Sedimentology and Fossil Biota of a Pennsylvanian "Waterhole" Deposit in a Dryland Alluvial Plain Setting, Joggins, Nova Scotia[1]

M. C. Rygel[2], H. J. Falcon-Lang[3], J. H. Calder and M. R. Gibling[2]

Arguably the world's finest Pennsylvanian exposure, the cliffs of Joggins, Nova Scotia are most famous for their fossil lycopod forests preserved within gray-colored, peat-forming wetland deposits. Although less well-known, thick red bed intervals deposited in dryland alluvial plains also form an integral component of the classic Joggins section. The sedimentology and fossil biota of one dryland alluvial plain unit is described, providing important insight into the paleoecology of poorly-understood Pennsylvanian drylands.

The study interval, informally termed the "Hebert beds", comprises five sandy channel-bodies exposed in both the cliff face and the wave-cut platform. Based on their low width to thickness ratios (W T<8) and lack of lateral migration features, the three oldest channel-bodies (3.4-5.7 m thick) are interpreted as fixed-channel deposits. In contrast, the two youngest channel-bodies (1.8-3.5 m thick) have higher W:T ratios (probably ;21), abundant lateral accretion surfaces, and are interpreted as meandering channel-bodies. These five channel-bodies formed under different, but genetically related flow conditions and are interpreted as the deposits a progressively abandoned, anastomosed fluvial system.

Floral remains within the channel fills are dominated by cordaite gymnosperms (*Cordaites* leaves, *Artisia*-type pith casts, and charcoalified pycnoxylic wood). *Calamites* fragments, decorticated lepidodendrid trunks (*Sigillaria*?), and calcareous rhizoconcretions are also locally present. Invertebrate remains comprise shells of the land snail *Dendropupa* and the large freshwater clam *Archanodon westoni*. Vertebrate remains are represented by the pelvic girdle of a large tetrapod and the jaws of a microsaur. This unusual association of fossils within channel-bodies is interpreted as a "waterhole" deposit which provided an important source of water for a variety of organisms during the tropical dry season.

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[2]Department of Earth Sciences, Dalhousie University, Halifax, NS, Canada B3H 4J1; mike_rygel@hotmail.com
[3]Department of Earth Sciences, University of Bristol, Bristol, United Kingdom BS8 1RJ