

GSA 2014



19-22 October | Vancouver, BC, Canada

[Start](#) | [View Uploaded Presentations](#) | [Author Index](#) | [Meeting Information](#)

2014 GSA Annual Meeting in Vancouver, British Columbia (19–22 October 2014)

Paper No. 87-8

Presentation Time: 10:20 AM

THE PLIOCENE MISSISSIPPI RIVER

[VAN ARSDALE, Roy B.](#), Earth Sciences, University of Memphis, 1 Johnson Hall, Memphis, TN 38152, BALCO, Greg, Berkeley Geochronology Center, 2455 Ridge Road, Berkeley, CA 94709, BIERMAN, Paul, Department of Geology, University of Vermont, Delehanty Hall, 180 Colchester Ave, Burlington, VT 05405, ROOD, Dylan H., AMS Laboratory, Scottish Universities Environmental Research Centre (SUERC), East Kilbride, G75 0QF, United Kingdom, ROVEY, Charles, Geography, Geology, and Planning Department, Missouri State University, 901 S. National Ave, Springfield, MO 65897, COX, Randel T., Earth Sciences, University of Memphis, 109 Johnson Hall, Memphis, TN 38152, LUMSDEN, David N., Earth Sciences, The University of Memphis, 3600 Walker Ave, Memphis, TN 38152 and PARKS, Alan, Exploration and Planning, Memphis Stone and Gravel, 1111 Wilson Street, Memphis, 38101, rvanrsdl@memphis.edu

High level ancestral Mississippi River (Arc River) terrace gravels have been mapped from northern Illinois south to Louisiana with previous investigators assigning stratigraphic age estimates ranging from Miocene to Pleistocene. From north to south this gravel is locally named the Grover, Mounds (originally Lafayette), Upland Complex (name used herein), pre-loess sand and gravel, and Citronelle. Upland Complex exists on the highest pre-loess divides along the Mississippi River and at some locations is up to 30 m thick. The Upland Complex is interpreted to be the residual basal sand and chert gravel facies of an estimated 100 m thick Arc River floodplain that was 200 km wide near Memphis, Tennessee. Very large paleo-meanders of the Arc River in northwest Mississippi reveal a discharge of 6 to 8 times that of the modern Mississippi River. The Arc River had its head waters in southern Canada and its drainage basin was twice as large as the modern Mississippi River. Upland Complex gravel does not contain crystalline rocks thus southern Canada must have been covered with lower Paleozoic sedimentary rocks when being drained by Arc River.

We extracted quartz for ^{26}Al - ^{10}Be burial dating from two samples collected 2 m above the base of a 12-m-thick unit of massive Upland Complex gravel exposed in a quarry 10 km north of Memphis. Given the assumptions that the samples were derived from steady erosion of the upstream watershed and experienced a single period of burial at their present location, apparent burial ages are 3.1 ± 0.5 Ma and 3.35 ± 0.3 Ma. (note that if these assumptions fail, these would represent maximum limiting rather than exact ages). These data are consistent with the hypothesis that the Upland Complex gravels record the late Pliocene configuration of the Mississippi River prior to the onset of continental glaciation.

Session No. 87

[Fluvial Geomorphology](#)

Monday, 20 October 2014: 8:00 AM-12:00 PM

208/209 (Vancouver Convention Centre-West)

Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.228

© Copyright 2014 The Geological Society of America (GSA), all rights reserved. Permission is hereby granted to the author(s) of this abstract to reproduce and distribute it freely, for noncommercial purposes. Permission is hereby granted to any individual scientist to download a single copy of this electronic file and reproduce up to 20 paper copies for noncommercial purposes advancing science and education, including classroom use, providing all reproductions include the complete content shown here, including the author information. All other forms of reproduction and/or transmittal are prohibited without written permission from GSA Copyright Permissions.

Back to: [Fluvial Geomorphology](#)[<< Previous Abstract](#) | [Next Abstract >>](#)
