IUGS elects new officers

At the 1st Ordinary Session of the merged IUGS/IGC Council, held in Florence, Italy, in conjunction with the 32nd International Geological Congress (IGC), the following new officers were elected:

President
Prof. Zhang Hongren (China)

Secretary General
Dr. Peter T. Bobrowsky (Canada)

Treasurer
Prof. Antonio Brambati (Italy)

Vice-Presidents
Prof. Eldridge M. Moores (USA)
Prof. Sylvi Haldorsen (Norway)

Councilors (2004–2008)
Prof. Ryo Matsumoto (Japan)
Dr Gabriele I.C. Schneider (Namibia)

Councilors (2006–2010)
Prof. Mikhail A. Fedonkin (Russia)
Prof. Marta S.M. Mantovani (Brazil)

Two current councilors, Prof. Jean-Paul Cadet (France) and Prof. Alberto C. Riccardi (Argentina), who were elected by the Council in Rio de Janeiro (2000), will complete their four-year terms of office in 2006.

In remarks following his election, during the IGC Closing Ceremony, Zhang said:.

"It is a great pleasure for me to have the opportunity to serve the international geological community, and on behalf of the new IUGS Executive Committee I would like to thank all the participants in this Congress for their support."

"It is a little bit too early to speak about our plan for the future. The immediate task is to identify the priorities of the IUGS in the coming four years. The financial resources of the IUGS are rather limited and must be oriented to the most important items. Four years is a short period of time. Our achievements will be highly dependent on the support of the world geological community. We do hope that geologists all over the world will offer suggestions concerning IUGS priorities."

"The energy of our Union resides in its unity. Only through united effort can the Union play a significant role in the advancement of geological sciences. The IUGS can never be an independent kingdom. The support of member countries is indispensable. Many geological activities are financed by governments and are in the interest of the public. Although the IUGS is a non-governmental organization, support from the governments and geological surveys of our member countries is crucial. On the other hand, the contribution of IUGS to the member countries can be realized also only through their governments and/or geological surveys. In my opinion, it is very important to establish and maintain a healthy relationship with them. To that end, in the near future, members of the IUGS Executive Committee will contact all of our member countries."

Warm congratulations to the new IUGS President, Prof. Zhang Hongren, at the 32nd IGC. (Photo coutesy Dong Shuwen)

Prof. Zhang Hongren

"Personally, over the last 12 years, I constantly felt such international support during my work on behalf of the the 30th IGC and the production of *Episodes*. At the opening ceremony of this 32nd International Geological Congress, the Minister of Land and Resources of China made the commitment to a greater contribution in promoting the development of world geosciences."

"The work of the new Executive Committee will build on the remarkable contributions of our predecessors. From the time when I became involved in planning the 30th International Geological Congress, held in Beijing in 1996, I had the opportunity to work with the presidencies of William Fyfe, Robin Brett, and Eduardo de Mulder. The new Executive Committee will augment their manifold accomplishments, including advancing the International Year of Planet Earth initiative. I would like to take this opportunity to express our sincere respect and thanks to all of our predecessors."

"I would also like to thank our Italian hosts for their immense efforts in staging this very well organized and highly successful Congress here in the artistic and historic city of Florence. We shall remember forever this Congress and this beautiful city. Our admiration and gratitude to Professor Boriani and his colleagues are boundless. We assure them that we leave Florence with a deep affection for Italy and the Italian people."

Source: *IUGS Website*

Three "first places" for Ediacaran Period

Definition of a new geologic period for the last interval of the Proterozoic Eon, the Ediacaran, was recently ratified by the IUGS. The Ediacaran Period is the first Proterozoic period to be recognized on the basis of chronostratigraphic criteria, the first internationally ratified, chronostratigraphically defined period of any age to be introduced in more than 120 years, and the first to be defined by a "golden spike" in the Southern hemisphere.

The beginning of the Ediacaran Period is defined as the base of the Marinoan cap carbonate (Nuccaleena Formation) in the Enorama Creek section of the central Flinders Ranges, Adelaide Rift Complex, South Australia. This time interval is now known as the Ediacaran Period, in recognition of its transcendent characteristic, the Ediacara Biota.

The Nuccaleena is the lowermost division of the 3-km-thick terminal Proterozoic Wilpena Group in the Flinders Ranges. It overlies a varied assemblage of glacial, glacial-marine and associated deposits assigned to the Elatina Formation (and correlative units) at the top of the Umberatana Group. The entire section, more than 8 km thick, from Sturtian glacial deposits in the lower part of the Umberatana Group, to the base of the Cambrian (top of the Wilpena Group), is exposed in a single west-dipping homocline, encompassing the Enorama Creek locality.

The main advantages of this section are clear paleontological, sedimentological and carbon isotopic context; expanded stratigraphic thickness; simple structure well known from both regional and local geological mapping; excellent exposure in semi-arid terrain; historical significance; and ease of access. In common with all of the prime candidates for a terminal Proterozoic GSSP, the main limitation of the Flinders Ranges is the absence of datable igneous rocks in the relevant portion of the stratigraphy. However, precise global correlation at the cap level using carbon isotopic data should eventually make it possible to constrain the age of the proposed GSSP. At present, the end of Marinoan glaciation is constrained from below by a 635.5±1.2 Ma U-Pb zircon age for an ash bed within glacial strata in Namibia (Hoffmann et al., in press). Post-glacial phosphorites in China have yielded a Pb-Pb age of 599±4 Ma, and a $^{40}Ar/^{39}Ar$ hornblende age of 580±7 Ma dates a volcanic flow just above the Marinoan glacial level in the western U.S.

