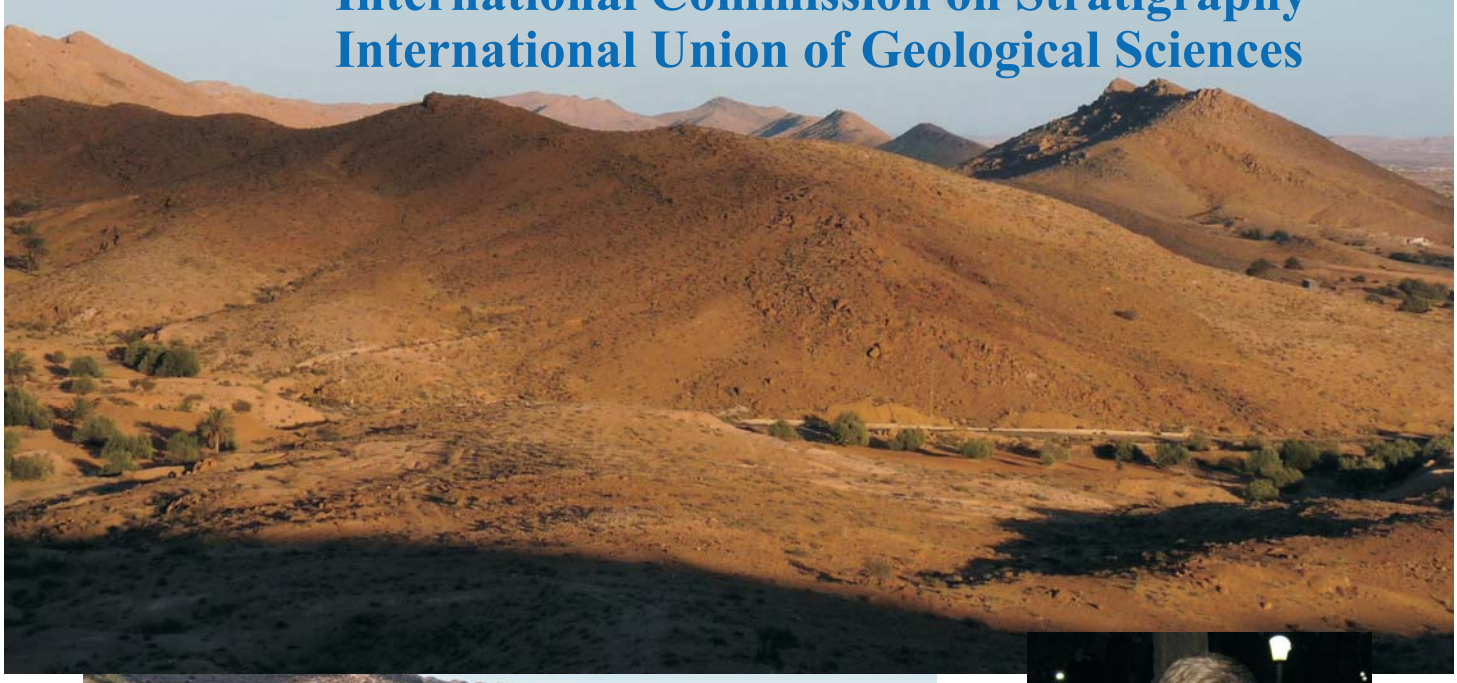
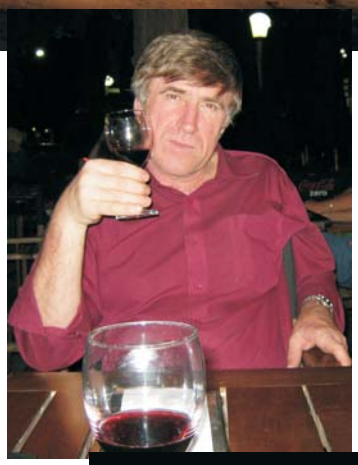
Permophiles

International Commission on Stratigraphy
International Union of Geological Sciences





http://www.nigpas.ac.cn/permian/web/index.asp

Newsletter of the
Subcommission on
Permian Stratigraphy

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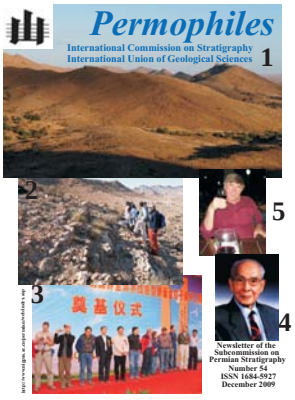
Contents



Explanation of cover, counterclockwise from top: 1) Permian rocks in Tunisia looking toward the east, 2) lots of help measuring sections in Tunisia, 3) GSSP ceremony at Laibin (see Executive Notes), 4) the late Prof. Zunyi Yang, and 5) the late Dr. Aleksandr Klets (see Memorials, p. 32)

EXECUTIVE NOTES

Notes from the SPS Secretary

Shuzhong Shen

Introduction and thanks

This issue was edited by Charles and I through email communication. Both Charles and I had international travels which conflict with our gathering in Nanjing as originally planned. I would thank Lucia Angiolini, Deepa Agnihotri, Aymon Baud, Changqun Cao, Chokri Chaouachi, Matthew Clapham, Vladimir Davydov, Valeri Golubev, Tatjana Grunt, Charles Henderson, Irfan U. Jan, Heinz Kozur, Ernst Leven, Alexsandr Markov, Sa'ad Zeki Al-Mashaikie, Giovanni Muttoni, Alda Nicora, Roberto Rettori, Anju Saxena, Qinghua Shang, Shuzhong Shen, A.K. Srivastava, Mike Stephenson, Roberto Rettori, Katsumi Ueno, Wei Wang, Xiangdong Wang, Yue Wang and Yichun Zhang for their contributions to this issue. Yin Hongfu, Igor Budnikov, Ruslan Kutygin and Leonid Peregoedov also provided memorials. I thank Christine MacLean for helping edit and typesetting this issue.

Previous and forthcoming SPS Meetings

There was no SPS business meeting held during the last half of 2009. However, an international workshop on the Precambrian-Cambrian and Permian-Triassic transitions was held in November, 2009, in Nanjing. About 50 colleagues from USA, Canada and China attended the workshop (see detailed the report in this issue by myself). A field excursion in the Three Gorges area and the Laibin area was organized before the workshop. It is especially noteworthy that a corner laying ceremony for the Lopingian-base GSSP was held on the Islet at Penglaitan, Laibin, Guangxi Province. The vice-mayor of the Laibin City, Mr. Chen Wei, SPS Chair Charles Henderson and Secretary Shuzhong Shen gave speeches at the ceremony. More than ten international colleagues attended the ceremony as well as many other local officials.

SPS does not have an official plan to hold a business meeting in the next half year. However, we have three opportunities to meet some SPS members in the near future. One is at the 6th International Conference on Brachiopoda, which will be held at the beginning of February, 2010 in Deakin University, Melbourne. As I know, a few SPS voting members including the organizer, Prof. Guang Shi, will attend the conference. Another opportunity is the workshop organized by the IGCP Project 572 in Oman at the end of February. Both Charles and I will join in the workshop and field trip. Finally, there will be a meeting of ICS at Prague May 30-June 3, 2010 and members are invited with some restriction in the overall number; please see ICS website for more information.

Permophiles 54

This issue contains the annual report of SPS by Charles, a report by the Working Group Neotethys, Paleotethys, and South China intraplatform basin, a report of the workshop on the Neoproterozoic-Cambrian and Permian-Triassic transitions by myself, a report by A.K. Srivastava et al. and two memorials. We lost two extraordinary paleontologists, Profs. Yang Zunyi and Alexander Klets, both made great contributions to Permian issues and Brachiopoda.

Future issues of Permophiles

The next issue of Permophiles is the 55th issue of Permophiles. Charles and I plan to edit Permophiles #55 in Calgary during middle 2010. We hope our colleagues in the Permian community can contribute papers, reports, comments and communications. The deadline for submission to Issue 55 is Friday June 11, 2010. Manuscripts and figures can be submitted via my email address (szshen@nigpas.ac.cn or shen_shuzhong@yahoo.com) as attachments. Please follow the format on page 3 of Issue 44 of Permophiles.

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Notes from the SPS Chair

Charles Henderson

I hope you enjoy Permophiles #54. SPS was very active in 2009 and my annual report indicates some of those activities. One of the highlights for me was the GSSP ceremony on November 12, 2009 in Laibin County for the base-Wuchiapingian (base-Lopingian Series). I would like to especially thank Shuzhong Shen for all of his time and effort to convince the Laibin local government and Bureau of Land Resources to commit to protect this site and show that commitment with a special ceremony. There has already been considerable effort in protecting this site with a stairway leading from where boats will dock and the beginning of the monument. The ceremony was very exciting with lovely young Chinese women in traditional dress and fireworks as well as a dancing dragon. It is not a requirement to "celebrate and protect" these GSSP sites to the extent that the Chinese people do, but I think we should be gratified that they do. It shows an interest in science that we rarely see in other countries these days. In a way we are celebrating a geologic decision more than the science, but it is only when we complete the GSSP process that we will have a stable Geologic Time Scale that will allow us to progress with some exciting science to better understand the evolution of the Earth and life on Earth. As we all know, it is difficult to get geologists to agree on an interpretation and to decide to move forward so it is worth celebrating when we do. However, these GSSP proposals are rarely supported unanimously, but the process is very

democratic and involves working groups, the subcommission, the International Commission on Stratigraphy and finally IUGS before they are ratified. I am a little disturbed when I see continued strong debate after this process and in some cases outright rejection. The debate regarding the Tertiary and Quaternary comes to mind, but there are other examples too. There is no room in the time scale for the Tertiary now that we have ratified increased precision with the Paleogene and Neogene; the Tertiary is gone like the Primary and Secondary before it. The Quaternary is here to stay after considerable debate, even though many believe the Neogene should continue to present day. In my view, we should move on and try to make these decisions work – and if they truly don't, then there are provisions to revisit. After all, they are only definitions. A dictionary is not an exciting read in any language – but those defined words can be combined into beautiful literature. The Time Scale is really a bunch of definitions that allow us to conduct exciting science within an established framework. I remember my first trip to China in 1987 when the Chinese had a very different definition for the base of the Permian than the rest of the world and I remember my first trip to Russia in 1991 when the biggest debate was whether the Permian should be divided into two or three series. Now we have a stable Permian time scale, for the most part, with a common base and three series. I think that is progress and worth celebrating!

We actually do still have some more work to do to complete the Permian GSSP process and that includes ratification of the base-Sakmarian, base-Artinskian and base-Kungurian. I am committed to help move this process toward completion before the next ICCP in July 2011 in Perth (see announcement elsewhere). To do so, I ask for your cooperation. The next Permophiles will have at least two revised proposals and I hope to get comments from the membership before SPS votes – the base-Kungurian will take a little longer (see Communications - next section).

I would like to thank Lucia Angiolini and Yue Wang for compiling the "Neotethys – Paleotethys - South China intraplatform basin correlations" working group report. I would like to especially thank Lucia who spent considerable time gathering views from many different geoscientists. This report highlights work completed and in progress in many different areas. The working group is charged with making the ratified parts of the Permian Time Scale work and I think you can see that progress is being made.

Finally, as noted by Shuzhong we have seen the passing of two colleagues. The first is Professor Zunyi Yang after a very long and productive life. Professor Hongfu Yin has highlighted just a few of his many accomplishments in a memorial near the end of this issue. I met Professor Yang briefly on two occasions in Beijing in 1996 and 1999 and remember a wise man with bright eyes and wide smile. When someone dies after such a successful and long life, conducted at times through very trying conditions, we do not feel really sad, but rather we feel a desire to commemorate his life and look for examples to direct our own. In contrast, I was struck with profound sadness to hear of the sudden death of a new friend Dr. Aleksandr Klets who was nearly the same age as me. I have known Aleksandr for only a couple of years, meeting him during special excursions in the Sydney Basin and Patagonia that are reported in recent issues of *Permophiles* #50 and 53. I remember an enthusiastic paleontologist with lots of energy for life and a keen eye for a good photograph. Three of his colleagues tell us of some of his accomplishments in a memorial near the end of this issue. Information and some pictures were also provided by his friend and travel mate in Australia and Argentina, Dr. Alexander Biakov as well as his other new friends from the recent excursions. He made many contributions in his short life, but I am sure he had many more to make. The fact that his life was cut short is very sad indeed, but perhaps we can take inspiration, as we face the many challenges of our own lives, from his favourite saying – "nyet problem". Hopefully, as we move forward to understand correlation issues of bipolar brachiopods and Permian provincialism and connections with the Neotethys that there are "no problems" – just interesting challenges that can be solved with some exciting science, conducted professionally within a collaborative framework.

Finally, please note that the Permian Time Scale on page 40 is slightly revised from previous versions.

Steps leading to the GSSP site on Penglaitan Island on the Hongshui River.

Right: Base Lopingian GSSP ceremony

Left: Charles Henderson speaking at the GSSP ceremony with Shuzhong Shen translating.

Right: Dancing dragons at the GSSP ceremony

COMMUNICATION

To: Chair of Permian Subcommission
Professor Charles Henderson

August 24, 2009
Dear Prof. Henderson,

The Permian Subcommission of Russian Interdepartmental Stratigraphic Commission, and I as the Chairman of Russian Permian Subcommission are quite concerned about the status of potential GSSP of Sakmarian, Artinskian and Kungurian Stages of the Cisuralian Series proposed in the Urals. I'd like to remind you that Cisuralian Working Group lead by Dr. Chuvashov, was formed almost 20 years ago. About 10 years ago the markers for the boundary have been proposed and potential sections to establish GSSP have been chosen: the Kondurovka section for the base of Sakmarian Global Stage, the Dal'ny Tulkas section for the base of Artinskian Global Stage and Mechetlino section for base of Kungurian Stage. The progress, however, is so little over this significant time and our geological and stratigraphic communities are quite disappointed with this fact.
I know you and your colleagues studied Apillapampa section in Bolivia in which the FAD *Sweetognathus merrilli* (or its homeomorphic form) has been found as low as middle Asselian. I also heard that these data were discussed in the SPS meeting at the ICOS conference in Calgary. We would like, first to learn what are the results of this discussion and how it affects the previous decisions. Second, we would like to know what SPS and you as the chair of the Subcommission think about potential GSSP and their perspectives.

Many thanks in advance
The Chairman of the Russia Permian commission
G. Kotlyar

To: Prof. Galina Kotlyar
Chair of the Russian Permian Commission

August 31, 2009
Dear Galina:

Thank you for your letter. You are quite correct that progress has been slow, but there have been several activities directed toward the three potential Lower Permian GSSPs (base-Sakmarian, base-Artinskian and base-Kungurian) since preliminary proposals were first outlined in Permophiles 41 (December 2002). At the time the preliminary proposals provided excellent biostratigraphic data, especially on conodonts and fusulinids, to support potential definitions for the stage boundaries. In order for proposals to successfully pass voting of the ICS and IUGS, however, there must be many other correlation tools employed to support the definitions and allow correlation away from the type regions. At least some of the following list of stratigraphic correlation tools must be provided for a proposal to be successful; this list includes various stable isotope geochemistry (Carbon, Strontium) methods, U-Pb geochronology on zircons from interbedded ashes (using modern standards, IDTIMS and high-temperature annealing techniques), and magnetostratigraphy. As you are undoubtedly aware, Mark Schmitz and Vladimir Davydov have presented many recent papers that demonstrate both high-resolution geochronology on ash beds and strontium isotopes on conodonts in the Asselian through Artinskian interval. These results have great potential to aid correlation away from the type regions and tests are currently being performed on conodont strontium values from mid-west USA and Arctic Canada material. Shuzhong Shen from Nanjing has recently provided (carbonate) carbon isotopic data across the potential GSSP sections at Kondurovsky (also Usolka), Dalny Tulkus, and Metchetlino. Tests for correlation are being completed by Kate Tierney of Ohio State University as part of her Ph.D. on material from the Pequop Mountains of Nevada. Shuzhong was not able to collect samples until a field excursion during the summer of 2007. This trip was delayed from 2006 by logistical issues in Russia. Furthermore, the 2007 trip offered me the opportunity to test the reproducibility of the definitions by collecting conodont samples (Shuzhong Shen collected matching material as well) from the appropriate beds under the direction of Valery Chernykh and Boris Chuvashov. The additional correlation tools and reproducibility tests mentioned above were absolutely essential for SPS to put strong proposals forward to ICS for voting. The results of these new data and tests are summarized below as are the recommendations by the SPS Executive following discussion at a business meeting held on July 14, 2009 in Calgary during ICOS 2009. These discussions are summarized in the most recent issue of Permophiles (#53; June 2009; see reports from the Secretary and Chair).

Base-Sakmarian
New data and tests
Excellent results have been obtained for conodont strontium, C (carb) isotopes, and geochronology of ash beds. The best results however have been obtained from the Usolka section. In particular, the Kondurovsky section lacks ash beds so the only geochronologic data for the interval is from the Usolka section. Kate Tierney has shown a similar C (carb) excursion in Nevada. My conodont samples from Kondurovsky were problematic. I did not find the index *Sweetognathus merrilli* in the designated bed. Furthermore, some beds contained numerous reworked conodonts and other beds yielded only juvenile specimens. Material from Usolka was excellent especially for the genera *Streptognathodus* and *Mesogondolella*, but the potential index species *S. merrilli* was not recovered. Furthermore, new results from the Apillapampa section in Bolivia, which yields abundant conodonts, interbedded with zircon-rich ash beds, demonstrates that forms comparable to *Sweetognathus merrilli* were present already in the mid-Asselian.

SPS Recommendations

1. Consider a new definition for the point, probably within the *Mesogondolella* lineage as defined by Chernikh given the proba-

ble diachroneity of the first occurrence of *Sweetognathus merrilli*. Chernikh hesitated to use *Mesogondolella* previously because the lineage was seemingly only present in the Urals, but new results demonstrate that it is present in Nevada, SE Alaska and possibly in part of Arctic Canada.
2. Using this definition would also require moving the section to Usolka rather than Kondurovsky. The former section has been studied extensively and has good geochronologic ages, as well as strontium and carbon isotopic data.
3. If the Russian committee decides that a new point and section as indicated above are acceptable, then a new proposal could be prepared and sent for voting by SPS as soon as possible (perhaps early in 2010). This proposal could include comparisons with the Kondurovsky section.
4. The Cisuralian committee was charged with too many tasks. ICS prefers that proposals be submitted individually, in any case. It may be useful to strike a new committee to complete this task. Valery Chernikh would be an important member of this committee and Boris Chuvashov should also remain a member, however it perhaps should be chaired by someone new, and possibly someone especially knowledgeable about those new data that need to be incorporated into the proposal. It would be good to get some younger scientists from Russia involved in this process as well.

Base-Artinskian
New data and tests
Excellent geochronologic ages and C (carb) and Sr isotopic data are now available for the Dalny-Tulkus section from Mark Schmitz and Shuzhong Shen. Furthermore, my samples did yield *Sweetognathus "whitei"* from the appropriate beds as well as numerous other conodont specimens. There is still one issue related to the taxonomy within the *Sweetognathus* lineage. The type *S. whitei* may differ from the definition as applied in the Urals by V. Chernikh. To this effect, I sampled in June the topotype locality of *S. whitei* in Wyoming USA and provided specimens to Mark Schmitz for Sr analysis in July during ICOS. This issue should be resolved within the next few weeks.
SPS Recommendations
1. This section is suitable for GSSP, especially if the exposure is improved.
2. A final GSSP proposal needs to be written and Vladimir Davydov and Charles Henderson are willing to help with this. A goal would be to complete this task before the end of 2009 and then immediately call for a vote.
3. The Chair of the Cisuralian Working Group, Boris Chuvashov, will remain as the senior author.

