

SUBCOMMISSION ON TRIASSIC STRATIGRAPHY

ANNUAL REPORT 2004

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

International Subcommittee on Triassic Stratigraphy

SUBMITTED BY (with contact information)

Dr Michael ORCHARD, Chairman

101-605 Robson Street,

Vancouver, BC, V6B 5J3

Canada

Tel. ** 604 666 0409

Email morchard@nrca.gc.ca

2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Rationalization of global chronostratigraphical classification.

Intercalibration of fossil biostratigraphies, integrated zonations, and recognition of global datums.

Establishment of magneto- and chemo-stratigraphic scales.

Definition of Stage boundaries and selection of global stratotype sections.

Correlation of Triassic rock successions and events, including marine to non-marine.

Climatic evolution and modeling.

The objectives satisfy the IUGS mandate of fostering international agreement on nomenclature and classification in stratigraphy; facilitating international co-operation in geological research; improving publication, dissemination, and use of geological information internationally; encouraging new relationships between and among disciplines of science that relate to Triassic geology world-wide; attracting competent students and research workers to the discipline; and fostering an increased awareness among individual scientists world-wide of what related programs are being undertaken.

3. ORGANIZATION

STS is a Subcommittee of the Commission on Stratigraphy.

Officers (chairman, two vice-chairmen, secretary), Editor/ Webmaster of newsletter *Albertiana*, voting members (24), and corresponding members (~100). The Secretary hosts a web site for STS announcements and task group discussions.

Subcommittee members represent a broad spectrum of specialized stratigraphical disciplines from those countries or regions where Triassic rocks are extensively studied in relation to fundamental and/or applied geological research. Current research activities and future plans are communicated through publication of the bi-annual STS newsletter *Albertiana* as both hardcopy and web release.

For election of the new executive (below), titular members were invited to propose candidates for Chair and Vice Chair. The incumbent was proposed as continuing Chair and one candidate as Vice Chair; the Chair invited a new secretary to stand. A postal vote was arranged by the past Secretary amongst the titular members and each candidate received at least 60% approval. A new voting list 2004-2008 was achieved through communications with the Executive and all Voting Members.

3a. Officers for 2004-2008:

Chair: Dr. Michael J. Orchard, Canada
Vice-Chair: Prof. Yin Hongfu, China
Vice-Chair: Prof. Marco Balini, Italy
Secretary: Prof. Christopher R. McRoberts, USA

Include WEB address for Subcommission site; and indication of contents

<http://www.bio.uu.nl/%7Epalaeo/Albertiana/Albertiana01.htm> - Albertiana issues for access and download.

<http://paleo.cortland.edu/sts/> - STS information, task group discussions.

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

IGCP Project 467: Triassic time and trans-Panthalassan correlations

IGCP Project 458: Triassic/ Jurassic Boundary Events.

CHRONOS/ SPS: co-sponsors of Wuhan meeting 2005.

InterRad group: Joint meeting planned for 2006.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2004

Three issues of **Albertiana**, the official newsletter of the Triassic Subcommission, were published in 2004. The primary aim of **Albertiana** is to promote the interdisciplinary collaboration and understanding among members of the Subcommission and within this scope serves as a platform for announcements, meeting reports, business minutes, reviews, and Triassic literature compilations as well as preliminary notes, progress reports, and articles on Triassic research. Electronic versions are also available in PDF format at <http://www.bio.uu.nl/%7Epalaeo/Albertiana/Albertiana01.htm>.

Albertiana 29 (63 pages) was published in April 2004. It includes several papers on the Lower Triassic, including a proposal for a I-O GSSP at Chaohu, China; a summary of conodont biostratigraphy in that area; and an account of Olenekian ammonoids in South Primorye. Also new data on the A-L boundary at Bagolino, and new Triassic bibliography.

