IGCP 493 THE RISE AND FALL OF THE VENDIAN BIOTA

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As so eloquently pointed out in the introduction to IGCP Project 478 (led by Dr Claudio Gauchier from Uruguay) the Proterozoic and early Phanerozoic, especially "the Neoproterozoic-Early Palaeozoic saw the occurrence of some of the most significant events in Earth history" which included a glaciation on a global scale, dramatic changes in the composition of oceans and atmosphere, marked changes in continental configuration and, from the point of view of this IGCP proposal (IGCP493) the appearance and great increase in biodiversity of metazoans culminating in the first occurrence of a variety of hard tissue skeletons that marks the end of the Proterozoic and beginning of the Phanerozoic.

This project is intimately linked with IGCP 478, and which can take advantage of a number of field conferences and symposia (the first held in South Africa and Namibia in October 2003) already in train under the umbrella of IGCP 478. Both are particularly interested in investigating the precise timing of Proterozoic events, the effects that these changing environments, climates, global chemistry and palaeogeogrphy had on the development and diversification of animals which culminated in the spectacular Vendian faunas, best represented along the Winter Coast of the White Sea in Russia, the Flinders Range of South Australia and Namibia.

This project sets out to locate additional material from areas with a sparse Vendian biotic record (South America in particular), but with marked palaeobiogeographic interest, to closely compare their settings (sedimentology, carbon and oxygen isotope signatures, palaeogeographic positions) with those of the best known Vendian biotas. This project aims to allow the proposers to gain further experience with those biodiverse Vendian assemblages in Namibia, Russia, the Ukraine, Newfoundland and the Flinders Range of South Australia and with other older assemblages such as those in the Bangamall Basin of Western Australia and the Western United States, where some of the oldest probable records of multicellular organisms have been reported. In doing so, the proposers will bring researchers from other areas to examine and gain experience with two highly biodiverse assemblages in Australia and Russia, to involve students in this interaction, in the hope of markedly increasing the amount of material from some of the lesser known locales and refining the dating of all of these locales.

Parellel to our investigations concerning the megascopic multicellular biota, the work of several associates of this proposal (Beresford, Bierlein, Cartwrignt, Schaefer, Wilde, Cas) are investigating the geochemistry of the sediments for clues to changing climate and ocean chemistry and the involvement of microfauna in the deposition of major ore bodies of mid to late Proterozoic age.

Year 1. (2003) Australia, Russia and Southern Africa

- Field workshop on White Sea, Winter Coast and Souzma, Summer Coast, Russia Field guide prepared.
- Fieldtrip to significant Australian locales (Flinders Range, Macdonnell Ranges) examining sedimentology, biostratigraphy, taphonomy of multicellular eucaryote assemblages. Field guide prepared. Detailed photography of locales and stratigraphy. Met with local community groups to plan how public outreach centers, educational material could be prepared concerning the Precambrian sequence in the Flinders. Discussed and proceeded with plans to study new material available from the Flinders sequence and to open up a quarry in the Cambrian in cooperation with the South Australian Museum.
- Determination of student projects that can be offered to Ph.D. candidates in 2004.
- Field trip to Namibia, conference in Cape Town, South Africa; meet primary and secondary education staff at Monash University, Johannesburg campus to plan education kits on the Precambrian sequence for pre-Tertiary students.. Visit to Namibian Geological Survey in Windhoek (Dr Gabi Schneider).
- Preliminary report on comparisons between the two most biodiverse Vendian assemblages (Flinders Range and White Sea) and determination of detailed projects to be undertaken over the next 4 years.
- Collaborative work on ***popular book*** describing biotas of the Precambrian as well as ***touring exhibition***, the book due for submission in 2004, the exhibition to be launched in 2005 in cooperation with the Monash Science Centre (Melbourne), the Queen Victoria Museum (Launceston, Tasmania) the South Australian Museum (Adelaide), and the Paleontological Institute (Moscow) and the Namibian Geological Survey
- Set up website for IGCP493
- Participation in two conferences for public/educational outreach to disseminate cutting edge research. STANSW (Science Teachers Association of New South Wales Annual Conference – keynote address by Fedonkin, Gehling and Vickers-Rich and 4 workshop sessions), Dec. 2003; keynote address by Vickers-Rich at *Science in the Middle Years Conference*, University of Queensland, Oct. 2003).
- Preparation for IGCP493 one day workshop to be held at the Monash University Prato Campus in conjunction with the International Geological Convention in Florence, Italy (Aug. 2004)
- Preparation for field work in Siberia by international team from Australia and Russia in 2004