Base-Kungurian
New data and tests
Results from the Metchetlino section are not promising. Ash beds have not provided any meaningful ages and zircons are likely all reworked. The lithology is so deeply weathered that carbon isotopic data are inconsistent because of diagenetic alteration. Conodont samples from the potential boundary interval were mostly barren in both Henderson's and Shen's samples. In four of my samples spanning the boundary, I obtained only a single conodont element from a bed below the boundary. This section has failed both in providing addition correlation tools and in reproducibility.
SPS Recommendations
1. Abandon this section as a potential GSSP. If no other section can be found then we may reconsider Metchetlino again. It would certainly be referred to in any subsequent proposal. However, there is interest to retain the point at the FAD of *Neostreptognathodus pnevi*.
2. Consider three sections in the USA as a potential GSSP including the Cassia Mountains of southern Idaho and the Rockland or Nine-Mile sections of the Pequop Mountains. The latter sections are especially promising because carbon isotopic data have been obtained by Kate Tierney and the conodont and fusulinid succession has been well worked out by Wardlaw, Henderson, and Davydov including the *N. pnevi* lineage.
3. The Cisuralian Working Group was charged with too many tasks. ICS prefers that proposals be submitted individually, in any case. It would be useful to strike a new committee to complete this task. Bruce Wardlaw has worked extensively on this interval and has agreed to Chair the Base-Kungurian GSSP Working Group.

The account above summarizes my view of the current status and progress toward the Lower Permian GSSPs. They represent my comments as Chair based upon recent discussions and in principle, if not detail, represent the views of the SPS executive including Vladimir Davydov (Vice-Chair) and Shuzhong Shen (Secretary) as well as myself. This document should be considered a draft and a request should be made to me before reproducing it in print form. It can be used as a point of discussion for the Russian Permian Commission and I would welcome feedback. Eventually, it would be good to publish a revised version of this communication in the next *Permophiles*.

Sincerely,

Professor Charles Henderson
Dept of Geoscience, University of Calgary
Chair, Subcommission on Permian Stratigraphy, ICS

More detailed explanation of the conodonts and a plate was sent by Charles Henderson to Valery Chernykh for comment. All specimens referred to were from a single sample in a section from Bolivia. All specimens are well preserved and the specimens of *Streptognathodus* are more abundant. Zircons from interbedded ash beds indicate that the sample is Asselian. His reply is below.

23 September 2009

Dear Charles,

After the attentive analysis of the images of conodonts from the Apillapampa section
(sample # 05) I can report to you the following.

1. General appearance of *Sweetognathus* species looks like Late Sakmarian – Early Artinskian. The Tastubian *Sw. merrilli*, *Sw. binodosus* have a carina, which is composed by 4 -5 nodules, Artinskian *Sweetognathus* species have 6-8 nodules.

2. Forms 05 and especially 08 are similar with *Sw. binodosus*, but they are Artinskian *Sw. binodosus*. Similar forms are given in my monograph 2006 year (plate XV, fig. 11, 12). They have more number of nodules and more regular construction and also existing a weak ridge on upper surface.
3. Form 09 – is transitional between Sw. anceps and Sw. whitei, but more close to last one.
4. Form 12 – is juvenile and looks like 08.
5. Form 07 – is new species from group Sw. expansus. Their difference from type species –
wide and rhomboid-long carina with very weak differentiation and existing median
ridge. I have not seen these forms in Uralian sections.
6. Form 18 – probably it is *Streptognathodus paraisolatus* (Chernykh, 2006, plate III, fig.1. This species should be Lower Asselian (zone glenisteri, it is next after isolatus zone).
7. Form 25 – it is *Str. longus* (Chernykh, 2006. Pl. III, fig. 7). This species is passed almost through entire Asselian. But, judging by the presence of relict nodules on the inside of platform, it is more probable, that it is also Lower Asselian form from the zone of *glenisteri.*

I think that forms 18 and 25 are reworked Lower Asselian, which very often can be seen among Lower Artinskian Sweetognathus in the Uralian sections as well.

I don't like to discuss the isotopic age here, but Artinskian (or Late Sakmarian) age of conodont's complex give a possibility for conclusion that isotopic data could be wrong.

With best wishes!
Valery

P.S. All above given conclusion's were discussed by members of Russian Commission on Permian system during meeting 30 September of this year (Kazan City). The official document will be sent you by Dr. Galina Kotlyar.

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Editor's note: I agree with Valery on taxonomic assessment and this apparent mixture of Asselian *Streptognathodus* spp. and Sakmarian *Sweetognathus* spp. is perplexing. However there are several consistent dates in the section and the Asselian geochronologic age must be regarded as correct.

Charles Henderson

To: Prof. Charles Henderson
Chair of Subcommission on Permian Stratigraphy, ICS

October 28, 2009
Dear Charles,

I am sending the results of the discussions at a business meeting held on September 30, 2009 in Kazan during the Second All-Russian Scientific Conference "Upper Paleozoic of Russia: Stratigraphy and facial analyses".
The Permian Subcommission of Russian Interdepartmental Stratigraphic Commission has discussed the SPS decisions concerning the Sakmarian, Artinskian and Kungurian GSSP.

About 10 years ago the markers for boundaries have been proposed and potential section to establish GSSP have been chosen: the Kondurovka section for the base of the Sakmarian Global Stage, the Dal'ny Tulkas section for the base of Artinskian Global Stage and Mechetlino section for the base of Kungurian Global Stage. Now in order for proposals to successfully pass voting of the ICS and IUGS, however, there must be many other correlation tools employed to support the definitions and allow correlation away from the type regions. Among them the various stable isotope geochemistry (Carbon, Strontium) methods, U-Pb geochronology on zircons from interbedded ashes and magnetostratigraphy are the most important. On this cause SPS has proposed the Usolka section for the base of Sakmarian Global Stage where the results have been obtained for conodont strontium, carbon isotopes, and geochronology of ash beds. The Kondurovka section lacks ash beds. Besides the FAD of marker *Sweetognathus merrilli* have been established in the middle Asselian from the Apillapampa section in Bolivia. SPS consider a new definition for the point, probably within the *Mesogondolella* lineage, which now is established in Nevada, SE Alaska and possibly in Arctic Canada.

After serious discussion the Russian committee decides that a new point and the Usolka section are acceptable. Professor Chernykh will report you his own considerations concerning the Apillapampa section. The Russian committee consider the Kondurovka section as a possible parastratotype for the base of the Sakmarian Global Stage.

SPS consider the Dal'ny Tulkas section is suitable for GSSP because the excellent geochronologic ages and carbon and strontium isotopic data are now available. It is necessary only the exposure is improved. The Russian committee agrees with SPS decision and will provide the access and safety of the section.

According to SPS decision the Mechetlino section as potential GSSP for the base Kungurian Global Stage is declined (rejected) because of the ash beds have not provided any meaningful ages and zircons are likely all reworked. The lithology is so deeply weathered that carbon isotopic data are inconsistent because of diagenetic alteration. Conodont samples from the potential boundary interval were mostly barren. However, there is interest to retain the point at the FAD of *Neostreptognathodus pnevi*. SPS considers three sections in the USA as a potential GSSP including the Cassia Mountains of southern Idaho and the Rockland or Nine-Mile sections of the Pequop Mountains. The latter sections are especially promising because carbon isotopic data have been obtained and the conodont and fusulinid succession has been well worked out.

The Russian committee and Cisuralian Working Group consider it is necessary to continue additional investigation from potential boundary interval in Mechetlino section. This summer the detail samples have been collected for conodont reproducibility, fixing transitional form from *N. pequopensis* to *N. pnevi* and providing additional correlation tools.

Sincerely yours

The Chairman of the Russian Permian Commission
G.Kotlyar

Editor's Note

Galina Kotlyar indicated in an email dated Oct 29, 2009 that "Drs. Chuvashov and Chernykh would like to continue the investigation in Mechetlino to receive the additional correlation tools". In a subsequent email I indicated that the SPS decision does not preclude additional work at the Mechetlino section, but that new work will go ahead at Rockland and Cassia Mountains. I further indicated that I may impose deadlines for the completion of the base-Kungurian. Galina Kotlyar agreed also on Oct 29, 2009 that it "will be right if you will impose deadlines for production of proposals for the base of Kungurian". She also indicated in an email Oct 30 that I could make public these communications in the next issue of Permophiles.

The end result of this excellent exchange is that we will revise the base-Sakmarian proposal to highlight the Usolka section and compare to the Kondurovsky section (the Russian committee may wish to name the latter as a parastratotype, but this is not necessary for ICS). The base-Artinskian proposal will be updated, but will proceed as initially proposed. The base-Kungurian is under reconsideration.

Charles Henderson

REPORTS

SUBCOMMISSION ON PERMIAN STRATIGRAPHY

ANNUAL REPORT 2009

1. TITLE OF CONSTITUENT BODY and NAME OF REPORTER

International Subcommission on Permian Stratigraphy (SPS)

SUBMITTED BY:

Charles M. Henderson, Chairman SPS
Department of Geoscience, University of Calgary,
Calgary, AB Canada T2N 1N4
Phone: 403-220-6170; Fax: 403-284-0074;
Email: charles.henderson@ucalgary.ca
Website: http://www.ucalgary.ca/conodont/

2. OVERALL OBJECTIVES, AND FIT WITHIN IUGS SCIENCE POLICY

Subcommission Objectives: The Subcommission's primary objective is to define the series and stages of the Permian, by means of internationally agreed GSSPs, and to provide the international forum for scientific discussion and interchange on all aspects of the Permian, but specifically on refined regional correlations.

Fit within IUGS Science Policy: The objectives of the Subcommission involve two main aspects of IUGS policy:

1. The development of an internationally agreed chronostratigraphic scale with units defined by GSSPs where appropriate, and related to a hierarchy of units to maximize relative time resolution within the Permian System; and

2. Establishment of frameworks and systems to encourage international collaboration in understanding the evolution of the Earth during the Permian Period.

3. ORGANIZATION

The Subcommission has an Executive consisting of a Chairman, a Vice-Chairman, and a Secretary; all three are Voting Members of the Subcommission. There are sixteen total Voting Members representing most regions of the world where Permian rocks are exposed. The objectives of the Subcommission are pursued by both stratigraphic and thematic Working Groups that are retired upon completion of their directed task. For example, the Working Groups on the Carboniferous-Permian Boundary, on the Guadalupian stages (Middle Permian), on the base-Lopingian boundary (base-Wuchiapingian Stage), and on base-Changhsingian have been retired upon the successful establishment of their defining GSSPs and ratification by IUGS. The current working groups include the following: 1. Cisuralian stages, 2. Continental Permian, 3. Transitional biotas as gateways for global correlation, 4. Neotethys, Paleotethys, and S. China Correlations, and 5. International Lopingian Working Group.

3a. Officers for 2008-2012:

Chair: Professor Charles M. Henderson, University of Calgary

Vice-Chair: Dr. Vladimir Davydov, Boise State University

Secretary: Dr. Shuzhong Shen, Nanjing Institute of Geology and Palaeontology

The SPS website is located at http://159.226.74.3:7006/web/index.asp. This site includes all back issues of *Permophiles* in downloadable PDF format (#1 in 1978 to #53 June 2009). A link to *Permophiles*/Permian research has also been established at www.ucalgary.ca/conodont/sps.

4. INTERFACES WITH OTHER INTERNATIONAL PROJECTS

The SPS interacts with many international projects on formal and informal levels. The SPS has taken an active role on the development of integrated chronostratigraphic databases by participating with CHRONOS and PALEOSTRAT (now GeoStratSys), which are NSF funded initiatives. Vladimir Davydov and Walter Snyder are concentrating on developing their system to include improved taxonomic dictionaries, database sharing and manipulation with PALEOSTRAT. The SPS is also involved in a NSFC supported study comparing the Proterozoic-Cambrian transition with the Permian-Triassic transition.

5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2009

GSSPs: Progress was made on the three remaining Lower Permian (Cisuralian) stage GSSPs including base-Sakmarian, base-Artinskian, and base-Kungurian. Samples collected during an international field excursion conducted in early July 2007 (reported in *Permophiles* #49; p. 4-6) have been processed for

stable isotope geochemistry, radioisotopic ages and biostratigraphy. These results were discussed at the Calgary business meeting in July 2009 and some decisions were made (see *Permophiles* #53 for fuller explanation). In summary, we have decided to change the section and point for the base-Sakmarian to the Usolka section. The Kondurovsky section failed to reproduce the requisite conodont results, and problems about the evolution of Sweetognathus merrilli were discussed during ICOS2009. Fortunately, the Usolka section had been fully worked up as a potential parastratotype and we have excellent carbon isotope, U-Pb isotopic ages and abundant conodonts to define the boundary. It was also decided that the base-Artinskian is ready to prepare a final proposal and vote by the SPS now that conodonts have been reproduced and carbon isotopes have been added to the excellent U-Pb dates as correlation tools. At both of these sections the Sr isotopes of conodonts have also been shown to be an accurate correlation tool. Finally, it was decided that the Mechetlino section in Russia is not satisfactory for a GSSP – samples did not yield conodonts, zircons are all reworked, and the rocks are too deeply weathered to produce meaningful carbon isotopic values. Two sections in the United States, which have already been extensively studied are now being considered as potential GSSPs using the same point (FAD of *N. pnevi*); these include the Cassia Mts in southern Idaho and Rockland sections in northern Nevada. We plan to complete proposals and vote for the base-Sakmarian and base-Artinskian early in 2010. We hope to complete the final GSSP for the base-Kungurian early in 2011.

Publications: The December 2008 issue of *Permophiles* (#52) was produced online during January 2009 and distributed as a .pdf document to a mailing list of 280. The June 2009 issue (#53) was produced in July 2009 during a conodont symposium at the University of Calgary. *Permophiles* #53 has three parts including: 1) the regular issue with an edited version of the field guide on Argentine Late Paleozoic, 2) the abstract volume for ICOS2009, and 3) the fieldtrip guidebook for ICOS 2009 on the geology of the southern Canadian Rocky Mts. We have a complete series of Permophiles on our website (1978 to 2009).

Meetings: The SPS conducted two business meetings including 1) at the end of a field expedition (Feb 16 to March 2, 2009) to Patagonia, Argentina at the Museo Paleontologico Egidio Feruglio in Trelew, Argentina and 2) during the International Conodont Symposium (ICOS) at the University of Calgary on July 14, 2009. These were reported in *Permophiles* #53.

Membership: There was one addition to the membership in 2009. During the business meeting in Argentina it was decided that the SPS should have more representation from countries where the Gondwanan succession is exposed. Dr. Nestor R. Cuneo from Argentina has agreed to become a voting member. We therefore now have 17 voting members representing Argentina (1), Australia (2), Canada (1), China (3), France (1), Germany (1), Italy (1), Japan (1), Russia (3), and United States (3). We also have five honourary Members.

6. CHIEF PROBLEMS ENCOUNTERED IN 2009

There were no major problems in 2009, but decisions to reject one of our potential GSSP sites will delay the completion of the SPS's GSSP activity.

7. SUMMARY OF EXPENDITURES IN 2009:

INCOME

University of Calgary (1): $5,900.00

NIGPAS (2): $2,100.00

Donations and ICS (3): $ 2,000.00

TOTAL: $10,000.00 (quoted in US$ using 0.90 as the conversion from Canadian$. (1) University of Calgary support from NSERC grant to Charles Henderson for travel to Argentina and from the Department of Geoscience as a subsidy toward ICOS2009 to support partial costs of some participants and business meeting and dinner. (2) NIGPAS (Nanjing Institute of Geology and Palaeontology) support from NSF-C grant to Shuzhong Shen for travel support to Calgary, printing and website costs. (3) Most of this from ICS with extra support for participants of the SPS Business Meeting at ICOS2009. 1 and 2 do not include costs of sample shipment, conodont processing, and isotope analyses in order to test the GSSPs.

EXPENDITURES

Printing, Mailing, and Web support *Permophiles*: $1,100.00

Travel costs to Argentina $3,400.00

Travel costs for *Permophiles* Production: $2,100.00

Logistical costs for ICOS2009 SPS activities $3,400.00

TOTAL: $10,000.00 (quoted in US$)

BALANCE: $0.00

8. WORK PLAN, CRITICAL MILESTONES, ANTICIPATED RESULTS AND COMMUNICATIONS TO BE ACHIEVED NEXT YEAR (2010):

1. Production of *Permophiles* #54 in China during January 2010.
2. Vote on base-Artinskian in February 2010.
3. Vote on base-Sakmarian in April 2010.
4. SPS business meeting during ICS meeting in Prague May 30-June 3, 2010; the SPS executive plans to attend at this time.
5. Production of *Permophiles* #55 in Calgary during July 2010.
6. Completion of new GSSP proposal for base-Kungurian by December 2010 and vote in 2011.

9. BUDGET AND ICS COMPONENT FOR 2010

EXPENDITURES

Travel by Executive (Henderson, Davydov and Shen) to Prague ICS Mtg (1) $7,500.00

Permophiles and GSSP proposals printing and postage and web $1,250.00

TOTAL 2009 BUDGET $8,750.00

Income

Support from University of Calgary (Henderson; NSERC) $2,500.00

Support from NIGPAS (Shen; NSF-C) $2,500.00

Support from Boise State (Davydov; NSF) $500.00

Anticipated donations for *Permophiles* $ 250.00

Requested ICS contribution (1) $3,000.00

TOTAL BUDGET REQUEST (ICS) $3,000.00

Request is for $1000.00 to cover expenses for printing and postage for *Permophiles*, GSSP proposals, and some correspondence as well as website costs. In addition, SPS requests an extra $2,000.00 to partially subsidize travel costs for participants to the ICS workshop to be held in Prague during May 30-June 3, 2010 (especially for Davydov).

10. REVIEW CHIEF ACCOMPLISHMENTS OVER PAST FIVE YEARS (2005-2009)

The SPS has approved the general divisions of the Permian and has now had 6 GSSPs ratified by ICS and IUGS (Asselian, Roadian, Wordian, Capitanian, Wuchiapingian, Changhsingian).

Proposals for the latter two stages were published in Episodes in 2006. Support for documentation (fieldwork and publications) of the various chronostratigraphic methods for the establishment of the GSSPs has been the most outstanding and differentiating character of this Subcommission. Substantial work has been conducted toward producing excellent proposals for the remaining stages. *Permophiles* has become an internationally respected newsletter and bears an ISSN designation (1684-5927) and is deposited in the National Library of Canada; nine issues were published during the five year period. See Accomplishments in 2009 (above) for additional details.

11. OBJECTIVES AND WORK PLAN FOR NEXT 3 YEARS (2009-2012)

The primary objectives are to complete the GSSPs for the last three GSSPs (Sakmarian, Artinskian, and Kungurian); the first two early in 2010 and the latter early in 2011. We will continue to produce two issues of *Permophiles* each year. We anticipate the following schedule:

1. Production of *Permophiles* #54 in China during January 2010.
2. Vote on base-Artinskian in February 2010.
3. Vote on base-Sakmarian in April 2010.
4. SPS business meeting during ICS meeting in Prague May 30-June 3, 2010; the SPS executive plans to attend at this time.
5. Production of *Permophiles* #55 in Calgary during July 2010.
6. Completion of new GSSP proposal for base-Kungurian by December 2010.
7. A vote by SPS on the base-Kungurian proposal by March 2011.
8. Production of *Permophiles* #56 (Dec. 2010), #57 (June 2011), #58 (Dec. 2011), #59 (June 2012) and #60 (Dec 2012).
9. Business meeting at International Congress on Carboniferous and Permian July 2011; Perth Australia.
10. New SPS Chair to take effect at IGC in Brisbane in 2012.

Once the GSSP process is completed SPS will shift focus toward three directions beginning in 2011:

1. correlations into continental deposits,
2. correlations across provincial boundaries and within the Tethys region,
3. detailed documentation of the geologic evolution of the Earth during the Permian with respect to the established chronostratigraphic framework.