Albertiana 30 (55 pages) was published for the Spiti Field Meeting in July/ August, 2004. It contains 8 abstracts from the meeting, and articles representing a field guide to the region, including sequence- and litho-stratigraphic revisions, and details of the biostratigraphy of the I-O, O-A, and L-C boundary successions in Spiti.

Albertiana 31 (83 pages) was published in November 2004. It contains the abstracts of the Florence workshop, and papers on P-T boundary magnetostratigraphy, I-O boundary ammonoids, O-A biostratigraphy in South Primorye, Late Triassic extinctions, and Triassic fill of a J-K impact crater in the Barent Sea.

A **field workshop** in the Himalaya of **Spiti**, India, was held 26th June-6th July 2004. This was co-sponsored with IGCP 467, the Indian Geological Survey, and the Austrian Academy of Science, and

was organized jointly by members of Vienna (L. Krystyn), Milano (M. Balini) and Delhi Universities (D.B. Banerjee), and by O.M. Barghava (Chandigarh) with the official support of state of Himajal Pradesh government. During the Manali meeting, attended by 25 scientists from 10 countries, 12 talks were presented and a business meeting held (June, 26). Major topics were the biostratigraphy of time-diagnostic fossil groups across Triassic stage and substage boundaries (Gangetian-Dienerian, Induan-Olenekian, Olenekian-Anisian, Ladinian-Carnian, Carnian-Norian) and a general introduction into the Triassic stratigraphy of Spiti. This was followed by a 8-days bus/jeep tour to Spiti where the classic Triassic sections of Muth and Kuling were visited. Emphasis was on ammonoid-conodont- (and in part brachiopod-) bearing Induan-Olenekian, Olenekian-Anisian, Anisian-Ladinian and Ladinian-Carnian boundary intervals. A special issue of *Albertiana* (#30) was published in which 8 abstracts and 3 articles were published. The Spiti sections are relatively condensed and rich in fossil fauna and are identified as a potential reference for the I-O boundary, particularly as they contain conodonts indicative of a more pelagic environment than Chaohu.

One further outcome of the meeting was the initiation of a multidisciplinary Indo-western cooperation project, called informally “High-resolution Triassic palynostratigraphic time scale of eastern Gondwana basins and margin”, under the umbrella of the IGCP. Scope of the project is to date and correlate more precisely the large continental and marginal marine Triassic series of eastern Gondwana between India and Australasia.

A conodont workshop took place during the Spiti meeting. Discussions on the taxonomy and stratigraphy of boundary-diagnostic conodont biomarkers, especially the species *Polygnathiformis*.

At the **International Geological Congress** held in Florence, Italy, August 20-28, 2004, the Subcommission sponsored a symposium G22-06: Triassic in Tethys Realm, and a workshop DWO-09: Upper Triassic boundaries. STS members were also involved in T-04-02: Permian-Lower Triassic events and T-04-03: Triassic-Jurassic boundary events. Workshop DWO-09 attracted up to about 50 participants who enjoyed lively presentations and discussions on topics relating to correlation and definition of the base Carnian, Norian, and Rhaetian stages of the Upper Triassic. The abstracts from the fourteen talks/ posters are reproduced in *Albertiana* #31.

An **STS website** was established by the new STS Secretary. This complements the *Albertiana* website by providing information on the Subcommission and its members, task groups, meetings, and especially as a host to discussion notice boards for each of the current boundary task groups.

<http://paleo.cortland.edu/sts/>

Organization of future meetings took place:

Wuhan, China Meeting, May 2005. 2nd Circular published in *Albertiana* 29

Wellington, New Zealand, March 2006. 1st Circular published in *Albertiana* 29.

Svalbard, 2006. An organizing committee was established and a preliminary program formulated.

