QUATERNARY RECORD IN THE QUEBEC APPALACHIANS LACKS OLDER GLACIAL EVENTS RECORDED IN QUATERNARY STRATIGRAPHY OF THE MIDWEST

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Detailed stratigraphic studies were carried out on dozens of natural and manmade exposures of glacial and related sediments and on samples from 48 deep boreholes through drift to bedrock in the Chaudiere River Basin south of Quebec City. Detailed geochemistry and mineralogy, coupled with palynology and other biological data from well-preserved Sangamon-age fluvial sediments indicate that the deposits of three major glacial events, one pre-Sangamon and two post-Sangamon, lie directly on regolith of undoubted preglacial age.

Quantitative evidence that constrains interpretation of these sedimentary units includes: 1) complete kaolinite conversion of the preglacial regolith; 2) few species of heavy minerals in the preglacial regolith compared to the wide variety of heavies in the Canadian Shield-derived suites in overlying glacial deposits; 3) very low concentrations of nickel and other simatic metals in the regolith compared to those in sediments produced by glaciers that eroded outcrops of regionally extensive ophiolitic lithologies.

The lack of evidence for glacial events older than the Illinoian in Quebec seems to indicate that the effects of cold climate episodes have shifted resultant glacial intensity from the central part of the continent, where abundant evidence of pre-Illinoian episode glaciations exist, to the eastern part, where the later, Wisconsinan glacial phases appear to have marked the most intense glaciation. The causes of this apparent west to east shift in intensity of glaciation over the past million years must be understood if global climatic models are to be successful in predicting our climatic future.