12. WEBSITE STATUS AND ACTIVITIES:

SPS website is located at http://159.226.74.3:7006/web/index.asp. This site is updated regularly and includes all back issues of *Permophiles* in downloadable PDF format (#1 in 1978 to #53 June 2009) as well as other information about SPS activities including annual reports, membership.... Shuzhong Shen at Nanjing China maintains the site and Henderson and Shen both have administrator rights.

13. FOUR YEAR SUMMARY OF ACTIVIES:

GSSPs: The proposal for the base-Lopingian (base-Wuchiapingian) was ratified by ICS and IUGS in 2004. The proposal for the base-Changhsingian was voted and ratified by SPS in 2004. The proposal for the base-Changhsingian was voted and ratified by ICS/IUGS in 2005. The base-Wuchiapingian and base-Changhsingian (Upper Permian or Lopingian Series) GSSPs were published in Episodes (volume 29, No. 3&4) in 2006. Progress was made on the three remaining Lower Permian (Cisuralian) stage GSSPs including base-Sakmarian, base-Artinskian, and base-Kungurian. An international field excursion was conducted in early July 2007 (reported in *Permophiles* #49; p. 4-6) and samples for carbon isotopes, geochronology and biostratigraphy were collected and have now been processed. The geochemical samples will provide further correlation potential for the proposed GSSPs; these materials are being analyzed at Boise State University and the Nanjing Institute of Geology and Palaeontology. The biostratigraphy samples will determine reproducibility of GSSP definitions. Decisions have been made on the basis of this new work and this is described above in section 5.

Publications: The December 2003 issue of *Permophiles* (#43) was produced at Reston, Virginia in February 2004 and distributed to a mailing list of 280 from the University of Calgary later in the year. The June/December 2004 issue of *Permophiles* (#44) was produced at Pend Oreille, Idaho during October 2004 and was distributed in December 2004 from the University of Calgary. The June 2005 issue of *Permophiles* (#45) was produced at Nanjing China during June 2005 and distributed to a mailing list of 280. The December 2005 issue of *Permophiles* (#46) was produced at the University of Calgary during November 2005 and distributed as a .pdf on our website. In addition the remaining back issues of *Permophiles* were scanned and added to our website providing a complete series of communications by Permophiles since 1978. The June 2006 issue of *Permophiles* (#47) was produced at Nanjing China during June 2006 and distributed as a .pdf document to a mailing list of 280. The December 2006 issue of *Permophiles* (#48) was produced at the University of Calgary during November 2006 and distributed as a .pdf on our website. The June 2007 issue of *Permophiles* (#49) was produced at Nanjing China during June 2007 and distributed as a .pdf document to a mailing list of 280. The December 2007 issue (#50) was produced in January 2008 after a field excursion to Australia. June 2008 issue (#51) was produced in Calgary in July 2008. December 2008 (#52) was produced online in January 2009 and #53 was produced in July 2009 in Calgary. We now have a complete series of Permophiles on our website (1978 to 2009).

Meetings: The SPS conducted its annual business meet-

ing at the IGC meeting in Florence, Italy on August 23, 2004 with 23 people in attendance. This business meeting was preceded by a session on "The Lower Permian Cisuralian Stages" co-chaired by Boris Chuvashov and Charles Henderson. This was a successful session with six oral presentations and several posters that demonstrated clear progress in the definitions for the Cisuralian stages. Abstracts for these papers appear in *Permophiles* issue #44. The SPS conducted two business meetings in 2005 including at the Triassic Chronostratigraphy and Biotic Recovery meeting in Chaohu, China on May 23, 2005 with 27 in attendance and at the Non-marine Permian Conference at Albuquerque New Mexico on Oct. 23, 2005 with 28 in attendance. This latter conference was organized by Spencer Lucas and was very successful with 68 people in attendance from 12 countries. The SPS conducted one business meeting at the 2nd International Palaeontology Congress in Beijing, China in June 2006. The SPS conducted one business meeting at the XVI International Congress on the Carboniferous and Permian in Nanjing, China in June 2007 and is reported in *Permophiles* #49. Business meetings were held in Sydney Australia (January 2008; *Permophiles* #50) and IGC in Oslo (August 2008). In 2009 business meetings were held in Trelew Argentina and at ICOS2009 in Calgary.

Membership: During 2004 the voting membership of SPS saw considerable renewal. We have a completely new executive and six new voting members. In order to allow this renewal, a few members were asked to retire their voting status. The SPS executive has decided to name a new membership category, Honourary Members, to reflect the significant past and continuing contributions of these retiring voting members. The first Honourary Members are Professors Brian Glenister, Heinz Kozur, and Claude Spinosa. Honourary Members will receive GSSP proposals and be invited to comment on the merits of the proposal, but they will not vote on the proposal. The comments of Honourary Members will be included in subsequent versions of the proposal. Only one change in voting membership occurred in 2005. Professor Giuseppe Cassinis of Italy retired as a voting member and Dr. Marc Durand of Universite de Nancy, France was voted by the executive as a replacement. Two changes were made to voting membership in 2006. Dr. John Utting retired as a voting member and was named by the SPS Executive as a Honourary Member given his long service to the SPS (past Secretary) and distinguished research record in Late Paleozoic palynology. Dr. Lucia Angiolini was nominated by the executive to fill this vacancy. This increased the membership from Europe bringing it more in line with other major regions. Secondly, we sadly lost our distinguished colleague and friend Professor Jin Yugan who died in June 2006 (see *Permophiles* #48 for a tribute). His was a very distinguished career in Late Paleozoic paleontology and service including as a past-Secretary and past- Chairman of SPS. He has been replaced as a voting member by Professor Yue Wang. There were no changes to the membership in 2007, but as noted in the 4 year summary we have made several changes over the past four years. In addition, the current executive will continue for a second term. We currently have 16 voting members representing Australia (2), Canada (1), China (3), France (1), Germany (1), Italy (1), Japan (1), Russia (3), and United States (3). We also have five honourary Members. No changes in 2008. In 2009 we added one new voting member, Dr. Nestor R. Cuneo from Argentina to add to our complement noted above.

Summary (2004-2009): In 2004 a new SPS executive was named including Charles Henderson as Chair, Vladimir Davydov as Vice-Chair, and Shuzhong Shen as Secretary. In terms of the voting membership, nine of sixteen members were new during the reporting period (56% renewal). SPS also instituted a new membership category, Honourary Member, and five individuals have been so named. SPS conducted five business meetings during the four year period at major international meetings. Two GSSP proposals for the base-Wuchiapingian (also base-Lopingian Series) and base-Changhsingian were prepared, voted, ratified and published in Episodes during the past four years. Significant progress has been made on the last three Cisuralian GSSP proposals for the base-Sakmarian, base-Artinskian, and base-Kungurian stages. An international workshop was conducted in July 2007 to determine reproducibility and accessibility as well as collect new geochemical data. During the reporting period, *Permophiles* #43 to #53 have been produced with #54 to come later this year. In addition, a website was constructed and hosted by the Nanjing Institute of Geology and Palaeontology during the reporting period. Among other items, this website has .pdf versions of all issues of *Permophiles* dating back to #1 in 1978.

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APPENDIX

Officers and Voting Members as of November 2009

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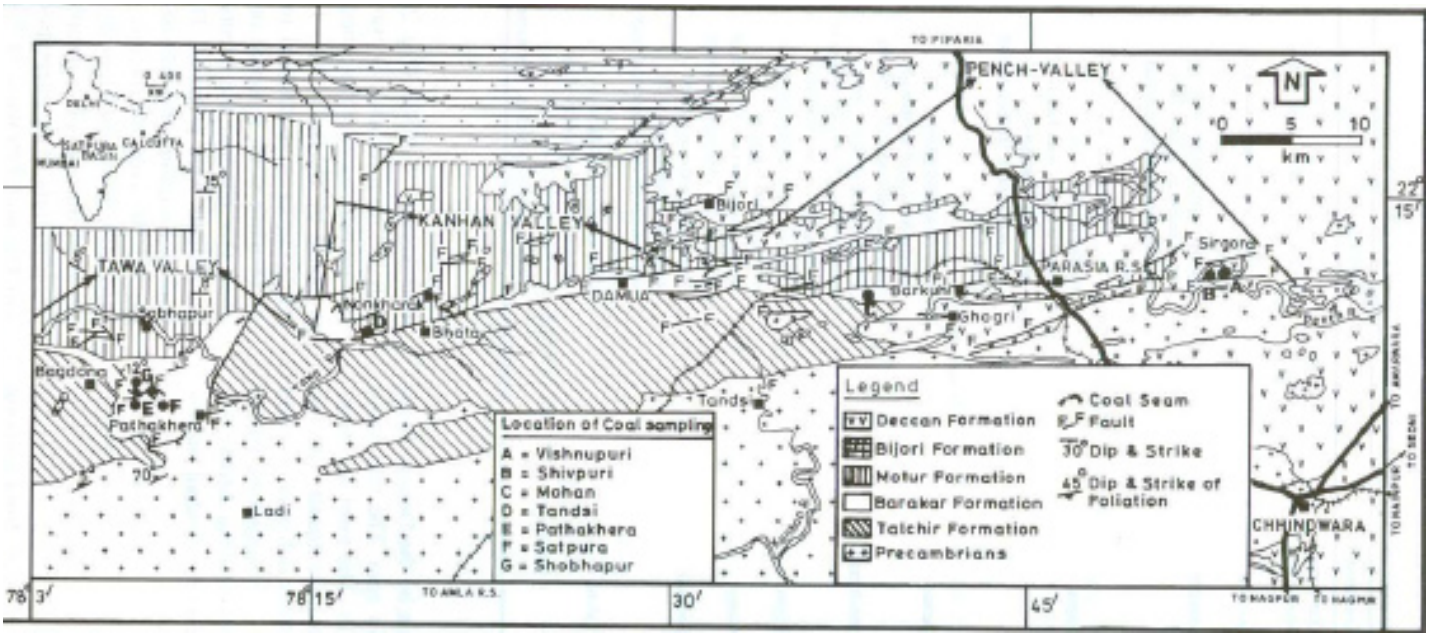

Map 1 - Geological map of Saptura Gondwana Basin

Insect Burrows from the Upper Permian sequence of Bijori Formation of Satpura Gondwana Basin, India.

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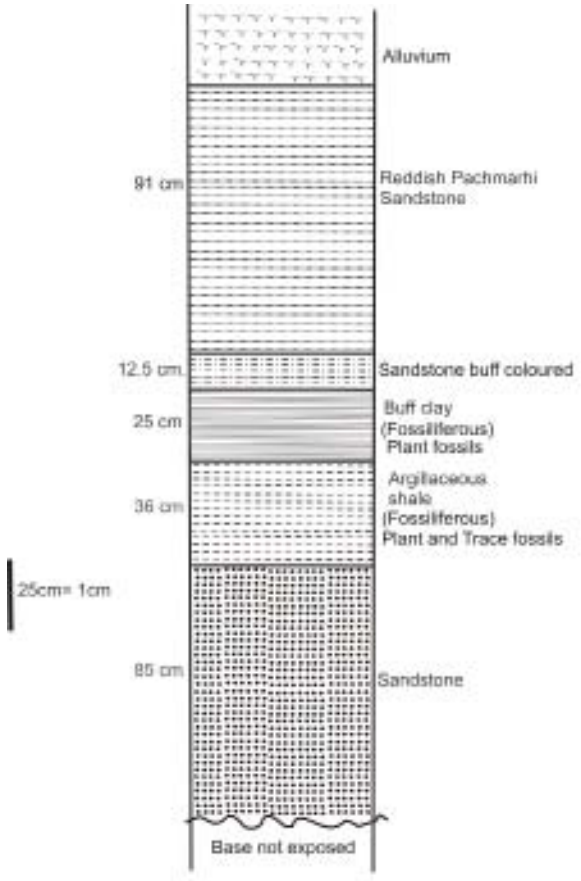
During the collection of plant fossils from different areas of Satpura Gondwana Basin (Map-1) situated in central India, we have come across well preserved insect burrows from the Upper Permian sequence of Bijori Formation, Lower Gondwana. The lithological succession and location map indicate that the Bijori succession is represented by alternating brown to yellow coloured micaceous –arenaceous sandstones and clay beds.

The road section near the village Tamia (78° 40 ‘ E: 22° 18 ‘ N) situated in Chhindwara District, Madhya Pradesh, India has yielded a well preserved plant fossil assemblage and a number of insect burrows (Map-2 and Lithological succession).

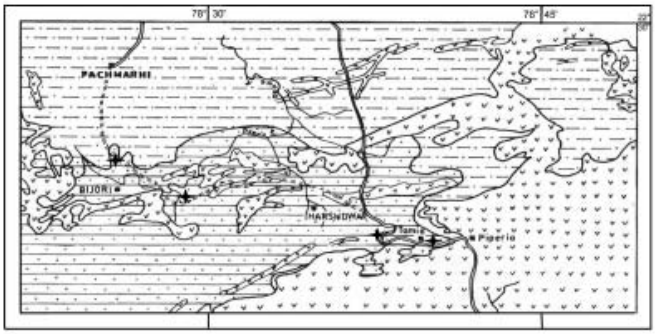
The burrows are found in association with the elements of *Glossopteris* flora viz., *Glossopteris, Neomariopteris, Santhalea, Cordaicarpus, Vertebraria* and equisetalean axes. On the basis of available plant fossils, the formation has been correlated with the Raniganj Formation of Damodar Basin (Crookshank 1936, Bharadwaj *et al* 1978).



Lithostratigraphic succession of Bijori Formation near Tamia village

Litholog

Insect burrows recorded from the Bijori Formation are very characteristic; there are tubular traces with infilling of mud par-



Right: map 2 showing sample locations

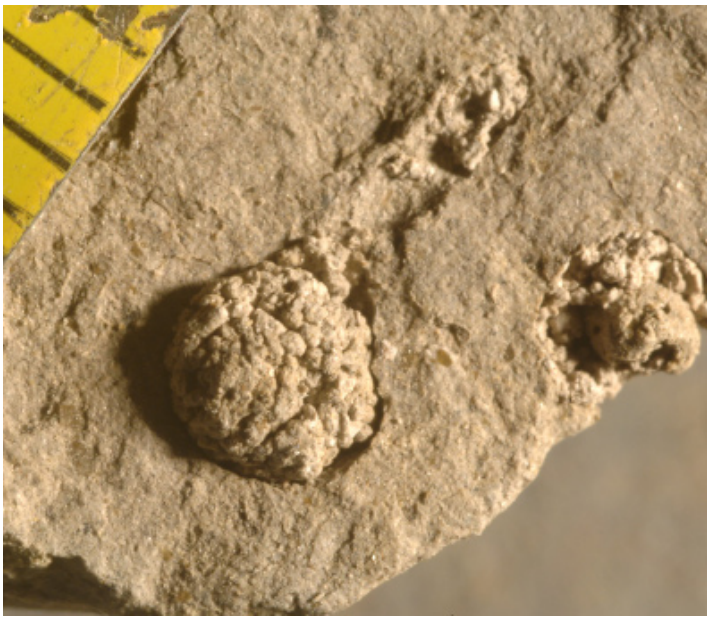


Figure 1

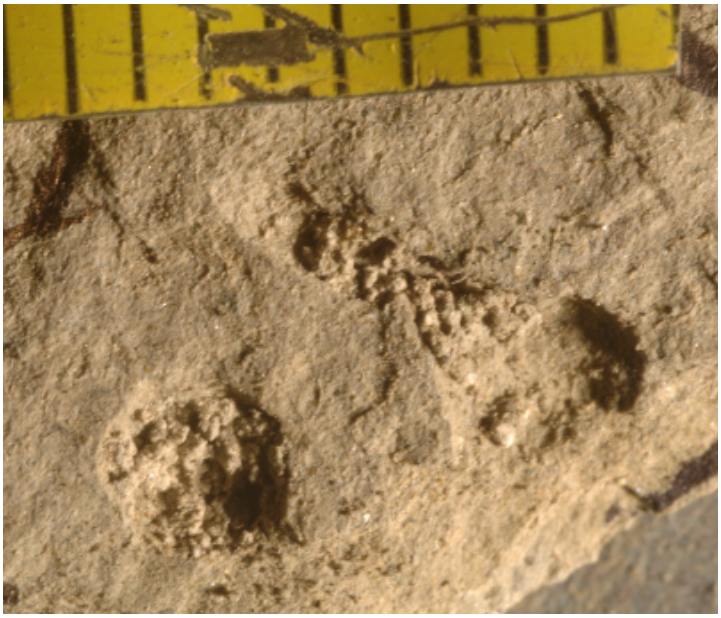


Figure 2

Figure 3

Figure 4

ticles, and exit points are markedly swollen with distinct holes. Sometimes we only see the circular depression of elevation indicating the concealment of burrows. It is interesting to note that burrow lining is always composed of mud particles.

Figures 1 and 2 represent the part and counter part where Figures 3 and 4 show circular holes and elevated structures with infilling material. Scale bar shows 1 mm division.

Different Permian sequences of India *i.e.* Talchir, Karharbari, Barakar, Barren Measures and Raniganj formations are known by many types of trace fossils (Kar and Chaudhuri, 1981; Maulik and Chaudhuri, 1983; De, 1990; Srivastava et al, 1996; Maheshwari and Bajpai, 1991; Chakraborty and Bhattacharya, 2005; Das and Rao, 1992; Das and Tripathi, 2008) but, we have never come across insect burrows collected from the Upper Permian sequence of the Bijori Formation. With present state of knowledge of insect fauna and trace fossils of insect origin, it is difficult to identify the burrows.

We would like to invite geologists and paleontologists to give their assessment, and to associate the burrows with the animal that created them. Obviously the presence of well preserved plant

fossils and absence of animal fossils rule out its association with marine forms.

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Report of the Working Group: Neotethys, Paleotethys, and South China intraplatform basin correlations

By Lucia Angiolini and Yue Wang

L. Angiolini presents a brief report on the Upper Permian brachiopods from the Nesen Formation, showing that they can be correlated not only to coeval faunas from Transcaucasia, but also with the Lopingian faunas of South China.

L. Angiolini, C. Chaouachi, V. Davydov, C.M. Henderson, A. Nicora and R. Rettori comment the results obtained from the finding of fusulinids and conodonts in the same bed in the Guadalupian succession of S Tunisia and published in *Permophiles* #51. This finding may support the correlation of lower Midian Stage of the Tethyan scale to the upper Wordian of the International scale, and it has been further investigated during new field-work in December 2009.

A. Baud presents the results of his recent research, showing for instance that the Late Permian of Transcaucasia is easily correlatable to the Lopingian of South China. He also presents the stratigraphic sections of the Middle-Upper Permian succession of South Turkey and of the Middle Permian of the Oman Mountains.

V. Davydov identifies a significant development in the genus *Dunbarula* which may be of help to solve the problematic correlation between the Tethyan Midian stage and the Wordian-Capitanian.

C. Henderson, A. Nicora and A. Baud describe the Middle Permian succession at Wadi Wasit and Maqam, Oman. Based on conodonts, the Wadi Wasit section contains most of the Guadalupian succession and will therefore serve as a good reference section to correlate other locations in Oman. These are usually difficult to correlate with the Nanpanjiang Basin of South China and the Delaware Basin of West Texas where the Middle Permian is defined, because the characteristic serrated species of *Jinogondolella* are replaced by smooth-margined species of *Mesogondolella*. However, the discovery of a few *Jinogondolella* species in Wadi Wasit may help to correlate Oman to South China and West Texas.

T. Grunt in co-authorship with V. Lozovsky and others report the study of the Ufimian Stage of the East-European Regional scale. The main attention was paid to the analysis of all available data on the Kungurian – Ufimian stratigraphic interval of the East European region: organic remains, paleobiogeography as well as the main-stratigraphic events.

