STUDY OF THE INTERVAL BETWEEN COAL NO. 6 AND THE SHOAL CREEK LIMESTONE *

BY

M. W. FULLER

Illinois State Geological Survey, Urbana, Illinois

Stratigraphic studies of Pennsylvanian cyclothems in Illinois have shown that thicknesses of the individual cythothems vary considerably in different parts of the basin. This variation has resulted from two factors, (1) proximity to source area of sediments, and (2) differential warping during Pennsylvanian time, generally along preëxisting axes.

In general, cyclothems increase in thickness toward the southeast. This is particularly true of the sandstone and sandy shale members. Coals increase in number because of the wedging in of many new cyclothems toward the source area. Underclays and marine beds, however, generally increase in thickness toward the north and west.

In studying the general thickening of Pennsylvanian sediments to the southeast, two persistent, easily recognizable beds, coal No. 6 and the Shoal Creek limestone, were chosen and the interval between them was determined at as many points as possible. From these data an isopachous contour map was prepared. This shows a decrease in interval over known anticlinal structures and an increase in interval over known synclinal structures.

This interval has a minimum thickness of 83 feet in northwest Macoupin County on the flank of a nose of the old Ozark dome which during Pennsylvanian time was much more stable than the progressively subsiding basin. Here six cycles are represented between coal No. 6 and the Shoal Creek limestone. Several lack their sandstone, coal, and shale members. The interval is greatest in east central White County in the deepest part of the basin where 708 feet of strata are present between the datum planes and about 14 cyclothems are represented.

The most important structure in Illinois that affected Pennsylvanian sedimentation was the DuQuoin anticline. This structure was initiated at the close of Mississippian time and differential warping continued throughout the Pennsylvanian period. The interval between coal No. 6 and the Shoal Creek limestone increases markedly east of the anticline as the result of the wedging in of many new cyclothems and the thickening of clastic members of the persistent ones. The effect of the LaSalle anticline on Pennsylvanian sedimentation is less well known but was probably similar, as several sandstones wedge out on the flanks of the structure, making traps for oil and gas.

In northeast Madison County and adjacent parts of Montgomery and Bond counties there is a decrease in interval which marks the crests of the New Douglass dome and Panama anticline. In the southwest part of Marion County and adjacent parts of Clinton and Washington counties there is a decrease in interval which seems to be closely related to the structures from which oil and gas are obtained.

Because this isopachous map shows a decreased interval over known anticlinal areas, it is possible that this method of mapping will reveal previously unknown structures which might yield oil or gas.

* Published with the permission of the Chief, Illinois State Geological Survey.