southwestern Illinois is considered to comprise those lower Pennsylvanian sediments which are stratigraphically above the Caseyville Formation and below the Murphysboro Coal (Fig. 2). The interval of strata occupying the position of the Abbott Formation in southwestern Illinois has not been discussed previously because of correlation problems between the Jackson and Williamson County areas (Fig. 2). The author presents a hypothesis which may account for the differences in thickness and the problems in correlation between these two areas.

In the Jackson County area thin coal and limestone lenses are present in the Abbott Formation, but their limited lateral persistence has not aided correlation within the area or with outlying areas.

The base of the Abbott Formation is at the top of the Pounds Sandstone (Kosanke, *et al.*, 1960). The Pounds Sandstone is a thick, massive sandstone which contains quartz pebbles and is resistant to weathering. The Abbott strata locally rest on the Pounds Sandstone unconformably. The basal Abbott unit recognized in the Jackson County area is the Boskydell sandstone (Desborough, 1959). It is a ferruginous sandstone whose conglomeratic components are mainly shale, quartz and chert pebbles. Poorly preserved marine fossils are present in the sandstone. The Boskydell sandstone is locally calcareous, micaceous, and may contain impure limestone lenses. The occurrence of marine fossils and its ferruginous character serve to distinguish the Boskydell from the Pounds Sandstone.

It appears that the Boskydell sandstone represents the interval of strata defined as the Abbott Formation in central Jackson County (Fig. 2). If this is the case, the Abbott is quite thin in the Jackson County area in comparison with adjacent areas to the east. In central Jackson County the Abbott strata have a maximum thickness of about 135 feet and a minimum of about 100 feet.

Cady (1952) suggested that the Murphysboro Coal of Jackson County may correlate with the New Burnside Coal in the area east of Jackson County. Kosanke, *et al.*, (1960) are in general agreement on this point. In the area just east of Jackson County, that is Williamson County, Potter and Glass (1958) reported an average thickness of about 500 feet of Abbott (lower Tradewater) strata below the New Burnside Coal (Fig. 2). If the correlation of these two coals is approximately correct, the area east of the Duquoin monocline began its first significant subsidence during Abbott sedimentation. This is apparent if the Abbott section east of the Duquoin monocline is compared with that west of it (Fig. 2).

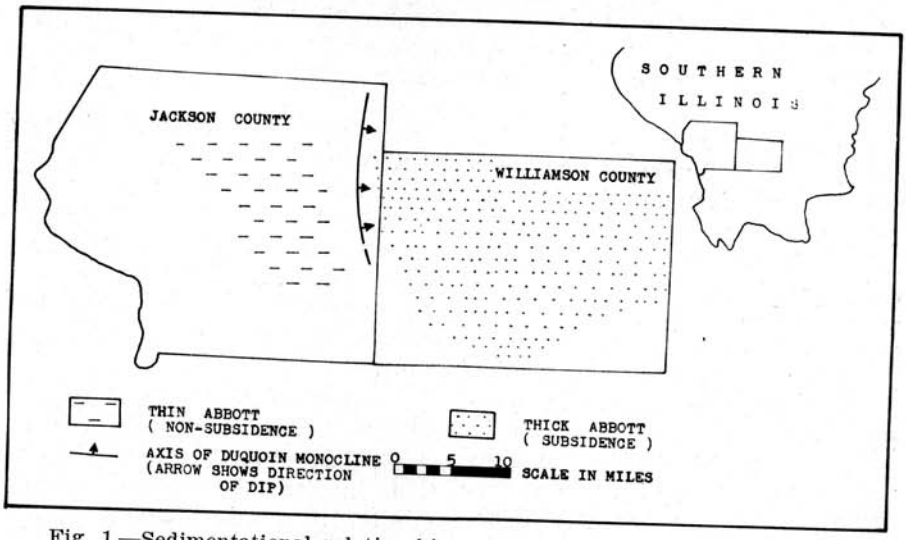


Fig. 1.—Sedimentational relationships of the Abbott Formation on each side of the Duquoin monocline.