H. Kozur discusses the correlation between South China and central Tethys (central and northwestern Iran, Armenian and Azerbaijan Transcaucasia). According to its discussion, the intraplatform settings of South China have a high degree of endemism especially concerning ammonoids. Conodont faunas show a lower degree of endemism, with only *C. nodosa, C. iranica, C. sosioensis* not being represented in the Changhsingian of South China. Ostracod faunas are said to be different, but this is related to the different oxygenation of South China basins with respect to Neotethys settings.

E. Leven reports an abstract of a monograph he has recently compiled and which will be soon published in Transactions of the Geological Institute Russian Academy of Sciences. The volume describes the Upper Carboniferous-Permian deposits and fusulinids of the Western Tethys from Spain and North Africa in the west to the Pamir and Karakorum in the east.

G. Muttoni briefly illustrates the paleomagnetic-based paleogeographic reconstructions of Pangea for the Early Permian, Middle Permian, and Late Permian – Early Triassic, recently published in Muttoni *et al.* (2009). This reconstruction shows Pangea undergoing transformation from an Early Permian Irvingian B to a Late Permian Wegenerian A geometry by way of the intra-Pangea dextral shear system between Gondwana and Laurasia. The active geodynamic scenario that seems to characterize the Permian may have affected the distribution and migration of both continental and marine species, in some cases enhancing and in others hampering, correlation.

S.Z. Shen and M.E. Clapham present a brief report on Wuchiapingian (Lopingian, Late Permian) brachiopods from the Episkopi Formation at Hydra, Greece.

M. Stephenson with two co-authors shows the correlation of the Middle Permian Tethyan sequences of Turkey, Iraq, Oman, Saudi Arabia and Pakistan using the standard palynological biozonation developed in Arabia. He also presents new data on the correlation between the Kuhlan Formation of Yemen and the Al Khlata Formation of Oman.

Y. Wang, K. Ueno, Y.C. Zhang and C.Q. Cao report the Changhsingian foraminiferal fauna of a Neotethyan seamount from the Gyanyima Limestone along the Yarlung-Zangbo Suture in southern Tibet, China. This fauna is dominated by *Reichelina pulchra*, *Colaniella parva* and the characteristic boultoniid genus *Dilatofusulina*. It can be roughly correlated with the *Palaeofususlina sinensis* Zone in the Paleotethys.

Y. Wang, T. Grunt, S.Z. Shen, E. Leven, X.D. Wang, V. Golubev, Q.H. Shang, A. Markov and W. Wang present a brief report on the comparative investigation and correlation of the uppermost deposits of the Upper Permian from South China and the Eastern European Region of Russia.

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Report by L. Angiolini

Brachiopods from the two members of the Nesen Formation in North Iran have been recently revised by Angiolini and Carabelli (in press). They comprise 48 species of 31 genera of the orders Productida, Orthotetida, Orthida, Rhynchonellida, Athyridida, Spiriferida, and Terebratulida. The two biozones of the lower member, the *Tyloplecta persica* and *Araxilevis intermedius* Biozones, are Wuchiapingian in age and can be correlated to the *Araxilevis* Biozone of Transcaucasia which in turn is correlatable with the Chinese Wuchiapingian faunas based on the occurrence of *C. dukouensis* at its base (Iranian-Chinese Research Group 1995); however, correlative brachiopod faunas are much more diverse in China. Some taxa are common to both regions, such as *Tyloplecta yangtzeensis*, *Meekella arakeljani*, *M. heterofolda*, *Enteletes retardata*, *Juxathyris bisulcata* and the genera *Cathaysia*, *Chenxianoproductus* and *Paraorthotetina*. Two distinct biozones have been identified in the upper member: the *Permophricodothyris ovata* and *Enteletes lateroplicatus* Biozones. They are Changhsingian in age and more diversified than the Changhsingian "*Comelicania*" (= *Gruntallina*) beds of Transcaucasia. This may be related to a paleoecologic control, as the North Iran sediments were deposited at shallow water depths, whereas the Transcaucasian succession records a shift to deeper water settings. The two biozones of the upper member show a significant generic similarity with the Changhsingian shallow water brachiopod faunas of South China as they share *Neochonetes (Huangichonetes)*, *Spinomarginifera*, *Haydenella*, *Anidanthus*, *Fusiproductus*, *Leptodus*, *Tschernyschewia*, *Orthothetina*, *Ombonia*, *Enteletes*, *Araxathyris*, *Orbicoelia*, *Squamularia*, *Permophrycodothyris*, besides the species *Spinomarginifera sulcata*, *Perigeyerella costellata* and *Schuchertella semiplana*.

The Nesen brachiopod fauna disappears about twenty metres below the Permo/Triassic boundary, with a single occurrence of a species of *Ombonia* in this almost barren interval. This is different to the brachiopod distribution pattern of South China, which has more diverse and abundant faunas up to the end-Permian extinction crisis and even in the survival interval. Statistical analyses to unravel the pattern of extinction of foraminifers and brachiopods at the top of the Nesen Formation showed that the extinction was sudden, occurring 30 cm below the biostratigraphically defined base of the Triassic and that brachiopod last occurrences underestimate the time of extinction, as predicted by the Signor-Lipps effect (Angiolini *et al.* in press).

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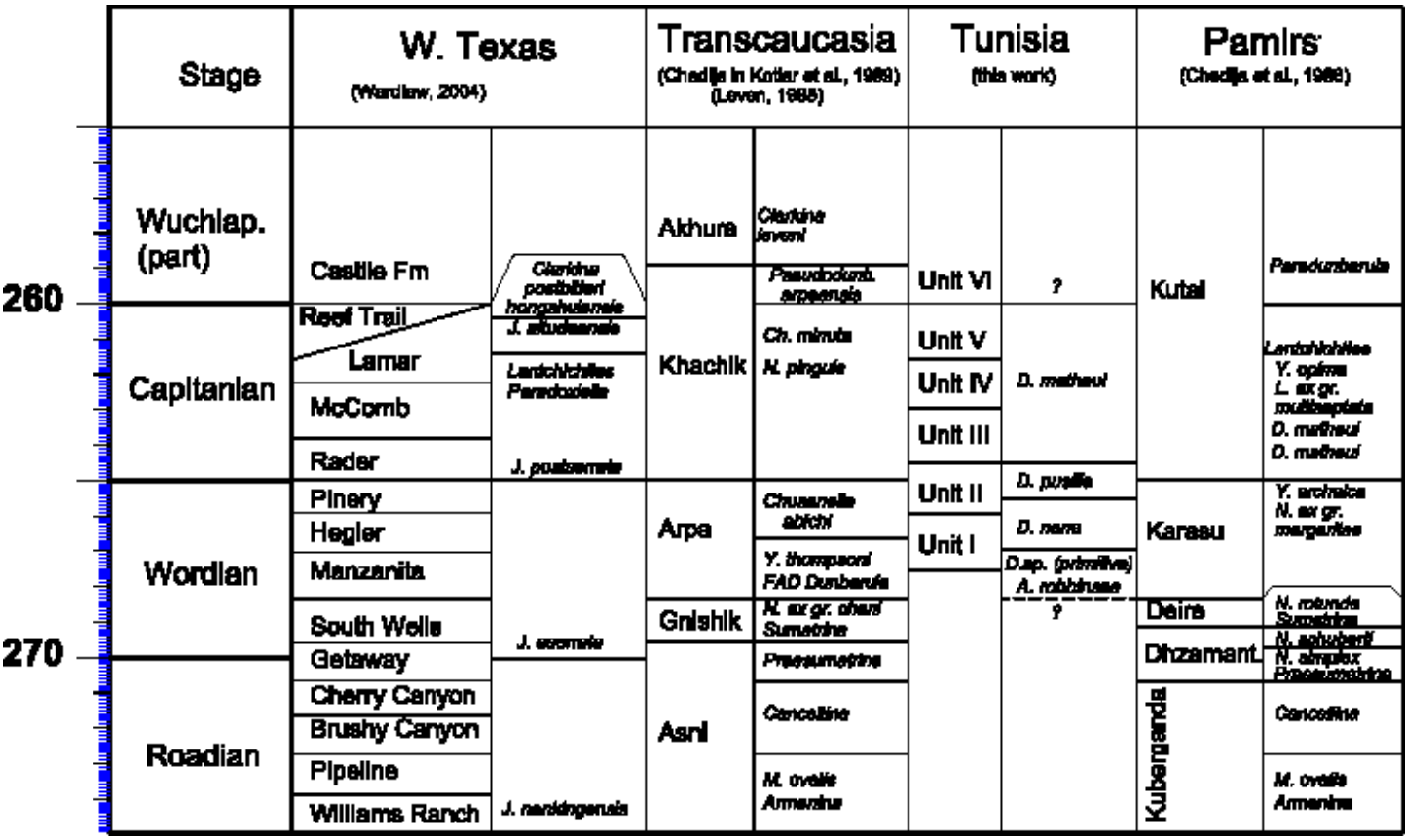

Fig. 1. Correlation of Guadalupian stages in the Neotethys/Paleotethys.


Fig. 2. Participants to the field work in South Tunisia, December 2010.

Report by L. Angiolini, C. Chaouachi, V. Davydov, C.M. Henderson, A. Nicora and R. Rettori

The Permian outcrops of Jebel Tebaga de Medenine (S Tunisia) are well known since the 1950s for their rich and well preserved fossil biota. They form a series of hills extending for about 15 km WSW-ENE, 30 km W-NW of Medenine, near the village of Dhilet Toujane. The Permian succession is an E-W monoclinal structure, 15 km long and gently dipping (30°) to the S-SE, unconformably covered with a spectacular angular unconformity by flat lying Jurassic to Cretaceous rocks. Angiolini *et al*. (2008) described the litho- and biostratigraphy of the succession along the Halq Jemel section, showing for the first time the occurrence of conodonts in the Permian of North Africa.

The finding of fusulinids and conodonts in the same bed in the Halq Jemel section is of great interest as it provides a tool of correlation between the International (Global) and the Tethyan regional scale that remains unresolved, particularly for the Guadalupian part (Fig. 1).

In the Halq Jemel section *Chusenella rabatei* Skinner and Wilde, 1967 and *Dunbarula* ex gr. *nana* Kochansky-Devidé and Ramovs, 1955 co-occur with *Sweetognathus iranicus hanzhongensis* (Wang, 1978). The latter is a quite long ranging conodont species spanning the Roadian to middle Capitanian (Guadalupian), whereas the FAD of fusulinid *Dunbarula* ex gr. *nana* is early Midian. This finding may support the correlation of lower Midian Stage of Tethyan scale to the upper Wordian of Global scale of the Permian. Nine metres above this assemblage the advanced *Dunbarula mathieui* Ciry, 1948 has been found. *Dunbarula* genus shows significant development from late Wordian through Wuchiapingian and the species *D. mathieui* elsewhere co-occurs with *Yabeina* and *Lepidolina* of Capitanian age. *D. mathieui* indicate a probable Capitanian age of the succession at Halq Jemel, except for its base which is Wordian.

New field work in Tunisia was done in December 2009 by **L. Angiolini, M. Bougdar, C. Chaouachi, G. Crippa, C.M. Henderson and A. Nicora** in order to better constrain the Guadalupian correlation between the International (Global) and the Tethyan regional scale. Several samples for conodonts and fusulinids were collected at the base of unit 1 and 2 along the Djebel Tebaga sensu strictu section; in unit 3 at Merbah el Oussif; in unit 4 at Djebel Tebaga south and in unit 5 at Halq Jemel (Fig. 2). They will be processed in the next months.

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Report by A. Baud

During 2008, A. Baud studied the collections of Kummel and Teichert deposited at the Geological Museum in Lausanne and published the results "Correlation of the Upper Permian localities in the Kuh-e-Ali Bashi area, Julfa, NW Iran: old collections, old and new data" in *Permophiles* #52. In this paper, Baud was able

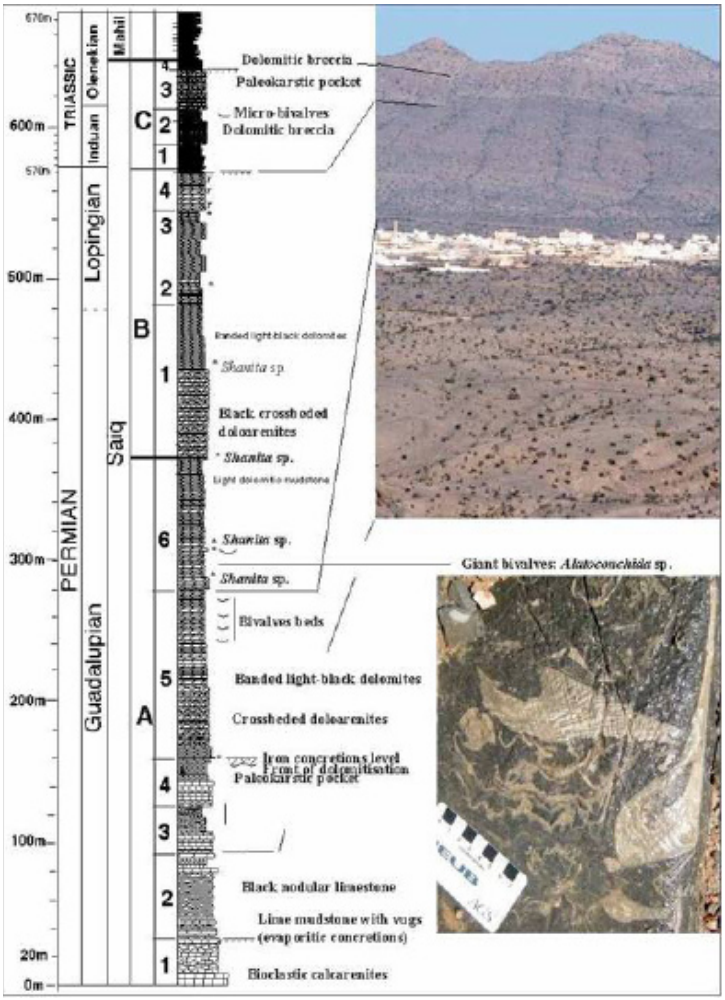

Fig. 3. Composite section of the Middle Permian to basal Triassic limestone and dolostone succession on the Saiq Plateau, one of the best exposures of the autochthonous cropping out in the Oman Mountains. Photo of the outcrops show the Saiq village; the large shells shown below belong to the giant bivalves *Alatoconchida* sp. (from Beauchamp and Baud, unpublished)

to confirm the incomprehensible mistake of Teichert *et al*. (1973), and the wrong conodont determination of H. Kozur; he showed that Sweet and Mei in 1999 correctly correlated the Lopingian of the Tethyan Julfa with the Lopingian of South China.

In January 2009, A. Baud worked with Benoit Beauchamp on Permian sections in Oman, from shallow to deep water. Part of their work will be presented during the IGCP 572 field workshop in Oman, Feb. 20-26, 2010. A new middle Permian to basal Triassic stratigraphic section from Saiq Plateau is given in Fig. 3.

In September 2009, A. Baud co-lead the first IGCP 572 field workshop in South Turkey (described later in this issue).

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Report by V. Davydov

V. Davydov proposes the following evolution within the *Dunbarula-Paradunbarula* lineage (Fig. 4). Primitive *Dunbarula* (Dunbarula sp. then *Dunbarula nana* Kochansky-Devide and Ramovs, 1955) appear sometime in early Wordian. Their evolution speeds up at the Wordian-Capitanian transition upwards and by late Capitanian *Dunbarula* become quite advanced (*D. mathieui* Ciry, 1948). The ontogenesis of advanced *Dunbarula* and *Paradunbarula* suggests their most probable relation. However, the link between *Dunbarula* and *Paradunbarula* has not been observed in the sections yet. It might be that *Paradunbarula* appears at the Wuchiapingian-Changhsingian transition or sometime later.

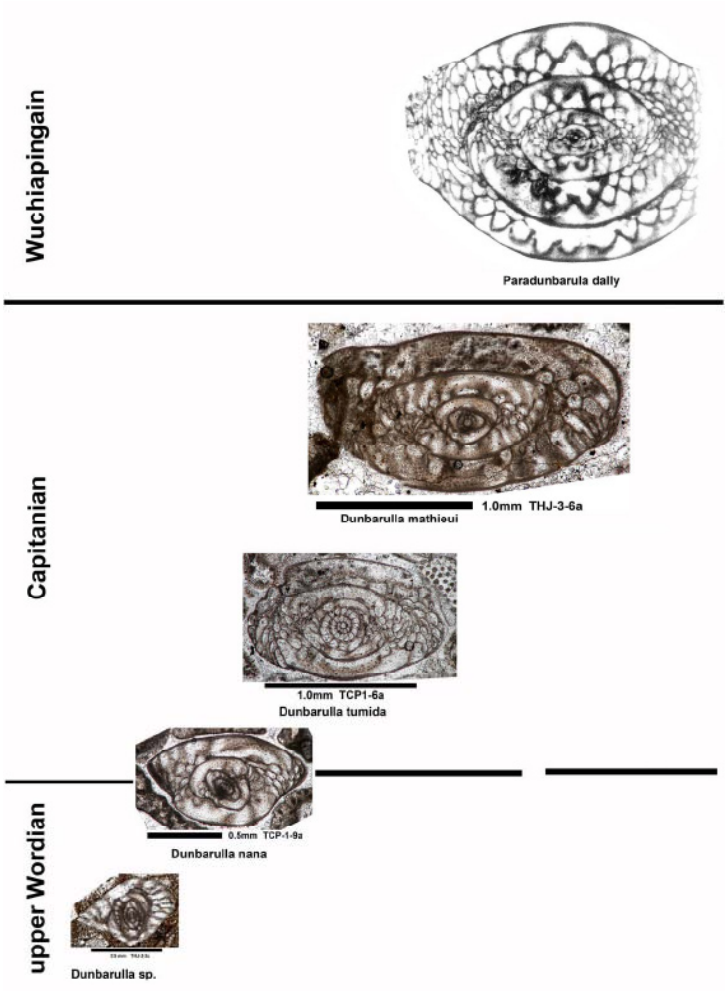

Fig. 4. Evolution within the *Dunbarula-Paradunbarula* lineage.

Report by T. Grunt and V. Lozovsky

T. Grunt in co-authorship with V. Lozovsky and others (Lozovsky *et al.*, 2009) made a study of the Ufimian Stage of the East-European Regional scale. The main attention was paid to the analysis of all available data on the Kungurian – Ufimian stratigraphic interval of the East European region. The organic remains, paleobiogeography as well as the main-stratigraphic events were studied. The original regional Kungurian Stage consisted of the Filippovian and Irenian Horizons. Meanwhile the proposed global Kungurian includes five horizons: Saranian (traditionally attributed to the Artinskian Stage), Filippovian, Irenian together consisting the Kungurian Stage in its initial and traditional understanding (Stuckenberg, 1890), Solikamskian and Sheshmian (together constituting the Ufimian Stage in its initial and traditional understanding). The results of the examination allowed us to judge that the paleontological characteristics of the Ufimian Stage differ significantly from that of the Kungurian in its initial content. The referral of the Solikamskian Horizon to the revised Kungurian is not supported by the evidence of temperate-water foraminifers, brachiopods, ammonoids, bivalves, fish remains, charophytes and macrofloral remains. In contrast, the Solikamskian Horizon yields numerous taxa unknown from the Early Permian, but widespread in the overlapping Kazanian Stage (Biarmian Series). The Ufimian Stage is characterized by the index ammonoid genus *Epijuresanites* – a primary form in the phylogenetic lineage of the genera *Epijuresanites – Sverdrupites* belonging to the Family Spirolegoceratidae; these two genera correspond to the evolutionary stages of the lineage, which are reflected in the phylogenetic succession: *E. primarius – E. musalitini – E. vaigachensis – Epijuresanites* sp., *E. primarius* Popov, being the oldest and most primitive species of the genus coming from the Solikamskian Horizon of northern part of European Russia (northeastern Pai-Khoi). *E. primarius* replaces Kungurian *Tumaroceras dignum*. The Kazanian (=Roadian) Stage in the development of ammonoids is determined by the phylogenetic lineage of the genus *Sverdrupites: S. harkeri – S. amundseni – S.* aff. *amundseni* (Leven and Bogoslovskaja, 2006; Fig. 15). The variant of the East European scale retains its traditional two-fold structure with two subsystems each subdivided in two series with their own names. The two main units of the Tethyan scale are also considered in the subsystem ranking, with each separated in two series with their own names (Leven, 2009).