A proposal for the **Induan-Olenekian** (I/O) boundary GSSP at the Chaohu section in Anhui Province of East China, within the low-latitude Tethyan Realm, was published in *Albertiana* #29. The I/O boundary in Siberia and northern Far East is usually marked by the first appearance datum (FAD) of *Hedenstroemia*, an ammonoid which occurs commonly in these regions, but which is rare in the Canadian Arctic and southern Far, and not known in the South China and other low paleolatitude regions. The I/O boundary in South China is marked by the FAD of flemingitid ammonoids and far more abundant conodonts. In the Chaohu section, the FAD of conodont *Neospathodus waageni* subsp. is the preferred index to define the I/O boundary. This datum lies 26 cm below the FAD of the flemingitid ammonoids, and is located slightly prior to the top of the second Triassic normal magnetozone, and the peak of the first Triassic positive excursion of $\delta^{13}\text{C}$. Conodont biostratigraphy of Chaohu was summarized in *Albertiana* #29, and the ammonoids described in *Albertiana* #31.

After 2004 field work carried out in Muth, Spiti, evaluation of the Mikin Fm. for establishing an Induan-Olenekian boundary GSSP candidate was begun. The rocks are well exposed, and highly fossiliferous both in conodonts and ammonoids with documentation of top *Gyronites*, complete *Flemingites* and basal *Euflemingites* intervals. Three boundary options based in ammonoids are: (1) the FO of *Flemingites* s.l. = *Rohillites rohilla*, (2) the FO of *Flemingites griesbachi* and (3) the FO of *Euflemingites*. These events can be tied to the FAD of *Neospathodus waageni* subsp. The merits of the Muth section are under consideration.

The field meeting and conodont workshop in St Christina last year generated an informal agreement on using the appearance of the conodont *Chiosella timorensis* at Desli Caira, in Dobrogea, Romania as the GSSP for the **Olenekian-Anisian** boundary. Since then, further geochemical work was undertaken to fill a perceived gap in the coverage at the principal section. Biostratigraphic work is in progress on the ammonoids and nautiloids, while the conodont succession remains to be described in detail. Further work has been undertaken on correlative sections in South China, Spiti, and South Primorye, Russia.

Following the publication of alternate GSSP proposals, an initial vote within the **Anisian-Ladinian** task group first eliminated one option, but was subsequently inconclusive between the remaining two, with 9 votes in favor of the base of the Curionii Zone at Bagolino, and 5 in favor of the base of the Reitzi Zone s.s. at Felsoors. In order to overcome this historical impasse, the Chairman canvassed the titular members of the STS for their view on whether it was appropriate to accept the majority task group view. Those results became available in May with 68% of respondents supporting this approach. Therefore, the proponents of the Curionii datum were invited to prepare a full and final proposal for the GSSP and this was sent out to voting members of the Subcommittee by the new Secretary in early September. The vote closed on 28 November with a 83% of respondents in favor of the GSSP defined at the top of "Chiesense groove", located about 5 m above the base of the Buchenstein Beds at Bagolino, northern Italy; the lower surface of the overlying thick limestone bed has the lowest occurrence of the ammonoid *Eoprotrachyceras curionii*. Secondary global markers in the uppermost Anisian include the lowest occurrence of conodont *Neogondolella praehungarica* and a brief normal-polarity magnetic zone. The GSSP level is bracketed by U-Pb single zircon age data, indicating that the boundary age is within the range 240-242Ma. The completed proposal has been forwarded to the ICS for a vote. Integrated geochronology, biostratigraphy and magnetostratigraphy provide a reference frame for the Anisian/Ladinian boundary interval and a key constraint for interpretation of cyclicity in the Latemar carbonate platform succession.

Three widely separated areas are providing essential data on the **Ladinian-Carnian** boundary – the Dolomites in northern Italy, Spiti sections in India, and South Canyon in Nevada, USA. The section at Stuoures in Italy, the subject of an existing proposal, is now supplemented by new data from other sections in the Dolomites. Studies in Spiti are nearly over, with conodont sampling across the boundary interval having been made a total of four times; no new ammonoid discoveries having come to light during the last two expeditions. The distinction between key ammonoids and prospective index fossils *Daxatina* and *Trachyceras* is difficult 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 successions in New Pass, Nevada South Canyon remains to be fully documented to test the suitability of bioevents established in Spiti and the Dolomites.