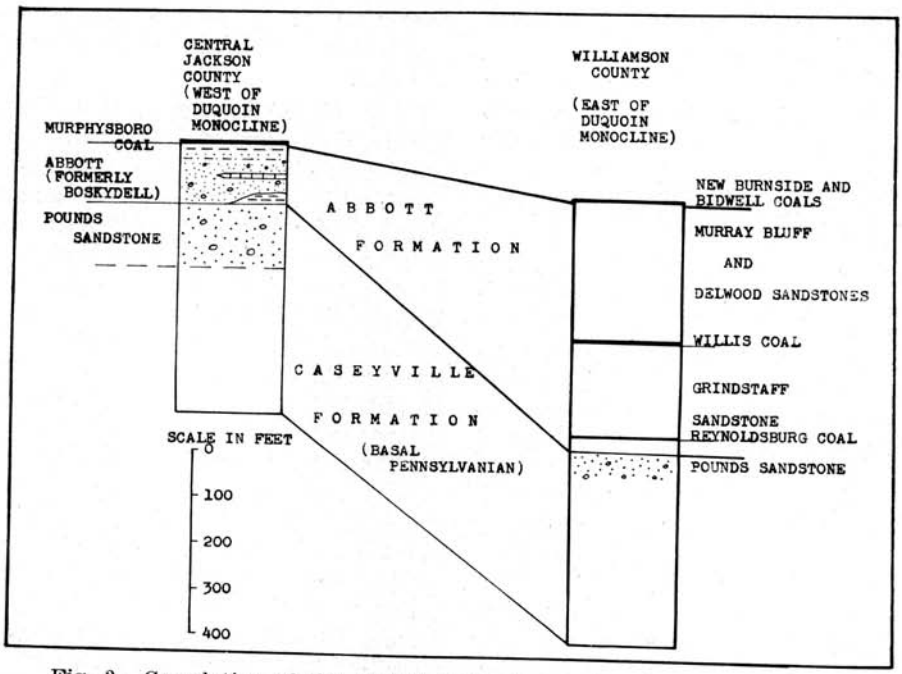


Fig. 2.—Correlation of the Abbott Formation east and west of the Duquoin monocline in southwestern Illinois.

The average thickness of the Abbott Formation east of the Duquoin monocline locally exceeds the thickness to the west by about 400 feet. The difference in thickness is believed to be primarily responsible for the difficulty in the correlation of the units within the Abbott Formation on either side of the Duquoin monocline.

If the Murphysboro Coal correlates approximately with the Bidwell or New Burnside Coal (Kosanke, *et al.*, 1960), the Boskydell sandstone of Jackson County correlates with part of (or parts of) the basal Abbott Formation (Grindstaff Sandstone) recognized in the area east of the Duquoin monocline.

Since there is no significant difference in the thickness of strata older than Abbott on either side of the Duquoin monocline in central Jackson and Williamson Counties, it appears that in this area, the monocline developed initially during Abbott sedimentation (Fig. 1). In other words, during early Abbott sedimentation in these counties, the area east subsided more rapidly than the area west of the Duquoin monocline.

In the Williamson County area quartz pebbles are quite rare above the Pounds Sandstone (Potter and Glass, 1958). In contrast, numerous large quartz pebbles are locally abundant in the Abbott Formation (Boskydell sandstone) of Jackson County (Desborough, 1959). In general, the source of quartz pebbles was almost depleted by the end of Caseyville sedimentation (Potter and Glass, 1958) and their paucity in the Abbott Formation in southeastern Illinois attests to this. Probably the best explanation of the local abundance of quartz pebbles in the Jackson County area is that most of these pebbles were locally derived from erosion of the underlying conglomeratic Caseyville strata.

## Conclusions

1.) The Duquoin monocline probably began its initial significant development in extreme southwestern Illinois during Abbott sedimentation.

2.) The Boskydell sandstone in the Jackson County area largely represents that stratigraphic interval defined as the Abbott Formation; however, the Boskydell sandstone is probably equivalent in age to beds in the lower part of the Abbott Formation in southeastern Illinois.

## Acknowledgment

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