The base of the Solikamsk Horizon of the Ufimian in the Tethyan scale corresponds most likely to the base of the Kubergandian Stage. If the Ufimian Stage is eliminated, the lower boundary of the Kubergandian Stage (and Upper Tethyan Subsystem) falls inside the Kungurian Stage being unrecognizable both in the East European and International stratigraphic scales (Leven and Bogoslovskaja, 2006).

The study is supported by RFFI (All-Russian Foundation for Basic Research, No 09-05-01009) for T. Grunt.

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Report by C.M. Henderson, A. Nicora and A. Baud

Exposed in the Oman Mountains about 50 km south of Muscat, the Wadi Wasit section comprises a relatively deep water succession with four distinct levels of basaltic pillow lavas interbedded with a variety of sedimentary facies including chert, volcanic breccia, red and white limestones, and reworked Middle Permian reef limestone. A red, platy, ammonoid-rich (Hallstatt facies) limestone caps the upper pillow lava level. These sediments of the Al Jil Formation were deposited on the south margin of the Neotethys, well inboard from the connection to the open Panthallassic Ocean. They are now part of a complex tectonostratigraphic assemblage that belongs to the lower Hawasina Nappes. Conodonts from three closely spaced samples are also reported from the Maqam Formation of Wadi Maqam near the border between Oman and the United Arab Emirates.

The conodont faunas within these rocks differ in character from those of the Nanpanjiang Basin of South China and the Delaware Basin of West Texas where the Middle Permian is defined. As a result, correlations between these regions have been problematic. The biggest problem is that the characteristic serrated species of *Jinogondolella* are seemingly replaced by smooth-margined species of *Mesogondolella*. Henderson and Mei (2003) discussed possible environmental constraints that might account for their absence as well as some of the problems of correlation. However, recent studies have revealed that specimens of *Jinogondolella* do occur sporadically in the region and in other cases subtle serration can be seen on rare specimens within populations of *Mesogondolella*. The exact causes of this pattern are not understood, but some aspect of ocean-chemistry or other environmental factors may affect the distribution and migration of serrated species and possibly lead to excess precipitation of phosphate, masking serration in other populations. Resolution of generic assignments will require an assessment of the full apparatus, but most samples obtained to date are typical platform over-represented assemblages.

Conodonts near the base of the Wadi Wasit succession include a new species of *Mesogondolella* that have a characteristic strongly arched platform that is similar to forms in South China from the base of the Guadalupian in the early Roadian. At 80 metres, symmetrical forms with subtle serration and asymmetrical forms with serration are comparable to *Jinogondolella nankingensis* and *J. aserrata* respectively, suggesting a correlation with a level near the Roadian-Wordian boundary. At 230 metres there is a large population of mostly smooth, well-preserved forms of *Mesogondolella* that probably represent a new species; as well as rare serrated forms that may point to a late Wordian or early Capitanian age. This species is accompanied at the Maqam location by *Iranognathus*? n.sp. *A* reported by Mei *et al.* (2002) from one location in the late Capitanian Laibin Limestone at Penglaitan, Guangxi, South China and *Sweetognathus* aff. *iranicus hanzhongensis* (advanced form?) reported by Mei *et al.* (2002) from the Guadalupian of South China and *Hindeodus wordensis* (mid-Roadian to early Capitanian in West Texas; see Nicora *et al.*, 2009). Although the ranges of these taxa are not well constrained they point to a Capitanian age and a shallower water environment compared to Wadi Wasit. Our uppermost sample at the Wadi Wasit section at 237.3 metres has poorly preserved specimens, possibly because of recrystallization during dolomitization. However, these forms are quite different from below and can be compared with *Jinogondolella altudaensis* indicating a mid to late Capitanian age. Although these species are still poorly defined and difficult to correlate, there is a strong possibility that the Wadi Wasit section contains most of the Guadalupian succession and will therefore serve as a good reference section to correlate other locations like Rustaq.

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Report by H. Kozur

H. Kozur discusses the correlation between South China and central Tethys addressing six main topics:

1) Changhsingian sediments of South China were deposited in an intraplatform setting. As typical for the Upper Permian and the Triassic, such an intraplatform setting has a different degree of endemism in different fossil groups compared with open sea faunas, which have a very wide distribution, but may be absent in an intraplatform setting.

2) The Changhsingian ammonoid faunas of South China are nearly 100 % endemic. Nearly all guide forms of the open sea are absent in the South China intraplatform setting. Only in the uppermost Changhsingian, *Pleuronodoceras* - but with different species - is present both in the open sea setting and in the endemic intraplatform faunas of South China. In the same level also *Hypophiceras,* occurs with a worldwide distribution in ammonoid-bearing rocks. All other Changhsingian ammonoid species and genera of the open sea that have a very wide distribution (central Tethys of central and northwestern Iran, Armenian

and Azerbaijan Transcaucasia for all genera and species, additionally Southern Alps and Madagascar for *Paratirolites*) are totally absent among the endemic intraplatform Changhsingian ammonoid faunas of South China. On the other hand, nearly all Changhsingian ammonoids of South China intraplatform basins, except few long-ranging forms, are endemic to the intraplatform basins of South China and absent in the open sea ammonoid fauna.

3) Fortunately, the endemism of the Changhsingian conodont faunas in the South China intraplatform basins is much less than that of the ammonoids. Recently, the open sea *Clarkina bachmanni* Kozur, and *Merrillina ultima* Kozur have also been found in South China. The evidence of the *C. bachmanni* Zone in South China is especially important because the drop in the carbon isotope curve begins in this zone. The evidence of *Merillina ultima* in the uppermost Changhsingian of South China, just below the basal Triassic *H. parvus* Zone has not only brought the evidence for the *M. ultima* Zone in the South Chinese intraplatform basins, but this form is also interesting because *Merrillina ultima* is a cool water form that invaded even the equatorial faunas of South China. It is not as common there, as in central and northwestern Iran, but present.

4) Only two Changhsingian conodont zones are obviously missing in South China intraplatform basins. This is not caused by gaps, but by a slight endemism also in the conodont faunas of the South Chinese intraplatform setting. The *Clarkina nodosa* Zone of the open sea Changhsingian conodont fauna is absent in the South Chinese intraplatform basins. The strongly sculptured *C. nodosa* is difficult to overlook and therefore obviously not present in South China. At Meishan, also the *C. iranica-C. sosioensis* fauna is absent. This upper Changhsingian open sea fauna is very common in the central Tethys (Iran, Transcaucasia), but also in the westernmost Tethys of western Sicily (Italy), where conodonts of the *C. iranica* group are absolutely dominating forms, but not represented by a single specimen at Meishan.

5) The brachiopods of the Changhsingian of South China are also different from the open sea brachiopod fauna of the Tethys, but the facies was not yet compared in detail and therefore the reason for these differences are not yet clear.

6) The Changhsingian ostracod fauna of the South Chinese intraplatform basins is very different from the open sea ostracod faunas of the Tethys, especially of the Neotethys. This, however, must not indicate endemism, because the Neotethyan ostracods are from red sediments with high oxygen bottom water, whereas the oxygen content of the bottom water in the intraplatform Changhsingian of South China was surely lower, but similar to that of the Paleotethys, where the differences to South China are less pronounced.

Report by E.Ya. Leven

E. Leven has recently compiled the monograph "The Upper Carboniferous (Pennsylvanian) and Permian of the Western Tethys: fusulinids, stratigraphy, biogeography" which should be published by the end of year on the Transactions of the Geological Institute Russian Academy of Sciences, v. 590, Publishing House "GEOS", Moscow (in Russian). It comprises approximately 200 pages and 36 plates with Bashkirian to Dorashamian fusulinids. The volume summarizes the Upper Carboniferous-Permian deposits and fusulinids of the Western Tethys. Within each single stratigraphic framework the data are presented from the vast territory from Spain and North Africa in the west to the Pamir and Karakorum in the east. Typical fusulinid assemblages characteristic of each of the Late Carboniferous and Permian stages and substages are described. The most complete sections are correlated and paleogeographic reconstructions of fusulinid distribution are shown for different time intervals. Problems of paleogeography and tectonics of the Western Tethys are also discussed. Brief descriptions of 450 characteristic fusulinid species reproduced in 36 plates are presented. The volume is thus of great importance for the ongoing discussion on Permian correlation.

E. Leven is also currently studying the Permian succession and fusulinids from Kalmard area, Iran that are very similar to those of Central Pamir, providing new insights on paleobiogeography and correlation.

Report by G. Muttoni

Paleomagnetic-based paleogeographic reconstructions of Pangea for the Early Permian (ca. 296–272 Ma; Fig. 5), Middle Permian (ca. 272–260 Ma; Fig. 6), and Late Permian – Early Triassic (ca. 260–249 Ma; Fig. 7) have been recently proposed (Muttoni *et al.*, 2009 and references therein) and are here briefly illustrated.

Early Permian paleomagnetic data support a Pangea B configuration. Within Pangea B, the separation from Gondwana of the Cimmerian terranes, previously attached to the Arabia-Australia margin from Iran to Sibumasu via western Karakoram and Qiangtang, initiated with Neo-Tethyan spreading approximately during the middle part of the Early Permian, or ca. 290–284 Ma (Fig. 5). At approximately the same time, a major zone of northward subduction of Paleotethyan oceanic lithosphere was activated along the southern Eurasian margin and persisted during most of the Permian – Triassic. To the west along the former Variscan Suture of Europe, a zone of diffused dextral shear lubricated by abundant magmatism started to develop between Gondwana and Laurasia. Three major plates, *i.e.* Gondwana, Laurasia, and Paleotethys (including the Cimmerian terranes) seemed to have existed in the Early Permian. These plates were joined at a ridge-trench-transform fault (RTF) triple junction presumably located somewhere to the northeast of Adria (star in Fig. 5).

The Middle Permian paleogeographic reconstruction shows Pangea undergoing transformation from an Irvingian B to a Wegenerian A geometry by way of the intra-Pangea dextral shear system between Gondwana and Laurasia (Fig. 6). The northward drift of the Cimmerian terranes was well on its way. The Neotethys Ocean seems to have opened asymmetrically with higher seafloor spreading rates for the central Cimmerian terranes than for western terranes such as Iran (Fig. 6). New oceanic lithosphere emplaced at the Neotethyan ridge was in part accommodated by the synchronous subduction of old Paleotethys oceanic litho-

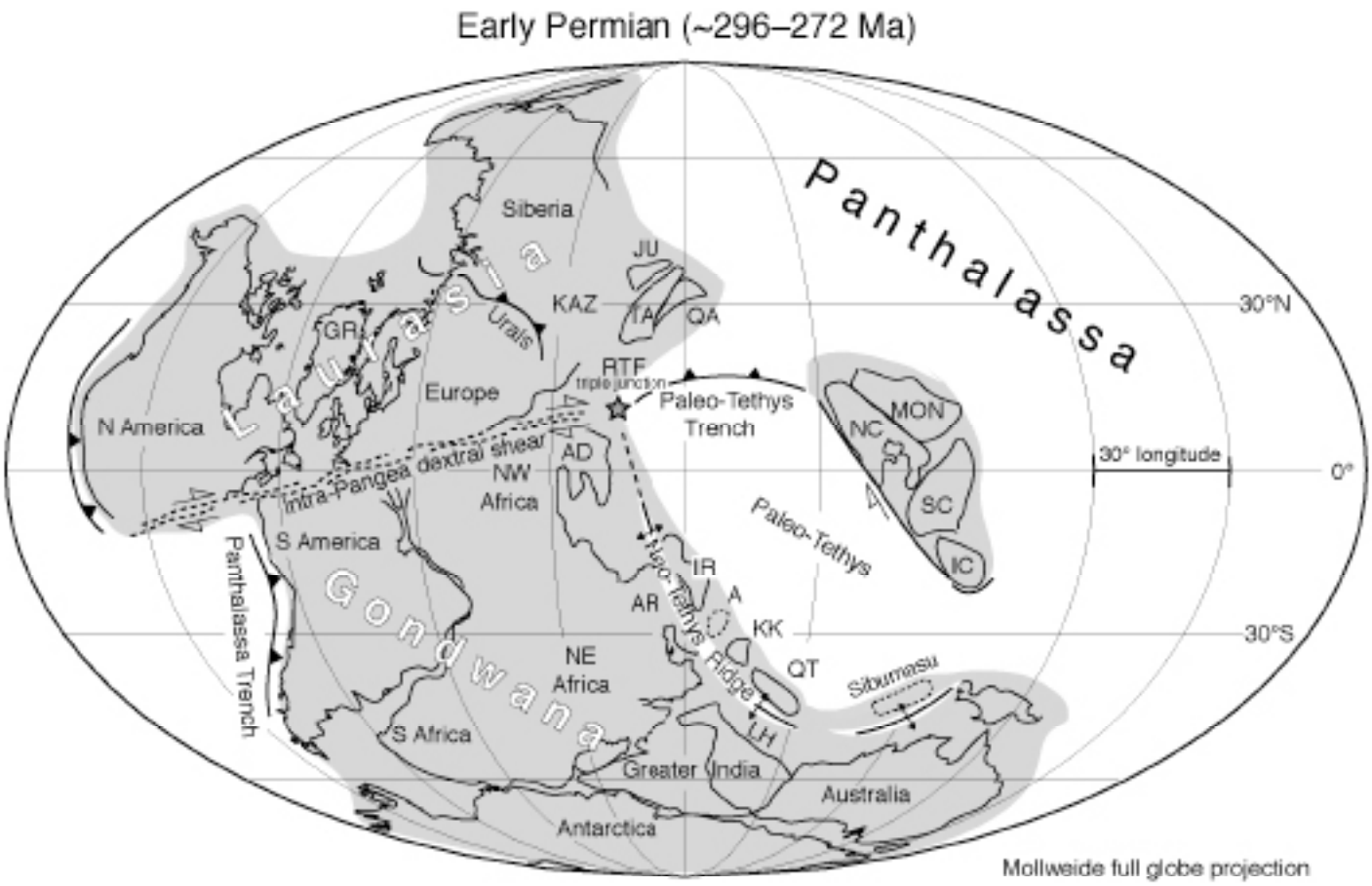

Fig. 5. Paleogeographic reconstruction of Pangea B for the Early Permian. The star to the northeast of AD–Adria indicates the hypothetical location of a ridge-trench-fault (RTF) triple junction adjoining the Gondwana, Laurasia, and Paleo-Tethys plates. Plate boundaries are, from west to the east, the Panthalassa trench, the intra-Pangea dextral shear system, the Neo-Tethys ridge, and the Paleo-Tethys trench. Trenches are indicated by solid triangles, ridges by small diverging arrows, while half arrows indicate transcurrent plate motion. A–central Afghanistan, AD–Adria, AR–Arabia, IC–Indochina, IR– northern and central Iran, JU–Junggar, KAZ–Kazhakstan, KK–Karakoram, LH–Lhasa, MON–Mongolia, NC–north China, QA–Qaidam, QT–Qiangtang (north Tibet), SC–south China, SIB–Siberia, Sibumasu–Myanmar-Thailand-Baoshan-Malaysia, TA–Tarim. Terranes of uncertain position are represented by dashed lines (*i.e.*, A–central Afghanistan, LH–Lhasa, Sibumasu).

sphere at the Paleotethyan trench, which was active during most of the Permian – Triassic. The remainder of the Neotethyan oceanic lithosphere was accommodated by the dextral transcurrent motion of Laurasia relative to Gondwana along the intra-Pangea shear system. The motion of Laurasia relative to Gondwana was in turn accommodated by the subduction of Panthalassan oceanic lithosphere along the west side of the Americas (Fig. 6). The RTF triple junction where the Gondwana, Laurasia, and Paleotethys plates joined (star in Fig. 6) remained presumably stable over the Middle Permian because the intra-Pangea dextral shear system and the Panthalassan trench were broadly aligned along the same great circle transect.

Paleomagnetic data indicate that the transformation from Pangea B to Pangea A-type was virtually completed by the Late Permian – Early Triassic (Fig. 7). At that time, the Cimmerian terranes of northern Iran, Central Iran, Qiangtang, and possibly also the intervening Afghanistan and Karakoram terranes, attained subequatorial paleolatitudes (Fig. 7). In the east, the Sibumasu Terrane, after late Sakmarian (mid Early Permian) separation from Gondwana, approached the China blocks in the Late Permian.

In terms of continental drift and plate tectonics (Figs 5-7), three major plates – Gondwana, Laurasia, and Paleotethys – seemed to have moved in spatio-temporal contiguity, altogether constituting an internally consistent scenario of Neotethys Ocean opening, Cimmerian terranes northward drift, and Pangea B to Pangea A transformation over the course of the Permian. Relative plate speeds within this evolving Permian tectonic circuit are difficult to evaluate precisely. The dextral displacement of 3,000 km between Laurasia and Gondwana should have occurred at a relative speed of c. 10 cm/yr or higher, whereas the northward motion of the Cimmerian terranes on the order of c. 7–10 cm/yr for Iran and c. 12–17 cm/yr for Karakoram and Qiangtang. For additional information, see Muttoni *et al.* (2009 and references therein).

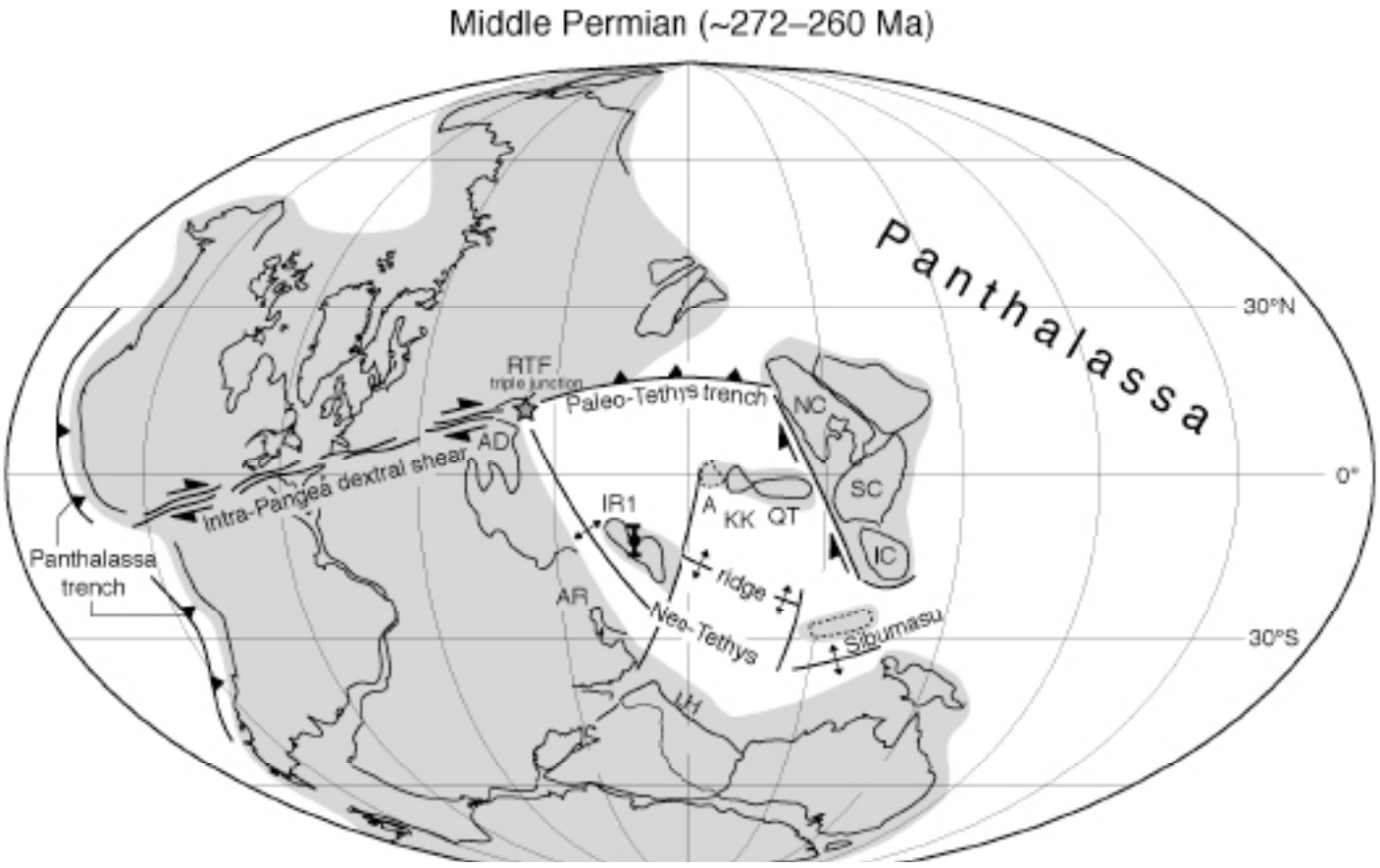

Fig. 6. Paleogeographic reconstruction of Pangea undergoing transformation from Pangea B to Pangea A during the Early Permian. Symbols and acronyms as in Figure 5.