Following the successful conodont workshop in Vancouver in 2003, new conodont zonation from a potential **Carnian-Norian** GSSP at Black Bear Ridge, Western Canada was presented during the IGC in Florence. New taxa and potential indices are recently recognized in both Europe and North

America. The succession of bivalve *Halobia* species in the boundary interval at Black Bear Ridge and elsewhere are well integrated with conodont, and less directly, with the ammonoid chronology.

The integrated bio-, magneto- and chemostratigraphic cross-correlation of key sections in the Tethys (Sicily, Slovakia, Turkey) show a concurrent datum plane somewhat above the current Norian ammonoid base. This level is reported to be marked by the appearance of *Epigondolella* cf. *quadrata*, a palaeomagnetic reversal, the onset of a positive $\delta^{13}\text{C}$ shift, and possibly to the FO of *Halobia styriaca*. A boundary study of promising siliceous deepwater facies in Oman unfortunately failed to provide reliable radiolarian faunas important for a correlation with the Panthalassa realm. Carnian-Norian conodonts from the Boreal realm in Siberia were reported for first time at IGC Florence and will be important in correlating Carnian-Norian boundary beds of low and high latitudes.

The Pizzo Mondello section in Sicily contributes a magnetostratigraphic profile tied to a preliminary conodont zonation for the C-N boundary interval in Tethys. This is crucial for marine-nonmarine correlations for the Late Triassic. Alternate views of this correlation with the cyclostratigraphically calibrated Newark non-marine successions, place the base of the Norian at about 214 Ma or 228 Ma. Advocates for both views made their case at the Florence IGC.

New data on the **Norian-Rhaetian** boundary from a 50 m thick boundary interval in the Zlambach Formation in Austria were presented at the Florence IGC. Ammonoids, pelagic bivalves, conodonts, radiolarians, and palynomorphs are known and a magnetostratigraphy is available. Despite unexpected ranges of some ammonoids and conodonts, a distinct dinoflagellate change that occurs midway through the section is widely recognized and could prove invaluable in distinguishing the Norian and Rhaetian in shallow marine and/or high latitude basins. Radiolarians need study but may prove crucial in correlation with western North America where radiolarians of the *Proparvicingula moniliformis* Zone provide the most distinctive faunal change for characterizing the base Rhaetian in the oceanic realm. This level corresponds also to the FAD of the conodont *Epigondolella mosheri* which approximates the Amoenum Zone in North America. *Misikella posthernsteini* is suggested as a Rhaetian equivalent in Tethys. Strongly contrasting magnetostratigraphic correlations of the marine defined Norian-Rhaetian boundary with the Newark astrochronologic time scale imply either a relatively short (2-3 My) or much longer Rhaetian Stage (6-7 My). A 30m thick top-Norian to Rhaetian Tethyan pelagic limestone succession has been drilled for magnetostratigraphy to resolve this. Preliminary isotopic data from North America suggests a long Rhaetian. A field workshop to the Gabbs Valley Range of Nevada will be held in March 2005 to resample the Norian-Rhaetian boundary which has been found to contain rare Tethyan conodonts.

The **Non-marine Group** continued to develop correlations, especially in North America, by the work of Lucas, Heckert, Lockley and Hunt. Work by Kozur in Europe and North America promises new conchostracan-based correlations. Members made presentations at the CHRONOS Workshop held in conjunction with the regional GSA Meeting in Boise, Idaho in May 2004 and at the IGC in Florence (Lucas, Kozur, Hancox, Olsen). The nonmarine working group is heavily involved in organizing and publishing the results of a theme meeting on the nonmarine Triassic-Jurassic transition, to be held in St. George, Utah in March 2005.

