IGCP 493: THE RISE AND FALL OF THE VENDIAN BIOTA (EDIACARAN) 2009 COUNTRY REPORTS

Gilberto and Guillermo Acenolaza (Argentina)

Aceñolaza, F.G. & Toselli, A. 2009. The Pampean Orogen: Ediacaran-Lower Cambrian evolutionary history of Central and Northwest region of Argentina.In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a focus onsouthwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp. 239-254.

Aceñolaza, G.F., Germs, G.J.B. & Aceñolaza, F.G., 2009. Trace fossils and the Agronomic Revolution at the Neoproterozoic-Cambrian transition in Southwest Gondwana. In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change andEvolution: a focus on southwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp. 339-347.

Aceñolaza, F.G. & Aceñolaza, G.F., 2008. El Ediacarano-Cámbrico temprano de la provincia de Jujuy: Caracteres peleontológicos, paleoecológicos y paleogeográficos. Relatorio 17 Congreso Geológico Argentino. 29-36. Jujuy.

Field work: We have been working with Robert and Karin Frei (Univ. Copenhagen) sampling the Ediacaran-Early Cambrian Puncoviscana Formation for Cr isotope analysis and the stratigraphycal interpretation of the whole sequence. With Alejandro Toselli we are working on the conglomerates included in the unit, searching for the interpretation of such a rare sedimentary facies.

Paulo Boggiani (Brasil)

Alvarenga, CJS , Boggini, P. C. , Babinski, M. , Dardenned, M. A., Figueiredo, M. , Santos, R. V. & Dantas, E. L. 2009. The Amazonian Paleocontinent. In: Claudio Gaucher, Alcides N. Sial, Galen P. Halverson & Hartwing E. Frimmel. (Org.). Neoproterozoic-Cambrian Tectonics, Global Change and Evolution - A Focus on Southwestern Gondwana. Develpments in Precambrian Geology, 16, Elsevier.

L. Boutois and M. Mangano (Canada)

Buatois, L.A., Mángano, M.G., Brussa, E., Benedetto, J.L. & Pompei, J. 2009. The changing face of the deep: Colonization of the Early Ordovician deep-sea floor, Puna, northwest Argentina. Palaeogeography Palaeoclimatology Palaeoecology 280: 291-299.

Although it is focused on an Ordovician ichnofauna, it contains a discussion of the early colonization of the deep sea, including the Ediacaran-Cambrian transition.

Claudio Gaucher (Uruguay)

The following chapters published recently in the book series "Developments in Precambrian Geology" relevant to IGCP 493:

Gaucher, C., Germs, G.J.B. (2009) Skeletonised Metazoans and Protists. Neoproterozoic-Cambrian biota.

In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a focus on southwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp 327-338.

Gaucher, C.; Poiré, D.G. (2009) Biostratigraphy. Neoproterozoic-Cambrian evolution of the Río de la Plata Palaeocontinent. In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a focus on southwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp. 103-114.

Gaucher, C., Sprechmann, P. (2009) Neoproterozoic acritarch evolution. Neoproterozoic-Cambrian biota. In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a focus on southwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp. 319-326.

Germs, G.J.B., Miller, R.McG., Frimmel, H.E., Gaucher, C. (2009) Syn- to late- orogenic sedimentary basins of southwestern Africa. Neoproterozoic to Early Palaeozoic evolution of southwestern Africa. In: Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (Eds): Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a focus on southwestern Gondwana. Developments in Precambrian Geology, 16, Elsevier, pp. 183-203.

David Evans (USA)

Evans, D.A.D., in press. The palaeomagnetically viable, long-lived and all-inclusive Rodinia supercontinent reconstruction. In: Murphy, J.B., Keppie, J.D., and Hynes, A., eds., Ancient Orogens and Modern Analogues. Geological Society of London Special Publication 327: 371-405.

Denyszyn, S.W., Halls, H.C., Davis, D.W. & Evans, D.A.D., 2009. Paleomagnetism and U-Pb geochronology of Franklin dykes in High Arctic Canada and Greenland: A revised age and paleomagnetic pole constraining block rotations in the Nares Strait region. Canadian Journal of Earth Sciences, v.46: 689-705.

