

THE SUBSURFACE STRATIGRAPHY OF THE DEVONIAN IN WESTERN ILLINOIS

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In the study of sample well cuttings and their residues from solution in acid, the Devonian strata in Adams, Hancock and McDonough counties is found to have the same divisions as in the Davenport and Rock Island regions. The Wapsipinicon limestone is at the base and the Cedar Valley above.

The Wapsipinicon is further sub-divided in the region studied into the Otis at the base—a very fine grained somewhat sandy, fossiliferous, slightly dolomitic limestone; the Independence shale above—a weak, plastic, massive, calcareous shale; and the Davenport at the top and occupying the greater part of the Wapsipinicon formation—a clean, hard, lithographic limestone which is slightly sandy near the top.

In the Cedar Valley limestone five distinct horizons were recognized: (1) a basal, fossiliferous, slightly dolomitic limestone, very sandy at the bottom and slightly cherty throughout. The lower sandy zone grades to a true sandstone with fine to medium rounded grains which is the Hoing sand; (2) A very cherty, fossiliferous, slightly dolomitic limestone differing from the basal horizon in containing only a trace of sand. Since this is recognizable only near Warsaw and in the northern part of Adams County, it may be of only local occurrence; (3) An argillaceous, dolomitic limestone containing dark gray, calcareous fossils such as Tentaculites, ostracods, and brachiopod fragments. This horizon is a typical development of the Cedar Valley as described from the Rock Island region; (4) A very cherty, slightly dolomitic, fossiliferous limestone containing some sand; (5) A somewhat

variable limestone which is sandy at the base and grades upward to a slightly cherty, lithographic limestone near the top.

In most of Adams and Hancock counties the complete Devonian succession is found but over the Colmar-Plymouth dome in southwestern McDonough County only the basal Cedar Valley is present, the Wapsipinicon having been eroded away before Cedar Valley time. Southwestward from the Colmar-Plymouth dome the Devonian thins rapidly to and disappears entirely in a small area in the southeast corner of Hancock County. It reappears to the west and in the north-central part of Adams County the maximum thickness of 170 feet for the area studied is reached. Northwestward in Iowa a single set of cuttings from the Mt. Pleasant well shows a thickness of 247 feet and southwestward another set in Shelby County, Missouri, shows 182 feet. The increase of the Devonian thickness is mostly in the Cedar Valley for the Wapsipinicon is generally constant in thickness.

The Hoing sandstone at or in the base of the Cedar Valley limestone is similar in character to the Devonian Beauvais sandstone of southeastern Missouri. There it lies directly below the St. Laurent limestone which is correlated by Branson¹ with the Callaway in northeastern Missouri and the Cedar Valley of Iowa. It therefore appears that the Hoing sand is the northern extension of the Beauvais sandstone.

The Devonian system lies unconformably on the eroded edges of older strata. At the Colmar-Plymouth dome it is underlain by the basal Maquoketa shale. Westward it rests on the Kimmswick, except for a few remnants of the Maquoketa, and the two sets of cuttings from northeastern Missouri and southeastern Iowa indicate that the same is true west of the Mississippi River. In the Rock Island region² outcrop studies indicate a slight erosional unconformity between the Wapsipinicon and the Cedar Valley. This is emphasized on the Colmar-Plymouth dome. Sample well cuttings in certain places show a dark brown to brownish gray, finely laminated shale at this horizon. The Cedar Valley is overlain unconformably by the Sweetland Creek shale which everywhere contains a thin basal pyritic sandstone composed of reworked Devonian sand grains.

¹ Branson, E. B., *Devonian of Missouri*, Missouri Bureau of Geology and Mines, Volume XVII, 2nd Series, 1923, page 2.

² Ekblaw, G. E., unpublished report, Illinois State Geological Survey, 1930.