6. CHIEF PROBLEMS ENCOUNTERED IN 2004

The ability of the former STS secretary to function effectively continued through the first half of the year due to his retirement and departure from his institute. The Chair took up the slack, conducting votes etc.

The base Anisian deliberations within the task group remained contentious but the democratic principle prevailed through several successive votes.

Restructuring and fiscal restraint within the Chair's organization threatens to seriously impair his ability to fulfill his STS duties. General difficulty of financially supporting task group members to attend meetings.

7. SUMMARY OF EXPENDITURES IN 2004 (ANTICIPATED THROUGH MARCH 2005):

| ICS FUNDING | |
|--------------------------|--------------|
| Subcommission allocation | □3000 |
| IGC supplement | □1800 |
| TOTAL | □4800 |

| STS EXPENDITURES | |
|--|--------------|
| Albertiana - STS Newsletter | □1500 |
| STS website development | □ 600 |
| Support for Spiti meeting | □ 300 |
| Contribution to Chairman's IGC expenses | □ 350 |
| Contribution to STS members IGC expenses | □1600 |
| General office expenses | □ 100 |
| Support for Norian-Rhaetian task group meeting | □ 350 |
| TOTAL | □4800 |

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2005):

May 23-25 (May 23-June 1), 2005.

International meeting on Chronostratigraphy and Biotic Recovery. Wuhan, China; co-sponsored by STS, IGCP 467, CHRONOS, SPS.

Themes: 1. Triassic chronostratigraphy and GSSPs, especially Lower Triassic; 2. End-Permian mass extinction and Triassic recovery as well as related events; 3. Triassic paleontology and paleoecology; 4. Correlation between marine and continental Triassic.

Schedule: 21-22 May 2005 Pre-Symposium Field Excursion from Changxing to Nanjing

23-25 May 2005 Symposium in Chaohu, Anhui Province

24 May 2005 Morning: Mid-Symposium Field Excursion in Chaohu

Evening: CHRONOS Workshop

25 May 2005 Symposium in Chaohu, Anhui Province

26-30 May 2005 Post-Symposium Field Excursion 1 in Central and Western Guizhou

26-29 May 2005 Post-Symposium Field Excursion 2 in Southern Guizhou

26 May-1 June 2005 Post-Symposium Field Excursion 3 in Guizhou

Pre-symposium excursion: Permian-Triassic boundary sequence in Changxing, Zhejiang Province and Lower Triassic sequence in Nanjing, Jiangsu Province. Two-day field excursion to view the famous Meishan Section, where the GSSP of the Permian-Triassic boundary, and base Changhsingian are located; Lower Triassic sequence of different facies in Nanjing, which was a transitional facies between Meishan and Chaohu.

Mid-symposium excursion: Permian-Triassic boundary and Lower Triassic sequence in Chaohu City, Anhui Province. The proposed GSSP of the Induan-Olenekian boundary at the West Pingdingshan Section.

Post-symposium excursions: 1. Permian-Triassic boundary sequences across marine and continental facies in Central-Western Guizhou Province, including the Zhejue Section, proposed as a candidate of the terrestrial Permian-Triassic boundary stratotype; the field museum of the Guanling Fauna, which is a Ladinian-Carnian fossil assemblage typically composed of well-preserved marine reptiles and crinoids. 2. Permian-Triassic boundary and a Lower-Middle Triassic boundary sequence on the Great Bank of Guizhou in Southern Guizhou Province; end-Permian extinction and pattern of biotic recovery in shallow- and deep-marine facies of an isolated carbonate platform, the Great Bank of Guizhou, in southern Guizhou province; chronostratigraphically constrained Permian through Ladinian section with dated volcanic ash horizons bracketing the Olenekian-Anisian boundary. 3. Combination of 1 and 2.

The I-O boundary and substage division of the Lower Triassic will be focus of the Wuhan meeting. This will be a forum for presentation of biostratigraphic results from China, Spiti, and North America. Chemostratigraphic (stable isotopes) sampling is planned in Spiti for 2005. Anticipated presentation of Muth as an alternate GSSP candidate.