Li, Z.X., Bogdanova, S.V., Collins, A.S., Davidson, A., De Waele, B., Ernst, R.E., Evans, D.A.D., Fitzsimons, I.C.W., Fuck, R.A., Gladkochub, D.P., Jacobs, J., Karlstrom, K.E., Lu, S., Natapov, L.M., Pease, V., Pisarevsky, S.A., Thrane, K., and Vernikovsky, V., 2009. How not to build a supercontinent: A reply to J.D.A. Piper. Precambrian Research, v.174: 208-214.

Kendall, B., Creaser, R.A., Calver, C.R., Raub, T.D. & Evans, D.A.D., 2009. Correlation of Sturtian diamictite successions in southern Australia and northwestern Tasmania by Re-Os black shale geochronology and the ambiguity of "Sturtian"-type diamictite - cap carbonate pairs as chronostratigraphic marker horizons. Precambrian Research, v.172: 301-310.

Hartwig Frimmel (Germany)

Frimmel, H.E., 2009, Configuraton of Pan-African orogenic belts in southwestern Africa. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 145-151.

Frimmel, H.E., Miller, R.McG., 2009, Continental Rifting. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in

Precambrian Geology, Elsevier, Amsterdam, v. 16: 153-159.

Frimmel, H.E., Miller, R.McG., 2009, Mineral deposits. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 227-229.

Gaucher, C., Frimmel, H.E., Germs, G.J.B., 2009, Tectonic events and palaeogeographic evolution of Southwestern Gondwana in the Neoproterozoic and Cambrian. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 295-318.

Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E., 2009, The Neoproterozoic and Cambrian: A time of upheavals, extremes, and innovations. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 3-11.

Germs, G.J.B., Miller, R.McG., Frimmel, H.E., Gaucher, C., 2009, Syn- to late orogenic sedimentary basins of southwestern Africa. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 183-203.

Miller, R.McG., Frimmel, H.E., 2009, Syn- to post-orogenic magmatism. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa:In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v.16: 219-226.

Miller, R.McG., Frimmel, H.E., Halverson, G.P., 2009, Passive continental margin evolution. Neoproterozoic to Early Palaeozoic evolution of southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 161-181.

Miller, R.McG., Frimmel, H.E., Will, T.M., 2009, Geodynamic synthesis of the Damara Orogen sensu lato. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 231-235.

Kaufman, A.J., Sial, A.N., Frimmel, H.E., Misi, A., 2009, Neoproterozoic to Cambrian palaeoclimatic events in southwesternGondwana. In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 369-388.

Will, T.M., Miller, R.McG., Frimmel, H.E., 2009, Orogenic tectono-thermal evolution. Neoproterozoic to Early Palaeozoic evolution of Southwestern Africa: In Gaucher, C., Sial, A.N., Halverson, G.P., Frimmel, H.E. (eds.), Neoproterozoic-Cambrian Tectonics, Global Change and Evolution: a Focus on Southwestern Gondwana, Developments in Precambrian Geology, Elsevier, Amsterdam, v. 16: 205-218.

Other publications pertaining to the topic of IGCP493 are:

Frimmel, H.E., 2009, Trace element distribution in Neoproterozoic carbonates as palaeoenvironmental indicator, Chemical Geology 258: 338-353.

Jiang, S.-Y., Pi, D.-H., Heubeck, C., Frimmel, H.E., Liu, Y.-P., Deng, H.-L., Ling, H.-F., Yang, J.-H., Zhu, M., 2009, Early Cambrian ocean anoxia in South China, Nature, 459,: E5-E6.

Dimitri Grazhdankin (Russia)

Maslov AV, Grazhdankin DV, Podkovyrov VN, Isherskaya MV, Krupenin MT, Petrov GA, Ronkin YuL, Gareev EZ, Lepikhina OP 2009 [Provenance composition and features of geological evolution of the Late Vendian foreland basin of the Timan Orogen] Geokhimiya, 12: 1294–1318 [in Russian; English translation published by Pleiades Publishing in Geochemistry International, 47(12): 1212–1233].

