

SEDIMENTOLOGICAL RECORD OF CARBONIFEROUS MOUNTAIN GLACIATION IN AN EXHUMED PALEOVALLEY, EASTERN PAGANZO BASIN, LA RIOJA PROVINCE, ARGENTINA

RABASSA, Jorge ¹, SOCHA, B.J. ², CARIGNANO, Claudio ³ and MICKELSON, D.M. ²

¹Laboratorio de Geología del Cuaternario, CADIC, C.C. 92, 9410 Ushuaia, Tierra del Fuego, Argentina.

²Department of Geology & Geophysics, University of Wisconsin, 1215 West Dayton Street, Madison, Wisconsin, USA, 53706; ³Instituto de Ambientes de Montaña y Regiones Aridas, Universidad Nacional de Chilecito, La Rioja, Argentina,

Glaciers covered much of Gondwana during the Carboniferous and Permian, and although glacial and deglacial sediments are well preserved in some areas of the depositional basins formed along the active western margin of the supercontinent, the geographic extent and characteristics of the glaciations that occurred are not well resolved. Late Paleozoic strata found as far west as the western side of the Paganzo basin in northwestern Argentina are characterized as the products of mid Carboniferous mountain or valley glaciers (Lopez-Gamundi, 1987; Limarino & Gutierrez, 1990). However, evidence of glacial advance and retreat is also present in a paleovalley on the eastern side of the Paganzo basin, indicating more widespread Carboniferous mountain glaciation than previously considered.

The paleovalley, cut into basement rock and infilled with a thick sequence of sediment, has since been exhumed by erosion, exposing a detailed depositional record of changing environmental conditions. Geomorphic attributes, including a striking U-shaped valley, indicate a glacial origin of the paleovalley. The thick sedimentary sequence includes several facies of proglacial fluvial and lacustrine origin. Previously the deposits were interpreted as entirely glacial lacustrine with episodes of delta and alluvial fan construction (Andreis *et al.*, 1986; Sterren & Martinez, 1996). Ice-rafted dropstones, and sediment gravity flow deposits indicate near ice deposition, however direct evidence of warm-based valley glaciation is preserved at the base of a diamictite unit interpreted to be subglacial tillite. The bouldery diamictite is composed largely of locally derived granitic basement rock. We attribute features observed in the diamictite to high rates of deposition, and the susceptibility of preweathered, granitic basement rock to glacial erosion. Corestones, weathered from the basement rock during Devonian or other pre-Carboniferous period of intense weathering, constitute the large clasts (up to 3 meters in diameter) in the diamictite. We also suggest a transitional (fjord) environment may have existed along the eastern edge of the Paganzo basin as a marine influence is indicated by studies of microfossils by Gutierrez & Limarino (2001) and clay mineral assemblages by Net *et al.* (2002).