

تحت الرعاية السامية لصاحب الجلالة الملك محمد السادس

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The International Conference The Rise of Animal Life RALI2015

Promoting Geological Heritage: Challenges and Issues 05-10th October 2015 Marrakesh

Supporting organizers

United Nations, Educational, Scientific and Cultural Organization (UNESCO)
The International Geoscience Programme Project (IGCP 591)
The International Commission on Stratigraphy (ICS)
The International Union of Geological Sciences (IUG)

Abstracts and program

Cadi Ayyad University, Faculty of Sciences & Technics. Marrakesh

GENERAL INFORMATION ON RALI2015

The International Conference 'Rise of Animal Life: Cambrian and Ordovician biodiversification events. Promoting geological heritage: challenges and issues' RALI 2015 is organized by the Faculty of Sciences and Technics, Marrakesh, Department of Earth and Sciences, Cadi Ayyad University, Marrakesh (Morocco).

The formal theme of the meeting are devoted to 'Cambrian and Ordovician radiations'. In conjunction with the conference, a special symposium dedicated to aspects of Geological Heritage will be held and will highlight associated educational, cultural and socio-economic issues. The captivating City of Marrakech offers an ideal setting for scientific gathering. The « Red City » boasts an exceptional cultural heritage and remarkable natural surroundings such the snow-capped High Atlas mountains, and its beautiful palm gardens.

The scientific sessions are followed by a field trip as a 'Geotraverse of Central High Atlas and Anti-Atlas'. Besides its geological importance, the southern part of Morocco is one of the most attractive touristic areas. It shows diversified landscapes, from snowy mountains to desert plains. The High Atlas (3000-4000 m above sea level) forms a major climatic barrier to the Atlantic and saharian perturbations, which account for the arid climate of the Anti-Atlas sub-saharian domain south of the chain. This field trip will also offer participants the opportunity to visit fossil localities near Zagora, where the Fezouata Biota is currently being studied by an international team of scientists. In the Ternata plain (N. of Zagora), the Lower Ordovician succession (Fezouata Shale and Zini Sandstones) lies unconformably over the middle Cambrian Tabanite Group. The Fezouata Shale corresponds to a thick monotonous series (1000 m) of siltstones deposited under shallow offshore conditions (storm-wave influence).

The Fezouata Biota provides a unique insight into one of the most critical periods in the evolution of marine life: the Cambrian-Ordovician transition.

This international conference will focus on this crucial event, especially its timing, and possible processes and causes with special emphasis on the relationships between the 'Cambrian Explosion' and the subsequent 'Great Ordovician Biodiversification Event'.

Topical sessions

- Faunas, environments, triggers and drivers of the Cambrian and Ordovician biodiversification events.
- Cambrian and Ordovician exceptional biotas: taphonomy, palaeobiology, palaeoecology.
- Geological Heritage: challenges and issues.

Geo-tourism in the Arctic - challenges in a vulnerable environment.

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The Svalbard archipelago in the Arctic comprises the islands from 74° to 81°N, and from 10° to 35°E and are under Norwegian sovereignty. The Svalbard area displays a more or less complete stratigraphical succession with fossils ranging from the late Precambrian through to the Palaeogene.

The natural environment in Svalbard is high arctic and vulnerable and 65 % of the land area is protected as national parks. Activities in these areas are subject to special regulations.

The settlements in Svalbard (pop. ca. 2300 Norwegians) were initially based on coal mining activities and today two Norwegian mines are in operation, whereas Russian mine operates in Barentsburg (pop. ca. 500 Russians and Ukrainians). Mineral exploration plays a minor role. Ongoing geomorphological processes have an important part in this high arctic landscape especially linked to the many glaciers, glacier rivers and periglacial conditions.

Since 2004, a group of scientists, students and volunteers organized from the Natural History Museum (NHM), University of Oslo, has undertaken field work in the Isfjorden area exploring for Jurassic and more recently Triassic marine reptiles and various invertebrates. The findings have caused international scientific and media interest and the Upper Jurassic black shales containing these fossils might be considered a Lagerstätte of high scientific value. The field group has been sponsored by various geological companies, as well as a local tourism agency which in return has transported tourists into the field area. The visitors, including visiting school teachers and local guides have met the scientists, they have learnt how scientific work is carried out, and they have been able to find fossils. Some work is done in co-operation with Svalbard Museum and the University Studies in Svalbard (UNIS).

Svalbard attracts an increasing number of tourists every year, and there are organized day, week and longer trips. The tourists are offered year-round activities like kayak and boat trips, glacier and mountain trekking, ice cave climbing, ski expeditions, dog sledge trips, snow mobile trips, and fossil collecting. “Hotel-nights” in Longyearbyen increased from 23.000 in 1993 to more than 82.000 in 2010. “Landed” tourists from cruise ships: 40.000 in 1996, over 100.000 in 2010.

Discussions on erecting a national geopark in the Longyearbyen area started in 2010. An initial note involving various participants discussed some aspects of such a geopark:

- A geopark’s contribution to tourism, business and economic life in Svalbard
- Longyearbyen’s geological, landscape and cultural history qualities
- Local geology based industry
- Sustainability and the role of national parks
- Problems related to collecting and selling fossils

These and other aspects on experiences and challenges in this remote part of the world will be discussed in the lecture.

Protection of geological sites in an urban area of Norway – results and future issues

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The two counties Oslo and Akershus cover an area of 5.372 km² (1.4 % of Norway) with a population of nearly 1.2 mill. (20 % of the total population). Central in these two counties is the Oslo rift structure, active from late Carboniferous and into the Permian. The Oslo fjord follows the rift fault lines. In the graben depression sedimentary rocks from the early Palaeozoic are preserved. Within the rift magmatic rocks (lavas and plutonic rocks) dominate and on both sides of the rift we find Precambrian gneisses. The last ice age has left its imprint on this landscape. Due to glacio-isostatic depression and rebound we find a marine limit of about 200-220 m above today's sea level and the occurrence of major glaciofluvial drainage has resulted in large areas with marine clays, now our main agricultural areas.

Geoconservation has been conducted here since the late parts of the 20th Century. Several protected areas have been established and can be classified as:

- Sedimentary rock sites, usually rich in Lower Palaeozoic fossils (natural monuments and nature reserves)
- Quaternary sites (gullies in marine clays, ice marginal features etc.) (nature reserves and landscape protected areas)
- General bedrock sites (lava flows, gneisses, mineral sites)

The priority in the 1970's – 80's and 90's was to establish the selected protected areas, but little effort was put into the management of them. The need for management has been given higher priority and master plans for management of protected areas are made and will guide the practical management. One project covering more than 30 protected geosites was finished in 2014, and a report was provided on how the management should be carried out. These sites are mostly stratigraphic (fossil) sites. The main problem on these sites is that they are gradually being overgrown and difficult to access and study. Most geological values are, however, intact, even if they are situated in areas with a high urban pressure and intense use as recreation areas. All sites are marked with governmental signposts, but the general level of information can be improved. The use of these areas and the urban pressure is still growing and the management faces a challenge to keep them in a good and hopefully even improved state for the future.

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