

REGIONAL FACTORS THAT CONTROL OIL
AND GAS ACCUMULATIONHashim F. Al-Khersan
University of Texas, M. A. Thesis, January 1966

A B S T R A C T

A comparison of three diverse producing provinces indicates that oil and gas which gained access to the reservoir rocks migrated as far as the continuity of the permeable reservoir permitted, until they accumulated finally at stratigraphic or structural barriers impassable to further movement.

Oil fields in Upper Cretaceous formations of southwestern Arkansas produce from sands, which have an identifiable distribution with relation to the position of contemporary shorelines. Regional lateral gradation from sandstone to shale defines one limit of potentially productive territory. The up-dip regional boundary of production occurs where a major fault system cuts across the area of good sand development and supplied traps which halted further migration. Origin of the oil was in shale, which is interbedded with the sandstone.

The great Lima, Ohio-Indiana, oil and gas field is at the up-dip edge of an extensive porous dolomite facies of the Trenton (Middle Ordovician) limestone, where the regional reservoir terminates on the limbs of the broad Cincinnati arch. Probably the oil and gas were indigenous to the Trenton; during development of the major structural feature and its associated minor flexures they migrated from a wide area to accumulate locally.

Most of the oil and gas in the Ellenburger Limestone (Early Ordovician) of west Texas and New Mexico occur in a widespread porous zone which resulted from subaerial leaching during a brief time, before the Ellenburger was covered by the impermeable Joins Limestone of the Ordovician Simpson Group. The porous upper part of the Ellenburger produces little oil where a much longer time elapsed before it was covered. The hydrocarbons were indigenous to the Ellenburger and were retained in it within the district where it was soon covered. A late Mississippian-Early Pennsylvanian orogeny formed numerous anticlines in which the oil and gas of the regional reservoir accumulated locally.