Grazhdankin DV, Maslov AV, Krupenin MT 2009 [Structure and depositional history of the Vendian Sylvitsa Group in the Western Flank of the Central Urals] Stratigraphiia. Geologicheskaia korreliatsiia, 17(5): 20–40 [in Russian; English translation published by Pleiades Publishing in Stratigraphy and Geological Correlation, 17(5): 475–492].

Grazhdankin DV, Maslov AV 2009 [Sequence stratigraphy of the Upper Vendian of the East European Craton] Doklady Akademii nauk, 426(1): 66–70 [in Russian; English translation published by Pleiades Publishing in Doklady Earth Sciences, 426(4): 517–521].

Kontorovich AE, Sokolov BS, Kontorovich VA, Varlamov AI, Grazhdankin DV, Efimov AS, Klets AG, Saraev SV, Terleev AA, Belyaev SYu, Varaksina IV, Karlova GA, Kochnev BB, Nagovitsin KE, Postnikov AA, Filippov YuF 2009 [The first section of Vendian deposits in the basement complex of the West Siberian Petroleum Megabasin (resulting from the drilling of the Vostok-3 parametric borehole in the Eastern Tomsk Region)] Doklady Akademii nauk, 424(6): 788–791 [in Russian; English translation published by Pleiades Publishing in Doklady Earth Sciences, 425(2): 219–222].

Kath Grey (Australia)

Grey, K and Willman, S, 2009, Taphonomy of Ediacaran acritarchs from Australia: significance for taxonomy and biostratigraphy. PALAIOS, v. 24: 239-256.

Grey, K, and Sugitani, K, 2009, Palynology of Archean microfossils (>3.0 Ga) from the Mount Grant area, Pilbara Craton, Western Australia: further evidence of biogenicity, Special issue on World Summit on Ancient Microscopic Fossils, University of California, Los Angeles edited by JW Schopf, MR Walter, D Bottjer, Precambrian Research, v. 173: 60-69.

Sugitani, K, Grey, K, Nagaoka, T. Mimura, K, Walter, MR, 2009, Putative Archaean microfossils (>3.0 Ga) from the Mount Goldsworthy and Mount Grant area in the Pilbara Craton, Western Australia: Taxonomic reinterpretation and implications of ancient biotic diversity and evolution: Special issue on World Summit on Ancient Microscopic Fossils, University of California, Los Angeles edited by JW Schopf, MR Walter, D Bottjer, Precambrian Research, v. 173: 50-59.

Sugitani, K, Grey, K, Nagaoka, T and Mimura, K, 2009, Three-dimensional morphological and textural complexity of Archean putative microfossils from the northeastern Pilbara Craton: Indications of biogenicity of large (>15µm) spheroidal and spindle-like structures: Astrobiology, v. 9: 603-615.

Soren Jensen (Spain)

Cohen, P.A., Bradley, A., Knoll, A.H., Grotzinger, J.P., Jensen, S., Abelson, J., Hand, K., Love, G., Metz, J., McLoughlin, N., Meister, P., Shepard, R., Tice, M. & Wilson, J.P. 2009. Tubular compression fossils from the Ediacaran Nama Group, Namibia. Journal of Paleontology 83, 110-122. DOI: 10.1666/09-040R.1

Cortijo, I. Marti Mus, M. Jensen, S. & Palacios, T. 2009. A new species of *Cloudina* from the terminal Ediacaran of Spain. Precambrian Research. DOI:10.1016/j.precamres.2009.10.010

Mark Laflamme and Guy Narbonne (Canada)

Bamforth, E.L. & Narbonne, G.M. 2009. New Ediacaran rangeomorphs from Mistaken Point, Newfoundland, Canada, Journal of Paleontology 83: 897-913.

Laflamme, M., Xiao, S. & Kowalewski, M. 2009. Osmotrophy in Modular Ediacara Organisms. Proceedings of the National Academy of Sciences USA. v. 106 (34): 14438–14443. *cover article.

Narbonne, G. M. & Laflamme, M., Greentree, C. & Trusler, P., 2009. Reconstructing a lost world: Ediacaran Rangeomorphs from Spaniard's Bay, Newfoundland. Journal of Paleontology, 83 (4): 503-523.*cover article.

