

Williston Basin and Paris Basin, Same Hydrodynamics, Same Potential for Unconventional Resources?

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In the early eighties, a surge in the number of discoveries of conventional oil in the Rhaetian sandstones of the Paris Basin can be linked to John Brewster's Williston Basin analogy. The hydrodynamics were seemingly the same and a "per descendum" migration process was invoked in both cases. The hydrocarbon migrates downward because of the sealing capacity of the shales; it then migrates laterally in the underlying strata where local traps and sizeable fields have been found.

The similarity between both basins could possibly be extended to unconventional oil deposits. The Bakken Formation is a hot play for horizontal wells targeting a relatively tight sandstone (and carbonate) unit sandwiched between two shales. Those two individual shales are typical of a major transgression overloading a platform that responds by isostatic rebound. They are laterally equivalent to the Exshaw and Besa River shale in Alberta where the same dual episode of transgression is recognized. The organic rich shales are the source rock and the seal for the Bakken play.

In the Paris Basin, the Toarcian shales are the main source rock and are similar in many respects to the Bakken shales. The "schistes Carton" crop out near Besancon in Eastern France and have been recognized as a major oil deposit in the early seventies after major disasters related to construction works (including motorways and buildings). The rock behaved as a sandstone under pressure but as a slate when the overburden was removed. The civil engineering nightmares, leading to the understanding of the Schistes carton, will be described to illustrate the nature of this unconventional play.

The central part of the Paris Basin is now the focus of renewed exploration as industry is starting to understand the similarity with the Bakken Play. Numerous wells targeting the Rhaetian sandstones have provided extensive coverage over the Liassic interval where the prospective "Banc de Roc" limestone is sandwiched between the Lower Domerian shales and the Toarcian Shales of the Schistes Carton.

Analogy with other transgressive shales and source rocks in intracratonic basins will be made.