The cap carbonate at the base of the Nuccaleena Formation is well exposed and easily recognized throughout the Flinders Ranges. Enorama Creek on the western flank of the ranges has the advantages of a simple structural setting, full stratigraphic context, ease of access, and the protection afforded by location within the Flinders Ranges National Park. The location, determined by stand-alone Global Positioning System, is Zone 54, 274825±5 mE, 6531235±5 mN (GDA 94), or 31° 19' 53.2" S, 138° 38' 0.2" E.

Access to Enorama Creek is by paved road from Adelaide, the closest city with an international airport, 400 km to the south, and by well-maintained unpaved roads within the Flinders Ranges National Park. It is less than a day's drive from Adelaide. The Flinders Ranges is a tourist region visited by tens of thousands of people every year. Motels, hotels, camping grounds and shops are available in several places. The tourist resort at Wilpena Pound provides a convenient local base.

The Marinoan is the last global glaciation of the Neoproterozoic, and as such marks a critical boundary in Earth evolution. Within the Flinders Rages, the post-Marinoan cap carbonate is a distinctive stratigraphic unit located at the base of the Nuccaleena Formation and locally within the correlative Seacliff Sandstone. It is well exposed and readily mapped over many hundreds of square kilometers. The carbonate is typically no more than a few meters thick and is composed primarily of finely laminated cream and pink microspar and dolomicrite.The most common facies consists of normally graded event layers (turbidites), in places arranged into constructional meter-scale tepee-shaped structures aligned parallel with paleocurrents. Less common, but found widely within the Nuccaleena and cap carbonates in general, are facies characterized by abundant sheet cracks, bedding disruption, brecciation, multiple generations of isopachous fringing cements and internal sediments, stromatolites, formerly aragonite and barite crystal fans and tube-like structures.

The carbonate is interpreted to represent a short-lived chemical oceanographic event accompanying Marinoan deglaciation and sea-level rise, and to be of global extent. This interpretation is supported by the recognition in the cap carbonate of a very distinctive carbon isotopic signature, with $\delta^{13}C$ values that decrease upwards from close to 0‰ at the base to values of –5‰ or lower. The emerging picture of cap carbonates as high-resolution global markers makes the Marinoan cap extremely attractive for defining a GSSP.

AS GSSP, the Enorama Creek section has several advantages as follows:

1) The base of the Nuccaleena is a well-defined surface, easily recognized throughout the Flinders Ranges. If related to glacial-isostatic rebound, the associated hiatus is likely to be limited in most places compared, for example, with the erosion surface beneath the Marinoan glacial rocks, because deglaciation was clearly associated with a marked rise in sea level.

2) The lateral variability of absolute $\delta^{13}C$ values in the cap carbonate is sufficiently great to cast doubt on whether nuances in isotopic data can be used objectively to establish time relations within the carbonate, although, globally, most sections preserve a record of comparable stratigraphic trends in secular variation. Although $\delta^{13}C$ values attain a minimum near the top of the cap carbonate in those sections elsewhere in which carbonate rocks persist up section above the cap level (e.g., northern Namibia and southern China), that minimum tends to be stratigraphically broad (tens of meters), and not useful for precise correlation.

3) The cap carbonate is thought to represent a chemical oceanographic event, and not simply a sea-level rise. There is no reason to regard the interval of maximum flooding (deepest water) within shales above the cap as having more than regional temporal significance. Nor is it possible to locate any particular distinctive horizon within that interval more objectively than the base of the carbonate.

Three distinct but causally related events mark the initial GSSP of the Ediacaran Period. First is the rapid decay of Marinoan ice sheets, clearly observed locally but documented globally. Second is the onset of sedimentologically, texturally, and chemically distinct cap carbonates, again recorded clearly in the GSSP but observed in many other basins. And third is the beginning of the distinctive pattern of secular change in carbon isotopes recorded in the cap carbonates, like the other events documented globally. Collectively, these features allow confident correlation between the GSSP and successions around the world.

Distinctive paleobiological signatures also mark the period thus defined. Phosphatized animal eggs and embryos are succeeded by the distinctive Ediacara Biota, which includes the earliest unambiguous remains of macroscopic animals. Among microfossils, a stratigraphic interval above the GSSP but below known occurrences of the Ediacara Biota is marked by a diverse assemblage of large, highly ornamented acritarchs. Along with C, S, and Sr isotopic profiles, these fossils offer high potential for formal stratigraphic subdivision of the Ediacaran Period.

Andrew H. Knoll
Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, MA 02138, USA.

Malcolm R. Walter
Australian Centre for Astrobiology, Department of Earth and Planetary Sciences, Macquarie University, Sydney NSW 2109, Australia.

Guy M. Narbonne
Department of Geological Sciences and Geological Engineering, Queen's University, Kingston, Ontario K7L 3N6, Canada.

Nicholas Christie-Blick
Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964, USA.