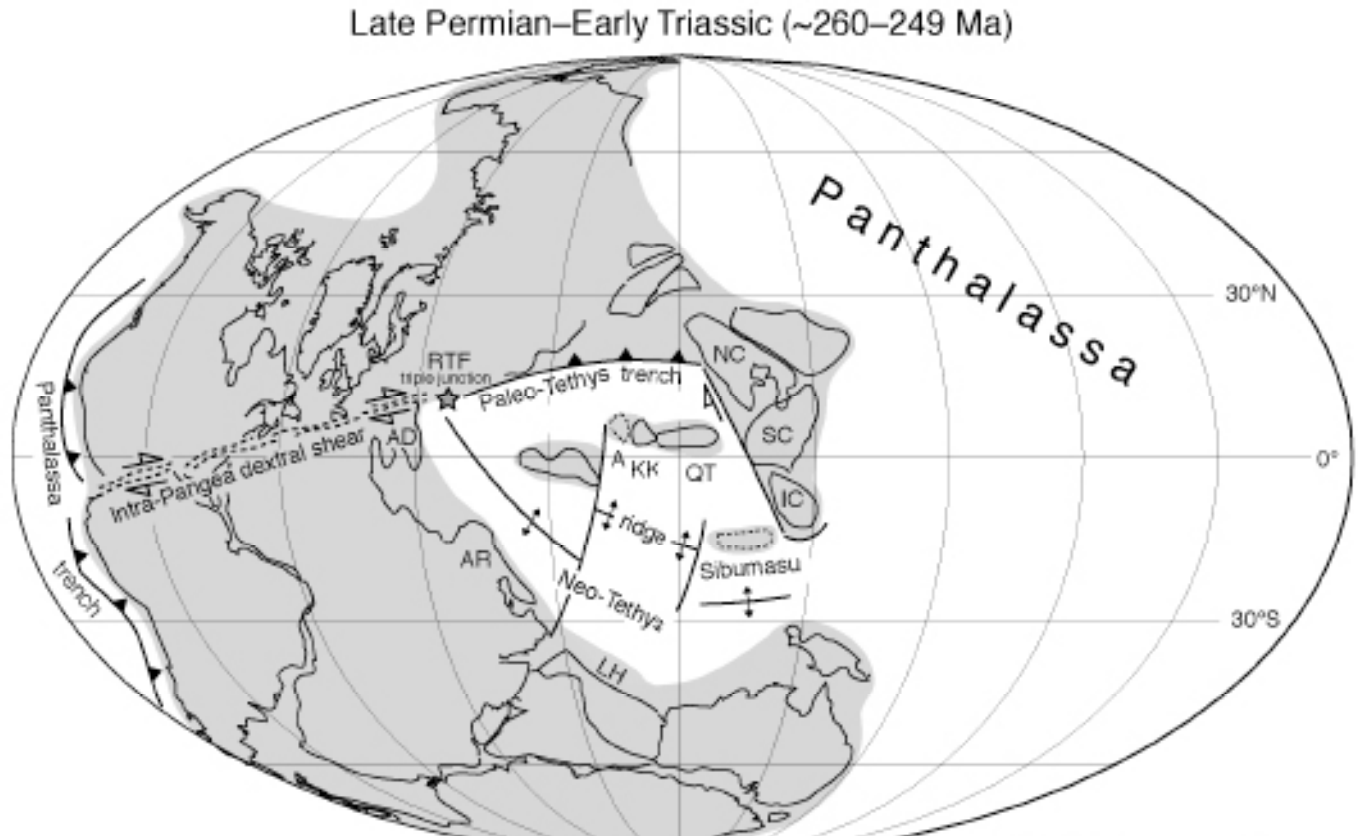

Fig. 7. Paleogeographic reconstruction of Pangea A for the Late Permian – Early Triassic. Symbols and acronyms as in Figure 5.

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Fig. 8. ?*Florinites balmei* from the Sardhai Formation.

Report by Shuzhong Shen and Matthew E. Clapham

S.Z, Shen and M.E. Clapham recently studied the Wuchiapingian (Lopingian, Late Permian) brachiopods from the Episkopi Formation at Hydra, Greece. Twenty-three species of silicified brachiopods are described from four samples in the middle and upper parts of the Episkopi Formation from Hydra Island, Greece. These brachiopods are newly recorded from the region and, together with previously described brachiopods from the same localities, constitute the most highly diverse Lopingian (Late Permian) brachiopod fauna ever reported in southern Europe. The brachiopod fauna from the four samples in the Episkopi Formation is Wuchiapingian in age in terms of the associated conodonts. The fauna from Hydra exhibits strong paleobiogeographic links with the faunas from South China. In addition, paleobiogeographic affinities with the faunas of Thailand and the northern peri-Gondwanan region are also present, which implies the peri-Gondwanan origin of Hydra. Paleoecologically, the brachiopod assemblage from sample EP in the middle part of the Episkopi Formation is dominated by pedically-attached and cementing genera and reflects moderate energy conditions above storm wave base and an abundance of hard substrates provided by sponges in the biohermal habitat. By contrast, the brachiopod assemblage in the other three samples from the upper part of the Episkopi Formation is dominated by spinose genera with a free-resting life habit, suggesting soft substrates in a quiet water environment below storm wave base on the outer part of the shelf. New taxa are *Petinospiriferina* gen. nov., *Hustedia episkopiensis* sp. nov., *Waterhouseiella hydraensis* sp. nov. and *Xenosaria tenuis* sp. nov.

Report by M.H. Stephenson, Irfan U. Jan and Sa'ad Zeki Al-Mashaikie

In the last year, correlation of the southern Tethyan Permian has improved due to the use of high resolution biozonation developed in Oman, and a general standard biozonation developed for the Arabian peninsular as a whole. Stephenson *et al.* (2003) and Stephenson (2006, 2008) proposed a biozonation that united information from Oman, Saudi Arabia, Qatar and United Arab Emirates. This scheme consists of a framework of eight biozones for the uppermost Carboniferous to Middle Permian strata, OSPZ1, 2, 3a,b,c; 4, 5 and 6. Originally the exact stratigraphic relationships between OSPZ5 and OSPZ6 were not clear, but work in 2006 on the densely sampled Upper and Middle Gharif members in the Petroleum Development Oman Barik-36 well demonstrated the transition from OSPZ5 to OSPZ6 assemblages (Stephenson, 2006). The respective bases of biozones OSPZ5 and OSPZ6 were defined by Stephenson (2006), and the stratigraphic ranges of the other important palynomorphs in OSPZ5 and OSPZ6 given by Stephenson (2008). Within Oman, biozonation has also been improved with the publication of a detailed scheme for the central subsurface Oman Carboniferous-Permian, which documents almost 50 years of in-house Petroleum Development Oman research (Penney *et al.* 2008). The biozonation is fully integrated with the standard OSPZ Arabian zones.

In Pakistan it has been possible to recognize OSPZ6 because of the presence in the Salt Range Sardhai Formation of *Florinites*? *balmei* along with other taxa of the biozone (Jan *et al.* 2009) (Fig. 8).

The Sardhai Formation lies between the red-bed Warchha Formation and the Amb Formation limestones in the Salt and Khisor ranges. The presence of this pollen and the OSPZ6 Biozone, and stratigraphic context, suggest that the Sardhai Formation correlates with the Khuff transition beds of Oman and the basal Khuff clastics of central Saudi Arabia (Fig. 9). Since *Florinites*? *balmei* was first described by Stephenson and Filatoff in 2000 from the basal Khuff clastics of Saudi Arabia, it has since also been reported from Oman, Kuwait, southeastern Turkey, Iraq, United Arab Emirates and Qatar. This suggests that OSPZ6 Biozone is likely traceable across much of the southern Tethys shore. However the plant that produced *Florinites*? *balmei* also clearly had a rather limited paleogeographic distribution in Gondwana and Laurasia as a whole in the Mid-Permian. This limited distribution may be useful in reconstructing the problematic tectonic and paleogeographic history of the complex southern Tethyan region which underwent several tectonic calving episodes during the Permian.

In Yemen, the first detailed palynological analysis of the Kuhlan and Akbra formations is under way. A small number of samples from the lower part of the Kuhlan Formation near Kuhlan village (about 70 km NW of Sana'a City; Al-Mashaikie *et al.* 2005) have already yielded well preserved and diverse palynological assemblages allowing application of the scheme of Penney *et al* (2008) and the standard Arabian scheme. The quantitative character and the presence of *Deusilities tentus, Brevitrietes cornutus, B. parmatus, Dibolisporites disfacies, Verrucosisporites andersonii* and *Microbaculispora tentula* suggest close similarity with assemblages from the Al Khlata Formation of Oman, and the presence

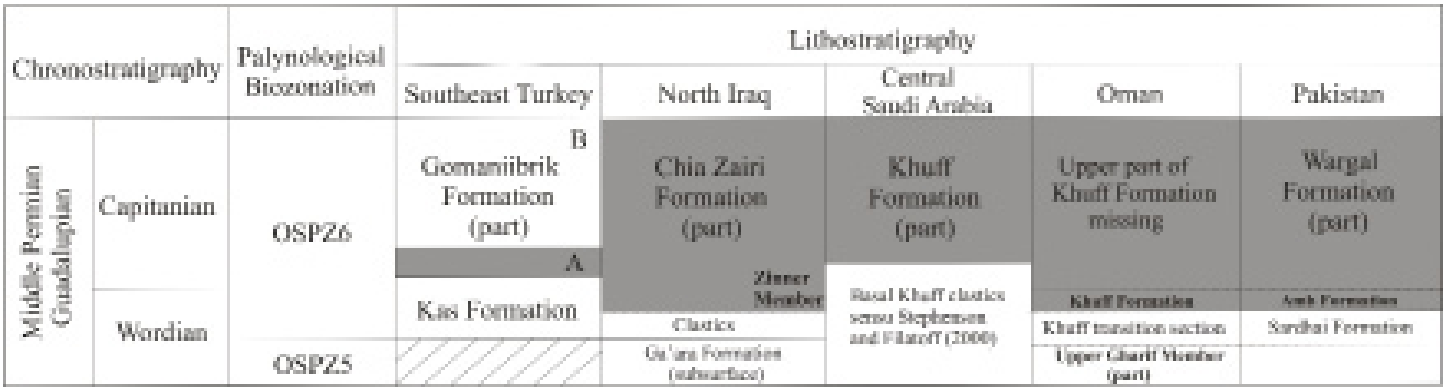

Fig. 9. Correlation of Tethyan sequences using the standard OSPZ Arabian biozonation (modified from Jan *et al.* 2009).

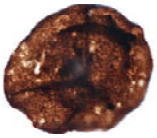

Fig. 10. *Spelaeotriletes triangulus* from the Kuhlan Formation, Yemen; approximate diameterz of specimen is 105µm.

of *Spelaeotriletes triangulus* (Fig. 10) and *Anapiculatisporites concinnus* suggests an upper 2165B to lower 2141A age (Penney *et al.* 2008), which corresponds to the general Arabian OSPZ1 Biozone of Stephenson *et al.* (2003).

This is most interesting because it indicates that the Kuhlan Formation correlates with the middle part of the Al Khlata Formation. Its likely age is late Carboniferous and not Early Jurassic as suggested by Diggens *et al.* (1988). The work in Yemen is being prepared for publication.

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Report by Y. Wang, K. Ueno, Y.C. Zhang and C.Q. Cao

The Gyanyima Limestone is one of the isolated carbonate buildups or part of a break-up seamount of Neotethyan origin distributed along the Yarlung-Zangbo Suture in southern Tibet. The reefal limestones and bioclastic limestones at the Gyanyima section yield a highly diversified foraminiferal fauna consisting of eight taxa of fusulinaceans and twenty nine taxa of non-fusulinoidean foraminifers. Non-fusulinoidean foraminifers include *Colaniella parva* (Colani), *C. minima* Wang, *C. lepida* Wang, *Paracolaniella leei* Wang, *Pachyphloia*, *Frondina*, *Frondicularia*, *Nodosaria*, *Robuloides*, *Geinitzina*, *Tetrataxis*, *Tuberitina*, *Abadehella*, *Hemigordius*, *Climacammina*, *Dagmarita*, *Paradagmarita*, *Postendothyra*, *Neoendothyra*, *Deckerella*, *Globivalvulina*, *Paraglobivalvulina*, *Agathammina*, *Neodiscus*, *Multidiscus*?, *Kamurana*, *Charliella*, *Urushtenella* and *Rectostipulina*. Fusulinaceans are rare compared to non-fusulinoidean foraminifers. They include *Reichelina changhsingensis* Sheng et Chang, *Reichelina pulchra* Erk, *Parareichelina* sp.1, *P.* sp.2, *Dilatofusulina orthogonios* (Fig. 11, Sheng et Sun), *Staffella* sp., *Nankinella* sp. and *Codonofusiella* sp. (Wang *et al.*, in press). This fauna is dominated by *Reichelina pulchra*, *Colaniella parva* and the characteristic boultoniid genus *Dilatofusulina*. It represents a general appearance of the Lopingian foraminiferal fauna in the Paleotethys except for the presence of *Dilatofusulina* and absence of *Palaeofusulina*.

The new boultoniid genus *Dilatofusulina* is established based on specimens from the upper part of the Gyanyima Limestone (Wang and Ueno, 2009). The genus is somewhat similar to *Codonofusiella* and *Parananlingella*, but it is distinct in having a rapidly expanding, but fully coiled last half volution. It probably represents an advanced offshoot of the *Nanlingella-Parananlingella* lineage in the family Boultoniidae. Based on its phylogenetic position and co-occurrence with *Colaniella parva*, this genus is referable to the late Changhsingian Stage (equivalent to the *Palaeofusulina sinensis* Zone in South China). To date, it is known from Gyanyima in southern Tibet, from Tianjun and Maduo Counties in Qinghai Province, China, and from Lamayuru in Himalayan Ladakh, India. These occurrences indicate a paleogeographic distribution limited to the northern and southern margins of the Tethys Sea.

Just like the foraminifers, ostracods and corals from the

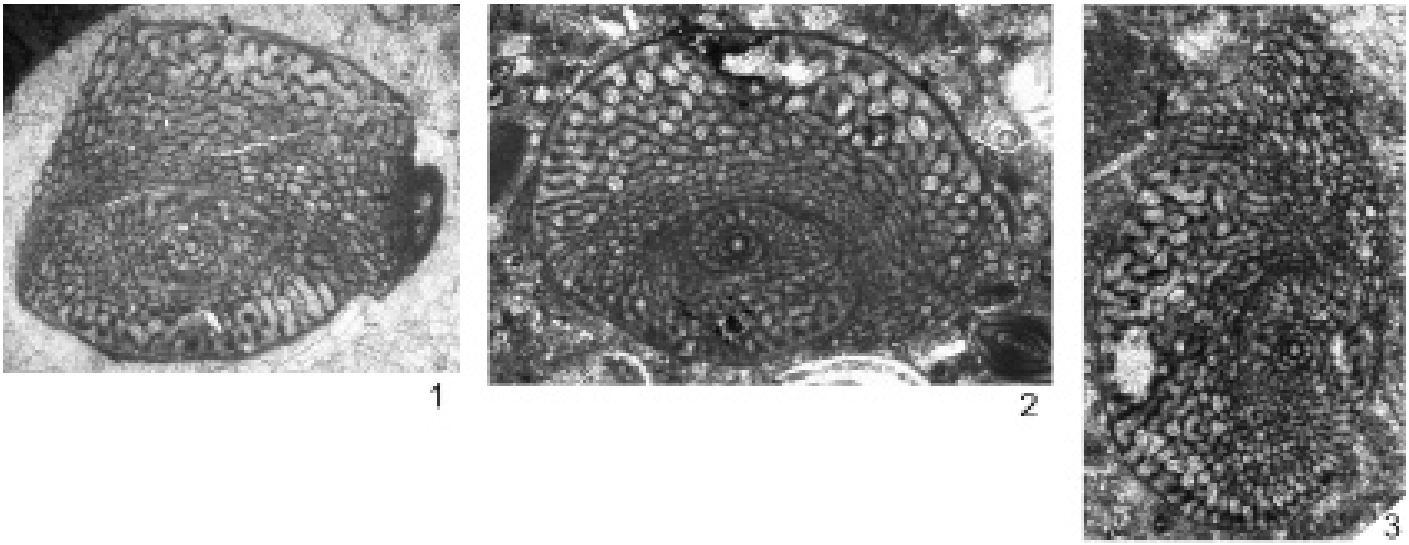

Fig. 11 *Dilatofusulina orthogonios* (Sheng and Sun) from the Gyanyima Limestone, southern Tibet, China. All specimens are magnified 25× (from Wang and Ueno, 2009)

Gyanyima Limestone display close similarities to those observed in the Paleotethys and are characteristic of warm-water platform deposits (Crasquin-Soleau *et al*., 2007; Wang, 2006). The brachiopod fauna, on the other hand, shows a mixed group of warm-water elements from the Tethys and cold-water elements from the Himalaya Realm (Li and Shen, 2005). In general, the Gyanyima Limestone occupied a paleogeographic position at lower latitude of the Neotethys during the late Changhsingian. The faunas are largely influenced by warm water from the subtropical Tethys, yet cold water from the Himalaya Realm played a subordinate role.

This study was supported by the National Natural Science Foundation of China.

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Report by Y. Wang, T. Grunt, S.Z. Shen, E. Leven, X.D. Wang, V. Golubev, Q.H. Shang, A. Markov, W. Wang

The joint Project of "Comparative investigation and correlation of the Late Permian (Lopingian and Tatarian) of China and Russia" has been executed since 2007 with support from the National Science Foundation of China (40711120374) and All Russian Fundamental Foundation (GREN # 06-05-39015 and RFFI # 09-05-01009). The main goal of the project is a comparative investigation and correlation of the uppermost deposits of the Upper Permian from South China and the Eastern European Region of Russia, as well as the detailed correlation of the Lopingian Series of the global scale elaborated for the normal-marine deposits of Equatorial climatic zone and the Tatarian Series of the East-European Regional Scale applicable outside of the Tropical zone. Preliminary results have been published in *Permophiles* #53.