Xiao, S. & Laflamme, M. 2009. On the Eve of Animal Radiation: Phylogeny, Ecology, and Evolution of the Ediacara Biota. Trends in Ecology and Evolution, 24 (1): 31-40. *cover article.

Various abstracts:
Laflamme, M., Schiffbauer, J.D., Narbonne, G.M., and Briggs, D.E.G. 2009. Ediacaran soft-bodied preservation by microbe-particle interactions. GSA annual meeting, Portland, OR.

Laflamme, M., Xiao, S., and Kowalewski, M. 2009. Modular construction in the growth and feeding of the Ediacara biota. North American Paleontology Convention, Cincinnati, OH. USA.

Laflamme, M. 2009. Classifying early life: the ecology of Ediacaran fronds. A World in Transition III: Neoproterozoic Earth History.Princeton University.

We also had a field trip in September to Mistaken Point as part of the "Evolution of Complex Life" working group in affiliation with the NASA Astrobiology Institute (NAI) at the Massachusetts Institute of Technology (MIT).

M. Moczydlowska (Sweden)

Moczydlowska, M. & Willman, S., 2009. Ultrastructure of cell walls in ancient microfossils as a proxy to their biological affinities. Precambrian Research 173, 27-38.\DOI:10.1016/j.precamres.2009.02.006.

Moczydlowska, M., Schopf, J. W. & Willman, 2009. Micro- and nano-scale ultrastructure of cell walls in Cryogenian microfossils: revealing their biological affinity. Lethaia, DOI 10.1111/j.1502-3931.2009.00175.

Moczydlowska, M., 2009. Ultrastructure of organic cell walls in Proterozoic microalgae. Geophysical Research Abstracts, Vol. 11, EGU2009-0. 2009, EGU General Assembly 2009.

Sue Turner (Australia)

Blieck A, Turner S, Burrow C J, Schultze H-P, Reif W-E†, Rexroad C B, Nowlan G S 2009. Organismal biology, phylogeny and strategy of publication: why conodonts are not vertebrates? 3rd Int. Conf. GeologicaBelgica, Ghent, 14-15 Sept, Challenges for the Planet: Earth Sciences' Perspective, Programme and abstracts, Ghent University, 19-20.

Blieck A, Turner S, Burrow C J, Schultze H-P, Rexroad C B, 2009. Organismal biology, phylogeny and strategy of publication: why conodonts are not vertebrates? In: 69th SVP/ 57th SVPCA, Univ. Bristol, September 23-26, J. Vert Paleo. 29, Supplement to No. 3, Abstracts of papers, 65A.
Cooper, BC, Oldroyd, D., Turner S. & Vickers-Rich, P. 2009. Reg Sprigg and the Ediacara fauna: an extraordinary discovery. tag no. 153, Dec, p. 18.

Schultze, H.-P.[1], Turner, S.[2,3,5], Blieck, A.[4], Burrow, C. J.[3], Reif, W.-E.[5†], Rexroad, C. B.[6], Nowlan, G.S.[7] 2009. Phylogenetische und systematische Stellung der Conodonten [Phylogenetic and systematic position of the conodonts]. Palaeontolisches Gesellschaft, Bonn, Oct 4., Abstracts, 1p.

Schultze, H.-P., Turner, S. & Grigelis, A. 2009. Great Northern Researchers: Discoverers of the earliest Palaeozoic vertebrates. In, Forty Years of Early Vertebrates: papers from the 11th International Symposium on Early and Lower Vertebrates. Acta Zoologica, 90 (Suppl. 1): 3–21 (May 2009) doi: 10.1111/j.1463-6395.2008.00387.x

Turner, S. 2009. Not so quiet persuasion: the canon of women in the geological sciences. Review of Cynthia V. Burek, & Barbara Higgs, eds, The Role of Women in the History of Geology. London: The Geological Society, Special Publication 281, 2007. Pp. viii + 342. £85 HB. Metascience, 18.3, 405-4, online November 2009

Turner, S. & Oldroyd, D. 2009. Reg Sprigg and the Discovery of the Ediacara Fauna in South Australia: Its Approach to the High Table. 254-278. In Seposki, D. & Ruse, M. eds The Paleobiological Revolution. Essays on the Growth of Modern Paleontology. University of Chicago Press, Chicago & London. April

Turner, S. 2009. Saving Planet Earth: What we can learn from Geoparks. In: Lin, Jiun-Chuan ed. 2009. East Asiaian Geoparks - Vision, Problems and Prospects. Taiwan East Asia International Geopark Conference April 27 - May 5 2009, Abstracts volume. The Geographical Society of China in Taipei, Taipei, Taiwan, 119-121.

