

WYOMING GEOLOGICAL ASSOCIATION-
UNIVERSITY OF WYOMING GEOLOGY DEPARTMENT
Annual Joint Meeting May 3, 1985
Hilton Inn, Casper

Abstracts of Papers

ANGEVINE, CHARLIE L., and TURCOTTE, D.L.

Oil Generation in Overthrust Belts

The burial of immature sediments beneath a thrust sheet may result in sufficient heating to generate hydrocarbons.

We present a model for the thermally activated generation of oil from kerogen and the subsequent destruction of the oil through cracking. Using this oil generation model in conjunction with a model applicable to the thermal evolution of overthrust belts, we have studied the evolution of oil in sediments beneath a thrust sheet composed of sedimentary rocks. Oil generation may begin soon after emplacement of the thrust sheet. Beneath thick thrust sheets (>8 km), all oil in the sedimentary section may be destroyed less than 5 m.y. after thrusting.

We apply our results to the timing of oil generation in the sedimentary section beneath the Absaroka thrust plate in the Fossil syncline of western Wyoming. Our calculations indicate that the Paleozoic and a part of the Mesozoic section were thermally mature prior to emplacement of the Absaroka plate. The remaining part of Mesozoic sediments matured only after thrusting. Our results are in agreement with Warner's (1980) observations that oil being produced from reservoirs in the Absaroka plate was generated in the underthrust Mesozoic section.