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Report of the International Workshop on Precambrian-Cambrian and Permian-Triassic Transitions (2009.11.15~2009.11.16, Nanjing, China)

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The Neoproterozoic-Cambrian and the Permian-Triassic transitions are the most critical intervals during earth history. Many important discoveries and advances in understanding the history of life have come from these two intervals in China. The most important examples include the Ediacaran phosphatized embryo fossils, the famous Early Cambrian Chengjiang biota, and the most extensively studied Meishan section to understand the largest mass extinction during the Phanerozoic. Recent studies indicate that some biological, geological and geochemical events such as the presence of united continents, global glaciation, intensive volcanism, biotic mass extinctions, radiations and associated C-, O-, S-, and Sr-isotope fluctuations around the Neoproterozoic-Cambrian transition also occurred in the Permian-Triassic transition. Thus, the stratigraphic records in these two transitions represent a massive archive of unique natural experiments on the coupled earth-life system.

In order to initiate a collaborative research program to bring different expertise and resources to bear on the two most important critical intervals, a workshop (Sino-US Critical Transition in History of Life) was held on November 15-16, 2009, in Nanjing, China. The impetus of this workshop lies in further intensifying the Sino-US cooperation in paleontology and related disciplines to understand the biological and physio-chemical processes that shaped the history of life during these two intervals. The workshop aimed towards a broader discussion to explore more intensive scientific cooperation to investigate the origin and evolution of biodiversity and coupled multiple geochemical patterns, biostratigraphical, geochronological and magnetostratigraphical framework, molecular signatures and biomarkers with different approaches.

The workshop was jointly organized by Shuzhong Shen, Maoyan Zhu, Douglas Erwin, Shuhai Xiao and Liu Yu. More than 50 scientists who work on these two transitions attended the workshop. 19 talks (see below) were presented during the workshop. All speakers were invited. A half-day summit discussion was organized on the morning of 16th, November by Shuzhong Shen and Derek Briggs. A-week field trip (from November 8th to 14th) was organized before the workshop. About 15 participants joined in the field excursions to investigate the Precambrian-Cambrian and Permian-Triassic sequences in the Three Gorge area in Hubei Province and the Laibin area in Guangxi Province of South China. The nineteen presentations are listed below:

Changqun Cao. An introduction of the Permian-Triassic Meishan cores and the cores of the Duoshantou Formation in the Yangtze Gorges area.

Charles Henderson. Resolution potential of conodont biochronology and timing of calcimicrobial community at the PTB interval.

Daniel Rothman. Dynamic analysis of the end-Permian carbon isotopic event.

Derek Briggs. Burgess Shale-type faunas in the early Paleozoic.

Douglas Erwin. Role of modeling in understanding evolutionary diversifications.

Frank Dudás. High resolution Sr isotope stratigraphy across the PT boundary at Meishan.

Jonathon Payne. Calcium isotope constraints on Permian-Triassic boundary events.

Maoyan Zhu. Processes and Environmental Background of the Cambrian Explosion of Animals: Problems and Perspectives.

Roger Summons. The great mass extinction: not an impact but a slow moving train wreck!

Samuel A. Bowring. Testing models for the cause of the end-Permian extinction using high precision U-Pb geochronology.

Shucheng Xie. Two episodic changes in the Earth surface system across the Permian-Triassic boundary: a possible model for Earth intrinsic triggers of Phanerozoic crises.

Shuhai Xiao: On the eve of the Cambrian animal radiation: the Ediacaran fossil record and its implications for the early evolution of complex life forms and ecosystems.

Shuzhong Shen. A brief introduction of the project on the comparative study of the Precambrian-Cambrian and Permian-Triassic transitions.

Timothy Raub. Paleomagnetism for chronometry, geography, and oxidative change across the Cryogenian-through-Cambrian and Permian-Triassic transitions.

Yanan Shen. Redox chemistry of ancient oceans.

Yigang Xu. Identification and characterization of the mantle plume in the Emeishan large igneous province.

Yongfei Zheng. An oxygen isotope proxy for cold paleoclimates and continental glaciations in the Neoproterozoic.

Zhenyu Yang. Fast two-stage eruptions of Emeishan continental flood basalts: geochemical and magnetostratigraphic constraints.

This workshop was supported by National Natural Science Foundation of China and State Key Laboratory of Palaeobiology and Stratigraphy

Dr. Liu Yu of the Earth Science Division of NSFC gave an opening speech at the workshop.

Workshop in the International Conference Hotel in Nanjing

Participants at the Daxiakou Section (Permian - Triassic), Hubei Province

Report on the first IGCP 572 field workshop, Sept. 2-6, 2009, in Antalya, southern Turkey

By Aymon Baud, Sylvie Crasquin and Steve Kershaw

The IGC Programme 572 aims to investigate the recovery of ecosystems following the end-Permian mass extinction through analyses of the rock and fossil records via studies of biostratigraphy, paleontology, paleoecology, sedimentology, geochemistry and biogeochemistry.

A one-day meeting, Sept. 3, was organized at the Engineering Faculty Akdeniz University in Antalya with the help of Assistant Professor E. Kosun. About 30 participants (Fig. 1) were welcomed by the Dean of the Faculty and the Director of the Geological Institute. The opening of the session was dedicated to the memory of Jean Marcoux with a reminder of his entire scientific career and his work on the Permian and Triassic of the area.

A. Baud presented the first talk with an introduction to the field trip and the main topics that were discussed on the Permian-Triassic transition outcrops. The basal Triassic recovery of ostracods was the subject of the second presentation by M-B. Forel, with examples taken from Çürük dağ. Charles Henderson discussed the correlation of the microbialite facies and species of *Hindeodus* in the P-T Dawen section (Chen *et al*., 2009) of China. After lunch, S. Kershaw gave a talk on the microbialites and discussed with the participants about the link or not with the oolite deposits. Finally, A. Poisson presented an overview of the geology of the area focused on neo-tectonic and recent deposits.

A. Baud, S. Crasquin and S. Kershaw led the three days field workshop, Sept. 4-6 (Crasquin et al., 2009). Fifteen participants (Fig. 2) attended this field trip with great interest and took part in lively discussions on the outcrops. Firstly, the geology of the mountains located west of Antalya was introduced. One of the best exposures of the Permian-Triassic transition is at the Çürük dağ, a section more than 1000m thick of shallow water carbonate (middle-upper Permian to lower Triassic) situated at about 15 km NW of Kemer (Fig. 3). In this section, the Pamuçak Formation is represented by a thick cyclic succession of inner to outer platform facies (Guadalupian to Lopingian). These spectacular and recently re-studied outcrops of the Çürük dağ allowed reconstruction of the first steps of the Triassic transgression and the microbialite development. The 4 stops of the day were made on the crest of the Çürük dağ, the first one at the Permian-Triassic transition (Coord. N 36° 41' 32'', E 30° 27' 40'', alt. 1425 m), the second one a little higher at the thrombolite facies, the third one at the oolite facies, and the fourth at the overlying marly limestone and yellow shale unit. Extensive discussions were developed about unconformities, and subaerial exposures versus submarine dissolution.

For the second day, the participants moved to the locality of Demirtaş, SE of Alanya. The Antalya Nappes of the southern allochthons of the central Taurides (upper diagenesis grade) appears as a tectonic window below the metamorphic Alanya Nappes that are up to blue schist grade. The section is situated NE of Demirtaş, just above the paved road leading to the village of Kasiaglu (location; N 36°28.96' E 32°14.99', alt. 150m). The Lower Triassic Sapadere Formation overlies the Upper Permian Yüglüktepe Formation. The basal domal stromatolites are also present at this locality. Small carbonate precipitated fans (< 0.5 m) that resemble abiotically precipitated stromatolites were found in one limestone bed. No large carbonate mounds were preserved at this locality. The capping unit at this locality is an 8 m thick cross-bedded oolite.

Fig 1. Participants to the IGCP 572 one day meeting at the Engineering Faculty Akdeniz University in Antalya, south Turkey.

For the last day, the participants went to the locality of Oznur Tepe located about 10km NE of Gazipaça on the eastern side of Antalya Bay (Coord. N 36°19'58'', E 32°21'32''). The Oznur Tepe site and sections are exposed in a river cut, and dip steeply, so a vertical section of outcrop was easily

Fig. 2. Participants of the IGCP 572 field workshop in the Demirtas quarry, Sept. 5, 2009

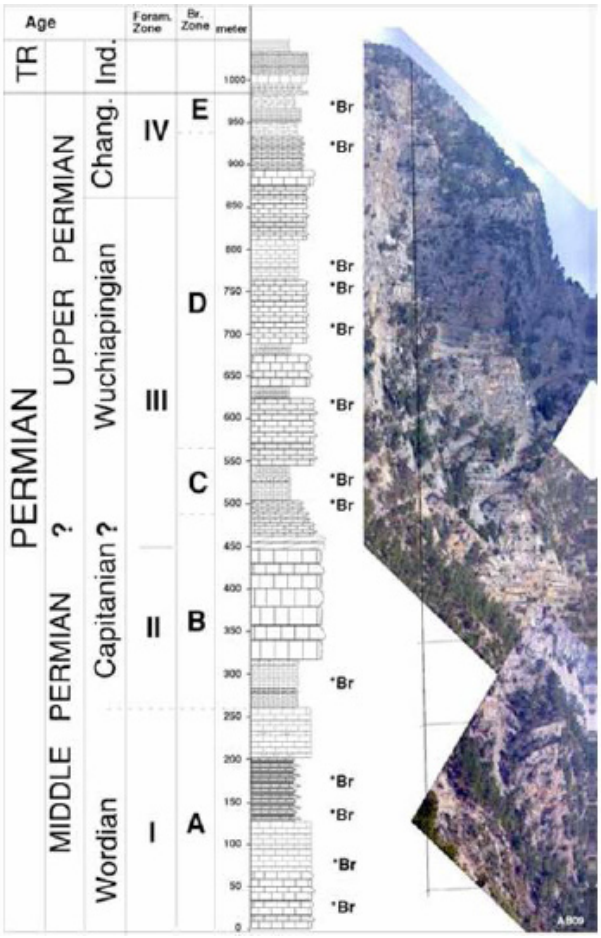


Fig. 3. (left): One of the best exposures of the Middle Permian to basal Triassic limestone succession is at the Çürük dağ, a section more than 1000m thick of shallow water carbonate situated at about 15 km NW of Kemer, near Antalya. In this section, the Permian Pamuçak Formation is represented by a thick cyclic succession of inner to outer platform facies (Guadalupian to Lopingian).

The figure represents the section (Br= Brachiopod-rich levels) with the south flank scaled and the photo orientated to fit the log (Baud and Marcoux, in Crasquin *et al.* 2009).

The Foraminifera zones I to IV have been defined in the Taurus by D. Altiner and according to L. Angiolini there are five Brachiopod assemblages, here A to E. An interesting point for discussion is that: according to the Foraminifera the boundary between Guadalupian and Lopingian is between zones II and III with the disappearance of the large fusulinids, but according to the brachiopod distribution this boundary may be higher up.

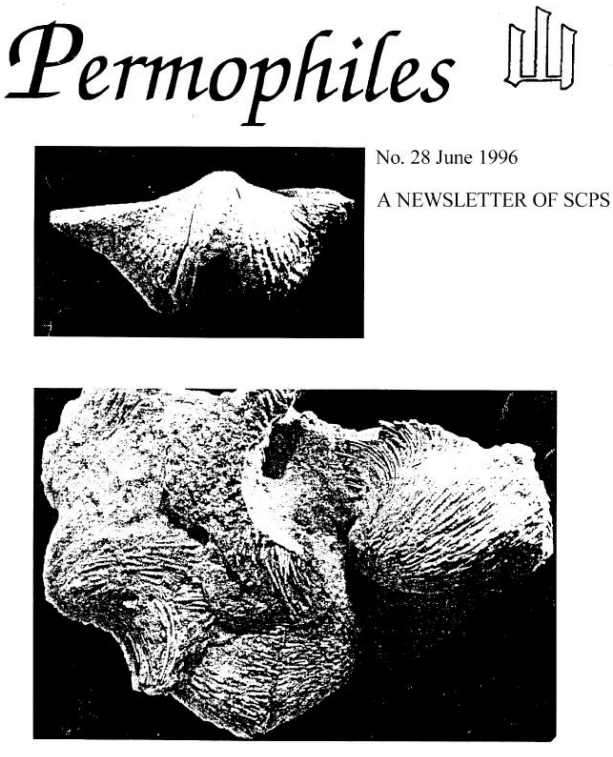
accessed along the river path. At the base of the section is a nice outcrop of a Late Permian erosion surface overlying thick Late Permian shallow water carbonate. Above the erosion surface a skeletal grainstone marks the beginning of transgression leading to the earliest Triassic small domal stromatolites. Above, the main development of thick tabular and domal stromatolites dominate the facies throughout the microbialite unit, with only small amounts of thrombolitic microbialite in contrast to the interlayered thrombolites and stromatolites of Çürük dağ. The differences between Çürük dağ and Oznur Tepe / Demirtaş suggest different conditions of formation. The reasons for these differences were discussed on the outcrop.

At the end of the day, all the participants came back to Antalya, with a lot of outcrop pictures and collected samples, very happy as a result of lively discussions under warm sunny skies.

References

Chen, J., Beatty, T.W., Henderson, C.M., and Rowe, H., 2009. Conodont biostratigraphy across the Permian-Triassic boundary at the Dawen section, Great Bank of Guizhou, Guizhou Province, South China: Implications for the Late Permian extinction and correlation with Meishan. Journal of Asian Earth Sciences, 36, p. 442-458.

Crasquin, S., Baud , A., Kershaw, S., Richoz, S., Kosun, E., and Forel, M. B., 2009, The Permian-Triassic transition in the Southwestern Taurus Mountains (South Turkey), in Baud, A., editor, IGCP 572 annual Meeting & Field Workshop in southern Turkey, Antalya, Sept. 2-6, 2009: Field guide book. 48 pp.



SUBMISSION GUIDELINES FOR ISSUE 55

It is best to submit manuscripts as attachments to E-mail messages. Please send messages and manuscripts to my E-mail addresses; hard copies by regular mail do not need to be sent unless requested. Please only send a single version by E-mail or in the mail; if you discover corrections before the deadline, then you may resubmit, but indicate the file name of the previous version that should be deleted. Manuscripts may also be sent to the address below on diskettes prepared with a recent version of WordPerfect or Microsoft Word; printed hard copies should accompany the diskettes. Word processing files should have no personalized fonts or other code and should be prepared in single column format. Specific and generic names should be italicized. Please refer to Issue #46 of Permophiles (*e.g.* Nurgalieva *et al.*) for reference style, format, *etc.* Maps and other illustrations are acceptable in tiff, jpeg, eps, bitmap format or as CorelDraw or Adobe Illustrator files. The preferred formats for Adobe Pagemaker are Microsoft Word documents and bitmap images. We use Times Roman 12 pt. bold for title and author and 10 pt. (regular) for addresses and text (you should too!). Please provide your E-mail addresess in your affiliation. Indents for paragraphs are 0.20 inch; do not use your spacebar. Word processing documents may include figures embedded at the end of the text, but these figures should also be attached as separate attachments as bitmaps or as CorelDraw or Adobe Illustrator files. Do not include figure captions as part of the image; include the captions as a separate section within the text portion of the document. If only hard copies are sent these must be camera-ready, *i.e.*, clean copies, ready for publication. Typewritten contributions are no longer acceptable. All the contributors must provide electronic versions of your text and elctronic or camera-ready hard copies of figures.

Please note that we prefer not to publish articles with names of new taxa in Permophiles. Readers are asked to refer the rules of the ICZN. All manuscripts will be edited for consistent use of English only.

I currently use a Windows XP PC with Corel Draw 13, Adobe Page Maker 7.0, Adobe InDesign (CS3), Adobe Photoshop 7 and Microsoft Office programs; documents compatible with these specifications will be easiest to work with.

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Submission Deadline for Issue 55 is
Friday, June 11, 2010

IN MEMORIAM

Professor Zunyi Yang (1908-2009)

We mournfully inform you that Professor Zunyi Yang passed away on September 17, 2009, aged 101 (1908-2009). Professor Yang graduated from and became a faculty member of the Department of Geology, Qinghua University in 1933. In 1935 he received a government award to study at Yale University, and obtained the doctor degree there in 1939. He returned to China and was engaged as professor and department head of the Zhongshan University (Guangdong), and later professor of the Qinghua University. In 1952, the geological departments of Qinghua University, Beijing University and other universities were incorporated to establish a new independent college—the Beijing College of Geology. He was nominated as one of the organizers of that college, which was later renamed as the China University of Geosciences in 1987, and remained there until his death.

As the founder of Chinese education of paleontology and stratigraphy, he was the author of the first Chinese "Textbook on Paleontology"(1956), the initiator of the first Chinese university speciality of paleontology and stratigraphy(1960), and teacher of the first Chinese course on "Biostratigraphy". A half century after Li's introduction on Chinese geology to international readers, Yang, Chen and Wang published "The Geology of China" (1986) in the series of Oxford Monographs on Geology and Geophysics. As a paleontologist and teacher, he is well-known for his broad knowledge on various fossil taxa and different stratigraphic periods. His special interests, however, was focused on Permian-Triassic stratigraphy and mollusk and brachiopod fossils. He has published a number of paleontological works on these two fossil categories. He set up the Chinese panel of Triassic stratigraphy and published papers and special chapters on the Triassic stratigraphy of China. Particularly, he organized the Chinese working group on the Permian-Triassic Boundary and was the leader of IGCP 203 (Permian-Triassic events of East Tethys region and their intercontinental correlation) and co-leader of IGCP 272 (Late Paleozoic and Early Mesozoic Circum-Pacific events and their global correlation). Results of these projects were published in Cambridge University Press. His works greatly contributed to the final establishment of the GSSP of Permian-Triassic boundary at Meishan section, Zhejiang Province, China.

Professor Yang's social services and honours include Member of the Academician of China, Vice-Chairman of the Paleontological Society of China, executive council member of the Geological Society of China, chief editor of the Acta Paleontologica Sinica, deputy chief editor and editorial member of various journals. He has also won several national and societal awards. His death is a great loss to China's geological society and to the paleontological circle of the world. The task force of Permian-Triassic boundary pays its sublime respect to his long and faithful service.

Hongfu Yin
Chairman, Task force of Permian-Triassic Boundary
China University of Geosciences at Wuhan

Dr. Aleksandr Klets (11.06.1957 - 05.09.2009)

Aleksandr Klets was born on June, 11 1957 in the town Amvrosievka of the Donetsk region, Ukraine. His Ukrainian Cossack origin was quite obvious by his specific accent, moustache, temperament, boldness, being light on his feet, and his reckless nature. After school he entered Novosibirsk State University (Russia) and then moved to Khabarovsk after his successful graduation from the university. He worked for 13 years in the geological survey "Dalgeologiya", as a member of the paleontological and stratigraphic department of the Khabarovsk geological-mapping expedition. These were years of the wonderful and striking experience as a field geologist and very fruitful for collecting his own paleontological material. He started to study brachiopods that became an excitement of his life. Aleksandr Klets obtained his PhD in geology in 1988. In 1992 he returned to Novosibirsk and was employed by SNIIGGiMS (Siberian Research Institute of Geology, Geophysics and Mineral Resources) as senior research scientist of the department of stratigraphy and paleontology. In 1996 he obtained a position in the United Institute of Geology, Geophysics and Mineralogy, Siberian Branch of RAS, and later in the Institute of Petroleum Geology and Geophysics SB RAS.

During more than 25 years Aleksandr Klets became a distinguished Russian paleontologist with his main scientific research connected with Upper Paleozoic paleontology and stratigraphy (Devonian-Carboniferous-Permian) and brachiopods from Siberia and Russian Far East were the main objects of his studies. The most important results of his work can be found in more than 120 scientific papers, devoted to geology, stratigraphy and paleontology of Paleozoic sediments of Khabarovsk and Amur regions, Siberian Platform and Kuznetsk Basin, West Siberia and Urals, as well as the paleoecology, morphology, systematics, facies and paleobiogeography of brachiopods.

