Paleoproterozoic terranes in southern South America: accretion to Amazonia, involvement in Rodinia formation and further W. Gondwana accretion.

C. Casquet[1], C. W. Rapela[2], R. J. Pankhurst[3], E., Baldo[4], C. Galindo[1], J. Saavedra[5]

[1] *Universidad Complutense, Madrid, 28035, Spain*
[2] *CONICET-UNLP, La Plata, 1900, Argentina*
[3] *BGS, Nottingham, NG12 5GG, United Kingdom*
[4] *CICTERRA-UNC, Córdoba, 5016, Argentina*
[5] *CSIC, Salamanca, 37071, Spain*
casquet@geo.ucm.es

Evidence for reworked Paleoproterozoic basement in southern South America is found in the Arequipa block (Peru), the Rio Apa massif (southern Brazil and Paraguay) and in the Maz suspect terrane in the Western Sierras Pampeanas (Argentina), among other minor outcrops. The combined Paleo-proterozoic pattern is one of orogeny between ca. 1.7 and 2.1 Ga (Statherian to Rhyacian), involving: a) early magmatism (ca. 1.9 – 2.1 Ga) presumably emplaced through partly Archean continental crust, b) sedimentation of thick siliciclastic deposits, c) UHT metamorphism at ca. 1.87 Ga (Arequipa), and d) late felsic magmatism at 1.70 – 1.79 Ga (Loewy et al., 2004; Cordani et al., 2008; Casquet et al., 2009 *submitted*). Reconstruction of the Paleoproterozic paleogeography is hindered by the dispersal of the outcrops. On the basis of similar Nd model ages and U-Pb SHRIMP zircon ages we hypothesize that these terranes were part of a single continental mass that accreted to Amazonia during the collisional San Ignacio orogeny (eastern Bolivia) between 1.34 and 1.32 Ga (Boger et al., 2005), or even earlier. The large resulting landmass - the South America Megacraton (SAM) - was further involved in the Grenvillian orogeny as a result of collision with Laurentia during the amalgamation of Rodinia.

Evidence for a complex Grenvillian accretionary and collisional history between 1.27 and 1.03 Ga has been recognized in the Western Sierras Pampeanas (Rapela et al. 2009, *submitted*). It consists of andino-type arc magmatism in a Paleoproterozoic basement, arc–continent collisions and related high-T and intermediate-P metamorphism, development of an arc/back-arc oceanic complex, subduction-related arc magmatism including late TTG suites, and AMCG complexes. We infer that the Western Sierras Pampeanas Grenvillian terranes are relics of an active margin developed along the western boundary (present coordinates) of the SAM during protracted collision with Laurentia. The 1.2 -1.1 Ga Sunsás orogeny of eastern Bolivia and southern Brazil largely resulted from complex intracontinental strike-slip reactivation distributed across the former suture zone between Amazonia and the southern Paleoproterozoic continental landmass. High-T low-P regional metamorphism in Arequipa between 1.04 and 0.85 Ga and ca.0.85 A-type granitoids of the Maz terrane probably resulted from protracted extension following the main Grenvillian contractional phases.

Laurentia drifted away from the SAM in late Neoproterozoic to early Cambrian times (550–540 Ma) after protracted rifting, leading to opening of the Iapetus Ocean and formation of the proto-Andean continental margin. This process was coeval with oblique closure of the hypothetic Clymene Ocean on the eastern of the SAM. Closure of the latter ocean resulted in oblique collision of the SAM with other cratonic landmasses such as the Kalahari and Rio de la Plata cratons (Rapela et al., 2007), producing the Pampean – Paraguay – Araguaia orogenic belts along its eastern margin and the final amalgamation of Western Gondwana.

Rapela, C.W., Pankhurst, R.J., Casquet, C., Fanning, C.M. Baldo, E., Gonzalez Casado, J.M., Galindo, C. & Dahlquist, J., 2007, Earth-Science Reviews, 83, 49-82.
Rapela, C.W., Pankhurst, R.J., Casquet, C., Baldo, E., Galindo, C., Fanning, C.M. & Dahlquist, J., 2009, Journal South American Earth Sciences, *submitted.*
Casquet, C., Fanning, C.M., Galindo, C., Pankhurst, R.J., Rapela, C.W. & Torres, P., 2009, Journal South American Earth Sciences, *submitted.*
Boger, S.D., Raetz, M., Giles, D., Etchart, E. & Fanning, C.M., 2005, Precambrian Research, 139, 121-146.
Loewy, S.L., Connelly, J.N., & Dalziel, I.W.D., 2004, Geological Society of America Bull., 116, 171-187.
Cordani, U.G., Tassinari, C.C.G., Teixeira, W. & Coutinho, J.M.V., 2008, VI SSSAGI, Bariloche, Argentina, proceedings.