



2004 Meeting Report Form Re: UNESCO-IUGS Contract and IUGS Supplementary Contribution

Project Number and Title: **467: Triassic time and correlations**

MEETING: International Meeting and Field Workshop on
TRIASSIC STRATIGRAPHY OF THE HIMALAYAS (SPITI, INDIA)

Date: June, 25 – July, 6, 2004

Place: Manali, Himachal Pradesh, Spiti, India

Itinerary: 25.6. Travel New Delhi—Manali

Meeting: 26.—27. 6. 2004 in Manali, Himachal Pradesh

Field Workshop: 28. 6.—3. 7. 2004 in Spiti

4. 7./5. 7. Travel/ Stay in Manali

6. 7. Travel Manali—New Delhi

SCOPE AND RESULTS OF MEETING:

Scope of Meeting (program or outline of geological study)

This meeting was co-sponsored by IGCP 467, Subcommission on Triassic Stratigraphy, the Austrian Academy of Sciences (Committee for IGCP), and the Geological Survey of India.

Richly fossiliferous strata are well exposed at many places in the Tibetan or Tethys Zone of the High Himalayas throughout India, Nepal and China (Tibet). Long term studies of sections in Spiti have led to a large amount of new faunistic and stratigraphic data and provide a critical basis for documenting Lower and Middle Triassic deeper marine faunal diversity as well as pelagic faunal events across all stage boundaries from the base of the Lower to that of the Upper Triassic.

Highlights:

June, 26-27: Meeting at Manali

June, 30: All-day field-excursion to Guling (middle Pin Valley) by jeep, evening return to Kaza

- P-T boundary with brachiopod-bearing Kuling Shales (Gungri Formation, Wuchia-pingian) overlain by ammonoid-conodont rich *Otoceras* Beds (Griesbachian)
- Griesbachian-Dienerian boundary in ammonoid-conodont bearing “*Meekoceras*” Beds
- Olenekian (Himalayan *Hedenstroemia* Beds and Niti Limestone), Anisian to Ladinian sequence overview
- Upper Ladinian *Daonella* rich Kaga Formation
- Ladinian-Carnian boundary beds with detailed ammonoid-daonellid-conodont record Beds

July, 1: All day field excursion to Muth (upper Pin Valley) by jeep, evening return to Kaza

- Induan-Olenekian boundary beds within ammonoid-conodont controlled *Hedenstroemia* Beds
- Olenekian-Anisian boundary in conodont –bearing top of Niti Limestone
- Anisian to basal Upper Ladinian Ammonoid succession of “Himalayan Muschelkalk”
- Lower Carnian detritics (“Grey Beds”) with presence of Reingraben (anoxic) event (Mikin Formation)

July, 2: All day field excursion to Muth (upper Pin Valley) by jeep, evening return to Kaza

- alternatively social program (visit of tourist sites)
- Ladinian-Carnian boundary succession at Muth

- Fossil collecting opportunity (ammonoids, daonellids, brachiopods) in the Middle Triassic rocks at Muth
 - Upper Triassic (Norian) detritics (“*Juvavites* Beds”) along road, opposite of Tiling
- July, 3: Alternative field excursions to A) Ratang and lower Pin Valley
- Upper Carnian shallow water carbonates (“*Tropites* Limestone”) of Ratang Valley
 - Middle Norian Reef Limestone (“Coral L.”), Upper Norian detritics (“*Monotis* Beds”), Rhaetian sandstones (“Quartzite Beds”) and platform carbonates (Para L.) up to the T-J boundary along Pin Valley road and
- B) Lalung (Lingti Valley) with Anisian fossil collecting opportunity
- July, 4: Travel Kaza-Manali with sightseeing stops in Kibber (highest village in Spiti surrounded by Jurassic and Cretaceous rocks) and Ki Gompa (large monastery)

Achievements of Meeting

At this, the first 467 meeting in the region, new palaeontological and stratigraphic data sets from various classical places (Guling=“Kuling”, Muth, Lalung=“Lilang”) and key links for comparison to proposed GSSP candidates elsewhere for the Induan-Olenekian, Anisian-Ladinian and Ladinian-Carnian boundaries were presented ahead of participants having the opportunity to study the sections first hand. Eleven papers were presented and published in a special issue (No. 30) of the Triassic Subcommittee Newsletter Albertiana. (See <http://www.bio.uu.nl/~palaeo/Albertiana/E-Albertiana/albertiana30.pdf>)

Particular focus was on the Ladinian-Carnian boundary sections where there is a rare opportunity to compare the evolution of the ammonoids, conodonts and bivalves and to calibrate an integrated bio-chronostratigraphic scale. The distinction between key ammonoids and prospective index fossils *Daxatina* and *Trachyceras* poses a problem in poorly preserved specimens, whereas the FAD of the prospective conodont species *polygnathiformis* is associated with typical Ladinian ammonoid species; the bivalve *Halobia* also appears close to this boundary and affords a further guide fossil. The choice of a GSSP datum awaits comparison with the successions in New Pass, Nevada as well as further consideration of the sections in the Dolomites, northern Italy.

Outcome of Meeting

The meeting provided further impetus to complete the work on the Ladinian-Carnian boundary with many of the principal researchers on hand to see the prospective type sections. Furthermore, the possibility of a new proposal for defining the Induan-Olenekian boundary arose based on rich pelagic faunas that are not so well developed in the Chinese candidate at Chaohu. The Upper Triassic mostly shallow water and mixed siliciclastic-carbonatic deposits of the area also have the potential to serve as a Himalayan (and southeastern Tethys) sequence-stratigraphic reference.

Signature of Project Leader and Date

M. J. Orchard
25 November 2004