He participated in the creation of the stratigraphic base for the 1:50,000 and 1:200,000 scale geological maps for the territory of the Russian Far East and Yakutiya. In addition, he was one of the authors of the modern version of the regional startigraphic charts for Carboniferous and Permian of the Verkhoyanie-Okhotsk and Mongolia-Okhotsk regions. In recent years he was working on the compilation of paleontological and lithostratigraphic data on the Paleozoic of the West Siberia Geosyncline for the geological map of 1:1,000,000 scale on the Pre-Jurassic complex upper boundary.

Aleksandr Klets was an active participant of the Carboniferous and Permian committees of the Russian Stratigraphic Committee, as well as international meetings and symposia on Upper Paleozoic paleontology and stratigraphy. In 2008 he moved to Krasnoyarsk where he was a professor and head of "Oil and gas geology" chair in the Siberian Federal University.

Alexandr was very active and cheerful person. His hobby and life-time passion was soccer. He played it all year round since he was a student, taking part even in winter-soccer games. Another passion was cars; he was a very experienced driver and covered thousands of kilometers around immense space of the entire Russia as well as abroad. According to an old Russian saying Aleksandr fulfilled man's mission – to bring up a son, build a house, and plant a tree. Together with his wife Tatyana they brought up two sons, Aleksey and Vladimir. Two years ago their first granddaughter was born. He built mainly by himself a cottage in the country-side, where he planted pine trees. He was a very loyal person and always was surrounded by friends who adored his easy temperament and ability to cheer up a group with a joke. Sadly, on September 5th 2009 Aleksandr passed away suddenly. He will be missed by many.

Igor Budnikov and Leonid Peregoedov

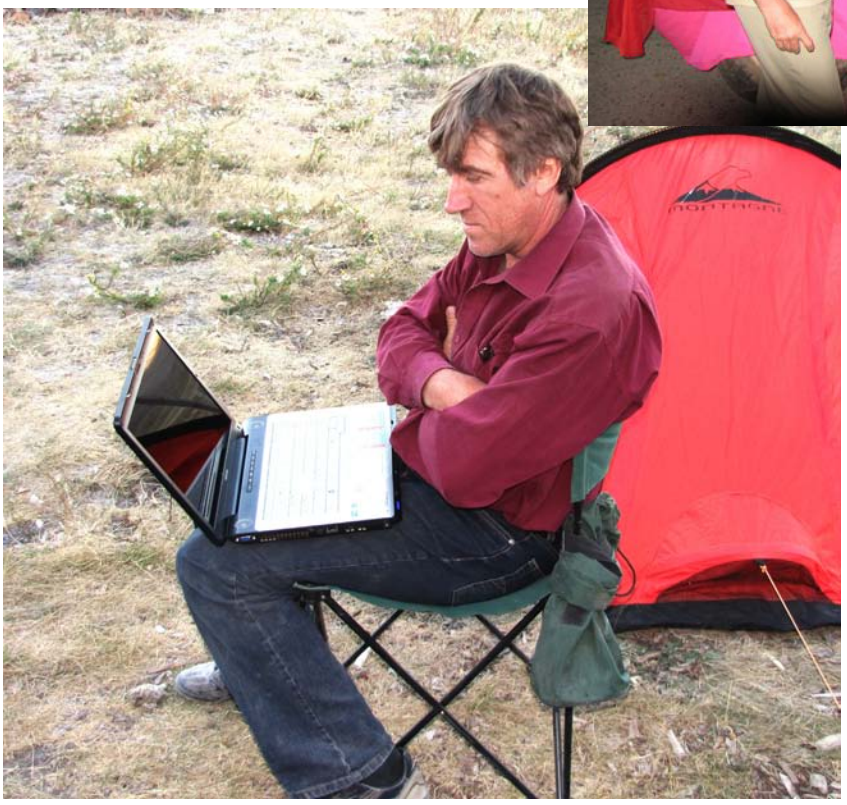
Siberian Research Institute of Geology, Geophysics and Mineral Resources, Krasnyi pr 67, Novosibirsk, 630104 Russia

Ruslan Kutygin

Institute of Diamond and Precious metals Geology, Yakut Scientific Center, Siberian Branch of the Russian Academy of Sciences, Lenina pr. 39, Yakutsk, 677891 Russia

Aleksandr in Argentina in the Calingasta-Uspallata Subbasin, with the Cordillera in the background.

Aleksandr enjoying the Carnaval at Trelew, Eastern Argentina in 2009



Aleksandr listening to Russian music near his tent in Patagonia

ANNOUNCEMENTS

International Geological Correlation Program - UNESCO
IGCP 572: Recovery of ecosystems after
the Permian-Triassic mass extinction

Third annual Fieldworkshop at GUtech, Muscat, Oman February 20-26, 2010
First circular

Scientific Committee for the Third IGCP 572 Fieldworkshop : Michaela Bernecker (GUtech, Muscat), Sylvie Crasquin (Paris), Alda Nicora (Milano), Aymon Baud (Lausanne), Charles Henderson (Calgary), Leopold Krystyn (Vienna) and Oliver Weidlich (Kassel).

Objectives

Much evidence indicates that many of Earth's ecosystems are under threat during the present day. This is nothing new, as Earth has suffered major extinction and upheaval on numerous occasions over the geological past, the most serious of which occurred during the Permian-Triassic transition. Of the major factors proposed to have caused the Permian-Triassic biotic crisis, including increased carbon dioxide concentrations, oceanic anoxia, hypercapnia, and rapid global warming, some are observed in the present day, and others are predicted for the near future. The Permian-Triassic rock and fossil records may thus record a natural experiment in global-scale ecosystem collapse that, if properly deciphered, could provide insights into the possible responses of modern ecosystems to present day climate and environmental change.

The field workshop aims to investigate the recovery of ecosystems following the end-Permian mass extinction through analyses of the rock and fossil records via studies of biostratigraphy, paleontology, paleoecology, sedimentology, geochemistry and biogeochemistry.

Potential participants : Members of the IGC 572 Program, Members of the Permian Subcommission on Stratigraphy, Members of the Triassic Subcommission on Stratigraphy, all interested Geoscientists from Middle-East and Oil Companies.

Schedule: February 20-26, 2010
The GuTech buiding, Muscat area, Oman

The topics of the one and half day conference at the Gutech, February 21 and 22, 2010, will address recovery patterns of various fossil groups; reconstruct global Permian-Early Triassic oceanic and climatic conditions; outline P/Tr ecosystem types; and correlate these types of data with a global stratigraphic framework. New data on Permian-Triassic transition in Oman will be presented.

Conference room and a meeting room for the organizing committee, meeting convenors fieldtrip leaders and IGCP officers will be provided by GUtech for the one day and half Conference.

Abstract submission deadline October 15, 2009

Tentative Costs of the 6 days fieldworkshop; 750 € (Conference fee at GUtech; 150 €)

The four and half days fieldworkshop excursion will offer

to the participants the opportunity to visit the magnificent outcrops of the Oman Mountains, that provide unparalleled access **to the Permian-Triassic transition units along the Gondwana margin of the Tethys, from shallow carbonate platform, Tilted block margin, continental slope** and **abyssal plain deposits.**

Fieldtrip Organisation and Schedule:

Leaders: O. Weidlich, A. Baud, B. Beauchamp, L. Krystyn, A. Nicora, C. Henderson, S. Richoz, T. Aigner

The maximum number of participants to the fieldtrip will be 30

Duration: 4 1/2 days involved

Cost : The estimation of the cost of the fieldtrip is 600 € (4 1/2 days)

Tentative itinerary:

First Half Day, February 22: Permian-Triassic transition in Wadi May (Oliver Weidlich)

February 23: Permian-Triassic bloc in Wadi Wasit (A. Baud, L. Krystyn)

February 24: Permian-Triassic transition on Saiq Plateau (A. Baud, T. Aigner)

February 25: Permian-Triassic transition in deep water: the Buday'ah section (A. Baud, B. Beauchamp, L. Krystyn, A. Nicora, C. Henderson)

XVII ICCP (July 3-7, 2011, Perth) conference excursion was described in *Permophiles* #53

XVII International Congress on Carboniferous and Permian

(ICCP), University of Western Australia, Perth, July 3-7, 2011

For more information contact Zhong-Qiang Chen, Chair of XVII ICCP at zqchen@cyllene.uwa.edu.au.

Look for detailed information in *Permophiles* #55 this June.

Perth at night

IGCP 572 session "Biotic recovery after mass extinction events" and workshop; 3rd International Palaeontological Congress (IPC 3), London; June 28 to July 3, 2010

Keynote speaker: Hugo Bucher

Organizer: Richard Twitchett, Steve Kershaw & Sylvie Crasquin

The history of life on Earth has been shaped by a number of extinction events. This symposium will bring together a range of scientists working on different events and different fossil taxa, both terrestrial and marine, at a range of geographic and temporal scales. Particular emphasis will be placed on examining the similarities and differences in ecosystem response between the events, and how the biotic recovery is controlled by, or responds to, changes in climate, ocean state and palaeo-environment.

More information can be found at the following websites: www.ipc3.org and www.igcp572.org
Any questions, please contact conveners: Richard J. Twitchett (richard.twitchett@plymouth.ac.uk) or Steve Kershaw (stephen.kershaw@brunel.ac.uk) or Sylvie Crasquin (sylvie.crasquin@upmc.fr).

Wuhan, China
June 3-6, 2010

Call for Abstract and Application for Small Grant-in-Aid

IGCP 572: Permian-Triassic ecosystems: Collapse and rebuilding

Convenors: Jinnan Tong[1] & Zhong Qiang Chen[2]
[1]China University of Geosciences, Wuhan. Email: jntong@cug.edu.cn
[2]The University of Western Australia, Perth. Email: zqchen@cyllene.uwa.edu.au

The International Geoscience Programme (IGCP) 572 is targeting the Permian-Triassic mass extinction and subsequent recovery with emphasis on ecosystem's restoration after the greatest death of Earth life. One of her major activities in 2010 is to investigate the P-Tr ecosystem's collapse and rebuilding in low-latitude regions. South China records the spectacular P-Tr boundary and Lower-Middle Triassic sequences and thus enables to test the tempo and mechanism of the marine ecosystems' collapse in the P-Tr mass extinction and subsequent recovery. Thus, IGCP 572 is sponsoring an Annual Meeting and Field Workshop at the International Geobiology Conference (ICG^{2010}).

This symposium aims to investigate the mechanisms of ecosysem's collapse and rebuilding in the P-Tr mass extinction and its aftermath through multidisciplinary studies. The topics will address: causes and pattern of P/Tr mass extinction, Early Triassic microbialites, recovery patterns of various fossil groups and ecosystems. We will also organize three field excursions, including: **A1** (pre-conference): GSSPs of the Changhsingian and P-Tr boundary (Changxing, Zhejiang) and Lower Triassic sequences and biota (Chaohu, Anhui); **B1** (post-conference): Geobiology of P-Tr microbialite and carbonate petroleum source rocks in Chongqing-Guangyuan areas, western China; **B3** (post-conference): P-Tr boundary to Middle Triassic sequences and ecosystems in various facies in Guizhou. In particular, during the excursion B3, we will investigate the well-known Qingyan biota of Anisian age, ~300 fossil species recorded in a 90-m-thick unit, which marks biotic recovery from the P-Tr crisis. Ecosystem recovery through Early-Middle Triassic will be examined in various facies settings. The exceptionally preserved Early Triassic trace fossil Lagerstätten nearby the Guiyang City will also be investigated.

Small travel grants are also available for IGCP 572 members to apply and support their participation in the Wuhan conference and field excursions.

If you are interested in contributing to this session, please contact the convenors or submit your abstracts directly via the ICG^{2010} website at
http://www.geobiology.net.cn/2010meeting
http://www.geobiology.net.cn

Abstract deadline: February 28, 2010 (extended)

IUGS
International Union of Geological Sciences

United Nations Educational, Scientific and Cultural Organization

Application for Funds for the International Geobiology Conference

Wuhan, China; June 3-6, 2010

The International Geoscience Programme (IGCP) is sponsoring a session at the International Geobiology Conference titled "IGCP 572: Permian-Triassic ecosystems: collapse and rebuilding". A small amount of money is available from IGCP 572 (Restoration of marine ecosystems following the Permian-Triassic mass extinction: Lessons for the present) to help defray meeting and field excursion costs for students and researchers who attend the conference and field workshop. If you are interested in applying for funds from the IGCP, please fill out this form and either e-mail it or send it via postal mail to the addresses below by February 20, 2010. The amount awarded will depend on the number of applicants, geography of applicants, and stated need for funds.

Deadline for applying for funds: E-mailed applications must be received by 12:00 midnight CST on February 20, 2010, and mailed applications must be postmarked by February 20, 2010.

Send applications to:

Dr. Jinnan Tong
Faculty of Earth Sciences
China University of Geosciences
Wuhan, 430074
China
E-mail: jntong@cug.edu.cn

Dr. Zhong Qiang Chen
School of Earth & Environment
The University of Western Australia
35 Stirling Highway, Crawley, WA 6009
Australia
E-mail: zqchen@cyllene.uwa.edu.au

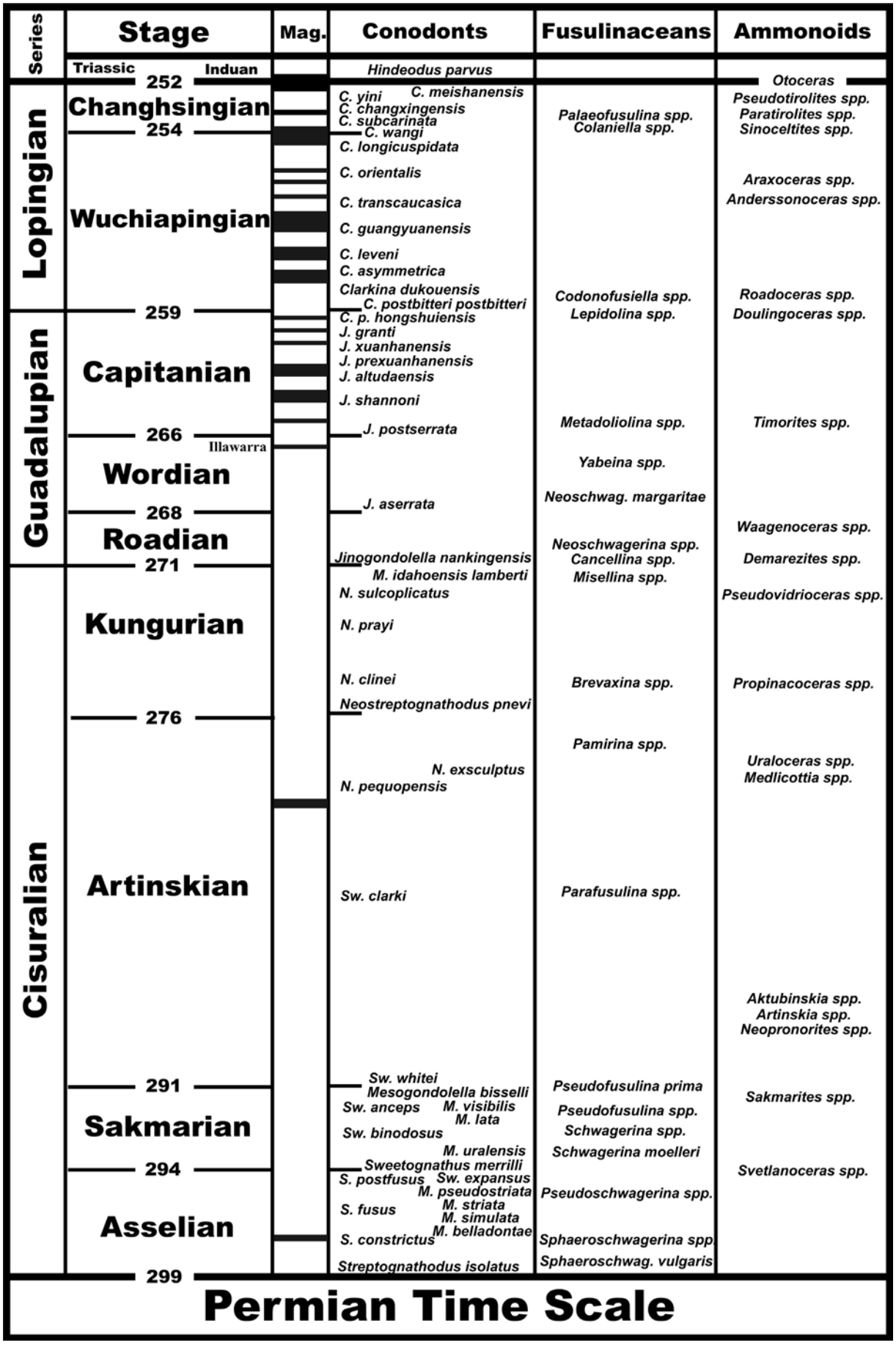
Applicant's Name:

Institution and E-mail Address:

Are you a student? _____
If so, who is your thesis or dissertation advisor? _____

If you are planning on presenting a talk in the special session, please state its title:
Yes, I hope to present in a special session:

Please briefly state in 1-2 sentences your need for funds to help with costs related to attending ICG[2010] and presenting at the IGCP 572 session.


Series
Stage
Mag.
Conodonts
Fusulinaceans
Ammonoids
Triassic
Induan
252
Hindeodus parvus
Otoceras
Lopingian
Changhsingian
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C. yini
C. meishanensis
C. changxingensis
C. subcarinata
C. wangi
Palaeofusulina spp.
Colaniella spp.
Pseudotirolites spp.
Paratirolites spp.
Sinoceltites spp.
C. longicuspidata
C. orientalis
Araxoceras spp.
Anderssonoceras spp.
Wuchiapingian
C. transcaucasica
C. guangyuanensis
C. leveni
C. asymmetrica
Clarkina dukouensis
Codonofusiella spp.
Lepidolina spp.
Roadoceras spp.
Doulingoceras spp.
259
C. postbitteri postbitteri
C. p. hongshuiensis
Guadalupian
J. granti
J. xuanhanensis
J. prexuanhanensis
Capitanian
J. altudaensis
J. shannoni
Metadoliolina spp.
Timorites spp.
266
J. postserrata
Illawarra
Yabeina spp.
Wordian
Neoschwag. margaritae
J. aserrata
268
Waagenoceras spp.
Roadian
Neoschwagerina spp.
Cancellina spp.
Misellina spp.
Demarezites spp.
271
Jinogondolella nankingensis
M. idahoensis lamberti
N. sulcoplicatus
Pseudovidrioceras spp.
Cisuralian
Kungurian
N. prayi
N. clinei
Brevaxina spp.
Propinacoceras spp.
Neostreptognathodus pnevi
276
Pamirina spp.
N. exsculptus
Uraloceras spp.
Medlicottia spp.
N. pequopensis
Artinskian
Sw. clarki
Parafusulina spp.
Aktubinskia spp.
Artinskia spp.
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291
Sw. whitei
Mesogondolella bisselli
Pseudofusulina prima
Sakmarites spp.
Sw. anceps
M. visibilis
M. lata
Pseudofusulina spp.
Sakmarian
Sw. binodosus
Schwagerina spp.
M. uralensis
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294
Sweetognathus merrilli
Svetlanoceras spp.
S. postfusus
Sw. expansus
M. pseudostriata
Pseudoschwagerina spp.
S. fusus
M. striata
M. simulata
M. belladontae
Asselian
S. constrictus
Sphaeroschwagerina spp.
Sphaeroschwag. vulgaris
Streptognathodus isolatus
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Permian Time Scale

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