Compilation of the O-A GSSP proposal for Desli Caira.

Further work on ammonoid and conodont material from the L-C boundary sections in Spiti and particularly Nevada.

Synthesis of C-N data from Black Bear Ridge, BC and description of new conodont and bivalve taxa and zonation will be completed. Revision of relevant Tethyan platform conodonts has still to be completed for key sections in Sicily and Turkey.

Further work on N-R sections in Austria and Nevada. Investigations will attempt to show how a worldwide distinct dinoflagellate change correlates to conodont, ammonoid, and radiolarian bioevents and to palaeomagnetic and geochemical (stable isotope) profiles. New magnetostratigraphic data from a 30m thick top-Norian to Rhaetian Tethyan pelagic limestone succession will be published in 2005.

9. BUDGET AND ICS COMPONENT FOR 2005

| | |
|--|-------|
| Albertiana - STS Newsletter production | □1500 |
| STS website enhancement | □ 400 |
| Support for Wuhan/ China meeting | □1000 |
| Support for Wellington/ NZ meeting | □1000 |
| General office expenses | □ 100 |
| TOTAL | □4000 |

Potential funding sources outside IUGS

Cost sharing with IGCP Project 467, Triassic time and trans-Panthalassan correlation.

Department of Geosciences at the University of Utrecht provides facilities for the production of Albertiana and hosts its web-site.

National research and travel grants provide support to individuals, and host institutions provide in-kind support to the executive and task group chairs.

10. REVIEW CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2000-2004)

See Accomplishments in 2004 (above) for additional details.

Organization

Renewal of STS voting and corresponding membership in 2001. Voting membership was reduced from 31 to 26, and a broader geographical and disciplinary base established. This was the first significant turnover of voting members since the inception of the STS. A summary of all member's research interests was published in *Albertiana* 26. Four new GSSP Task Group chairs were appointed.

Meetings/ workshops

Field meeting in Tulcea, Dobrogea, Romania, 7-10 June, 2000. Prospective O-A boundary.

International Symposium on the Global Stratotype of the Permian-Triassic boundary and the Paleozoic-Mesozoic events. Changxing, South China, August 2001

International Conference in Oman: Permo-Triassic deposits: from shallow water to base of slope.

Field workshop on Middle Triassic boundaries, Veszprum, Hungary, September, 2002.

Extinction events, faunal turnovers, and natural boundaries within and around the Late Triassic.

Vancouver, Canada. May 25th -28th, 2003. Conodont workshop on the Carnian-Norian boundary.

Triassic geochronology and cyclostratigraphy a field symposium, September 11th -15th 2003. Focus on Secada core research and Middle Triassic time scales. Conodont workshop on the Olenekian-Anisian boundary.

Field workshop in Spiti, India, 26th June-6th July 2004. Conodont workshop on the Ladinian-Carnian boundary.

International Geological Congress, Florence, Italy, August 20-28, 2004. G22-06: Triassic in Tethys Realm; DWO-09: Upper Triassic boundaries.

Publications

8 issues of *Albertiana* (#24-31) were published in 2000 thru 2004. Each of these issues were made available for download from the web.

Abstract volumes/ field guides prepared for meetings in Romania, Oman, Stuares, Felseors, Vancouver, St Cristina, Spiti.

Task groups

The Permian-Triassic boundary was agreed and ratified: the first appearance of the conodont *Hindeodus parvus* in the middle of bed 27, within the Yinkeng Formation at Meishan, Changxing County, Zhejiang Province, South China. A formal celebration at the GSSP took place during August 2001.