V. C. Tewari (India)

Tewari , V.C. , 2009. Proterozoic unicellular and multicellular fossils from India and their implications, In: Seckback , J. (ed. From fossils to Astrobiology , Springer Verlag , The Netherlands , 119-139.

Tewari, V.C. and Chela Flores, J. 2009 , Possible role of Sulfur on the Early Diversification of life on Earth : Astrobiological implications. In : Srivastava K L. (Ed.) Economic Mineralization. Scientific Publishers , India , Jodhpur, 53- 56.In Press / under Review: Tewari , V.C and Sial, A.N.

Tewari, V. C.Ediacaran Chemostratigraphy of the Lesser Himalaya , India, Precambrian Research (under review). This paper was presented in the 33 rd I.G.C., OSLO in the SYMPOSIUM ON MPC-03, PRECAMBRAIN IISOTOPE CHEMOSTRATIGRAPHY

Tewari, V.C., 2009. Neoproterozoic – Early Cambrian sedimentary basins of the Lesser Himalaya , India with special reference to the glacial diamictite – Ediacaran carbonate sedimentation. (Geological Society of London , Special Publication , under review).

Activities: Delivered a KEY Note address in the Second International Conference on Precambrian Continental Growth and Tectonism held at Department of Geology , Bundelkhand Univesity, Jhansi, 24-28 February, 2009. The title of the talk was: Neoproterozoic Snowball Earth and the sedimentological evolution of the Lesser Himalaya , India. The summary is given below.

James Valentine (USA)

Valentine, J. W., 2009. The infusion of biology into paleontological research.. In Sepkoski, D., and Ruse, M. (eds.) The Paleontological Revolution. Univ. Chicago Press, Chicago. Valentine, J. W. Overview of marine biodiversity. Pp. 3-28 in Witman, J. D, and Roy, K. (eds.) Marine Macroecology. Univ. Chicago Press, Chicago: 385-397.

Xiao, Shuhai (USA)

Dong, L., S. Xiao, B. Shen, C. Zhou, G. Li, and J. Yao, Basal Cambrian microfossils from the Yangtze Gorges area (South China) and the Aksu area (Tarim Block, northwestern China). Journal of Paleontology, 83: 30-44.

Liu, P., S. Xiao, C. Yin, F. Tang, and L. Gao, Silicified tubular microfossils from the upper Doushantuo Formation (Ediacaran) in the Yangtze Gorges area, South China. Journal of Paleontology, 83 630-633.

Laflamme, M., S. Xiao, and M. Kowalewski, Osmotrophy in modular Ediacara organisms. Proceedings of the National Academy of Sciences, USA. 106: 14438-14443.

McFadden, K.A., S. Xiao, C. Zhou, and M. Kowalewski, Quantitative evaluation of the biostratigraphic distribution of acanthomorphic acritarchs in the Ediacaran Doushantuo Formation in the Yangtze Gorges area, South China. Precambrian Research, 173: 170-190.

Shen, B., S. Xiao, C. Zhou, and X. Yuan, Yangtziramulus zhangi new genus and species, a carbonate-hosted macrofossil from the Ediacaran Dengying Formation in the Yangtze Gorges area, South China. Journal of Paleontology, 83: 575-587.

Xu, B., S. Xiao, H. Zou, Y. Chen, Z.-X. Li, B. Song, D. Liu, C. Zhou, and X. Yuan, SHRIMP zircon U-Pb age constraints on Neoproterozoic Quruqtagh diamictites in NW China. Precambrian Research, 168: 247-258.

Xiao, S. and M. Laflamme, On the eve of animal radiation: Phylogeny, ecology and evolution of the Ediacara biota. Trends in Ecology & Evolution, 24: 31-40.