The Induan-Olenekian boundary Task Group, formed in 1997, reviewed the options for a GSSP in the Russian Far East but found them lacking. A section in Chaohu, Anhui Province, China became the focus of intensive study. Ammonoid and conodonts biostratigraphy, magnetostratigraphy, and chemostratigraphy were undertaken. The FAD of the conodont *Neospathodus waageni* was identified as a potential GSSP datum, corresponding to the base of the *Flemingites-Euflemingites* ammonoid zone, and falling within a brief zone of normal magnetic polarity.

A field workshop was held at Desli Caira, in Dobrogea, Romania, in June 2000, to view the Olenekian-Anisian boundary candidate. Major work was undertaken on ammonoid, nautiloid, conodont, and foraminiferid biostratigraphy. Both chemo- and magneto-stratigraphic analyses were largely completed. At the 2003 field workshop in St Christina, a conodont workshop amongst task group members agreed that the appearance of the conodont *Chiosella timorensis* at the base of bed 7

was a suitable datum for GSSP definition. Isotopic dates from about this boundary in the Nanpanjiang Basin in South China fixed this boundary at about 247 Ma.

Intensive research was undertaken on Anisian-Ladinian boundary GSSP candidate sections in Italy and Hungary. A dedicated task group was formed in 2001 and presentations focused on the GSSP options in the Hungary meeting of 2002. A formal task group voting membership and a schedule for the choice of base-Ladinian stratotype was agreed at the St Christina Meeting in 2003, and three alternate proposals were published in *Albertiana* #28.

A field workshop in the Italian Dolomites focused on the section at Prati di Stuares, the subject of a formal Ladinian-Carnian boundary GSSP proposal in 1998. Fieldwork was carried out in two further regions of great relevance in Spiti and Nevada. Studies in Spiti have included four expeditions. A dedicated task group was established in 2001.

The task group on the Carnian-Norian boundary was established in 2001. Key sections in Canada, Sicily, Slovakia, Turkey, and Oman have been studied. Important magnetostratigraphic data was obtained and correlations to the Newark non-marine standard attempted. Conodont taxonomic issues were addressed in a Vancouver conodont workshop in 2003.

A Norian-Rhaetian boundary task group was formed in 2001. Sections in western Canada, USA, and Austria were studied and produced important ammonoid, bivalve, and conodont data. Magnetostratigraphic and chemostratigraphic studies were undertaken in North America.

11. OBJECTIVES AND WORK PLAN FOR NEXT 5 YEARS (2004-2008)

Meeting/field workshop schedule with themes and anticipated results.

May 23-25, 2005. Chronostratigraphy and Biotic Recovery. **Wuhan, China.** Joint meeting with IGCP 467. See section 8, Workplan.

March 19-24, 2006. Circum-Panthalassa Triassic Faunas and Sequences. *Te Papa Tongarewa*, Museum of New Zealand, in Wellington, **Wellington, New Zealand**. The conference is co-sponsored by InterRad, IGCP Project 467, the Subcommittee on Triassic Stratigraphy (STS), and the Institute of Geological and Nuclear Sciences (GNS).

Theme: Southern high latitudes Triassic correlations and trans-Panthalassan correlation.

Schedule: March 13-19: Pre-conference excursion 1. Northland and Auckland to Wellington via west coast Triassic localities (1A) or via central North Island volcanic and geothermal areas (1B)

March 19: Conference registration and ice-breaker

March 20-21, 23-24: Conference symposia and general sessions

March 22: Mid-conference Excursion 2. Wellington south coast

March 24-29: Post-conference Excursions 3, 4 and 5. Marlborough-Canterbury, Canterbury-Southland, Nelson.

Provisional symposia: The conference will be arranged as a series of symposia, which will begin with plenary talks. One of these will be on Triassic stratigraphy and biogeography

Pre-conference excursions: 1. Northland, March 13-16 (4 days). Permian-Triassic oceanic association of basalt, limestone, chert, and argillite (Waipapa Terrane), Permian-Triassic boundary succession. 2. Auckland-Taupo-Wellington (North Island), March 19-20 (3 days). Triassic-Jurassic oceanic association of pillow basalt, chert and argillite, Kawakawa Bay; 3. Auckland-Waitomo-Wellington, March 19-20 (3 days). Triassic-Jurassic oceanic association of pillow basalt, chert and argillite, Kawakawa Bay, followed by a western North Island excursion to examine late Triassic-earliest Jurassic volcanoclastic sections in Marakopa and Awakino areas (Murihiku Terrane).

Mid-conference excursions: Wellington south coast, March 22. Late Triassic accretionary wedge and associated oceanic sediments (Torlesse Rakaia Terrane) exposed along the Cook Strait coast. Leader:
Post-conference excursions: 1. Marlborough-south Canterbury (South Island), March 24-28. Ferry; 2 Southland (South Island), March 23-28. Early-Late Triassic neritic sequence in Southland Syncline along Otago coast (Kaka Point to Nugget Point) and inland in the Hokonui, Taringatura and Wairaki Hills (Murihiku Terrane); 3. Nelson (South Island). Poorly fossiliferous Early Triassic Maitai Group exposed in river sections near Nelson city and on D'Urville Island.

Latest August-earliest September 2006. The Boreal Triassic. Longyearbyen, **Svalbard, Arctic Norway.** Joint meeting with IGCP 467.

Theme: Northern high latitudes Triassic correlations and boundary recognition.

Location: The UNIS (University studies on Svalbard) Institute has agreed to host the meeting, and an on-ship excursion is planned.

Publications: Conference abstracts will likely be produced as an *Abstracts and Proceedings of the Geological Society of Norway* series. A proceedings volume in *Polar Research* is possible.

Excursions: ship based one day excursion to the famous Festningen section displaying the entire Triassic succession in sea-shore cliffs for all conference participants. Possibly a two days excursion to view some eastern developments of the succession in two localities, and optional helicopter based, non-coastal areas of Svalbard.

May, 2007. The Global Triassic. **Albuquerque, New Mexico, USA.**

Publication of the symposia proceedings, a volume on the Triassic timescale funded by New Mexico Museum of Natural History.

APPENDIX [Names and Full Addresses of Current Officers and Voting Members]

Subcommission officers (with addresses)

Chairman: M. J. Orchard, Geological Survey of Canada, 101-605 Robson Street, Vancouver, B.C. V6B 5J3, Canada, e-mail: morchard@nrcan.gc.ca

Vice Chairman: Yin Hongfu, China University of Geosciences, Yujiashan, Wuhan, Hubei, 430074, Peoples Republic of China. hfyin@cug.edu.cn

Vice Chairman: Marco Balini, Dipartimento di Scienze della Terra, via Mangiagalli 34, I-20133 Milano, Italy. Marco.Balini@unimi.it

Secretary/ STS web: Christopher A. McRoberts, Department of Geology, State University of New York at Cortland, P.O. Box 2000, Cortland, New York 13045 USA. mailto:mcroberts@cortland.edu

Albertiana Editor/ Webmaster: Wolfram M. Kuerschner, Laboratory of Palaeobotany and Palynology, Utrecht University, Budapestlaan 4, 3584 CD Utrecht, The Netherlands. W.M.Kuerschner@bio.uu.nl

Task Groups and their officers

Base Induan (Triassic): Yin Hongfu, China. hfyin@cug.edu.cn

Base Olenekian: Y. Zakharov, Russia. fegi@online.marine.su

Base Anisian: E. Gradinaru, Romania. egradin@geo.edu.ro

Base Ladinian: A. Baud, Switzerland. Aymon.Baud@sst.unil.ch

Base Carnian: M. Gaetani, Italy. maurizio.gaetani@unimi.it

Base Norian: M. Orchard, Canada. morchard@nrcan.gc.ca

Base Rhaetian: L. Krystyn, Austria. leopold.krystyn@univie.ac.at

Non-marina auxiliaries: S. Lucas, USA. SLucas@nmmnh.state.nm.us

List of Voting Members

TO COME