

INTERNATIONAL
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JURASSIC
STRATIGRAPHY

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Newsletter 34/2

Edited by Nicol Morton and Paul Bown

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CHAIRMAN'S REPORT

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The period since ISJS Newsletter no. 33 was circulated in 2006 has been the busiest and, probably, the most eventful that I can recall – for better ... and for worse. There have been many positive aspects (including a lot of carefully focussed work leading to progress on a number of topics) but also some negative events (especially three tragic deaths) reminding us that the work of the Subcommittee is done voluntarily by individuals and that we are neither immortal nor immune from problems.

I illustrate the “better and worse” by reference to the country where I now live, France. Our French colleagues have a very active and large GFEJ (Groupe française d'Étude du Jurassique, see report by Bernard LATHUILIERE in the 2006 *ISJS Newsletter* 33, 39) but, with a few notable exceptions (Enay, Elmi etc.), had almost disappeared from international meetings such as the Jurassic Congress in Sicily, etc. This year the “better” is that they were very well represented in Krakow (September 2006) and in IGCP 506 in Bristol (July 2007) and it was good to see so many young researchers from France. The “worse” is that the French group have this year (2007) lost three stalwarts with the deaths of Serge ELMI (January), Henri GAUTHIER (April) and René MOUTERDE (August).

Krakow Congress

The highlight of the past year was undoubtedly the 7th International Congress on the Jurassic System in Krakow (Poland) in September. Our Polish and Slovak colleagues are to be congratulated for their superb planning and organisation, which included some inspired ideas, such as the Congress dinner being held 130 m underground in the Wieliczka Salt Mine! Public relations and publicity were also excellent with national and local television and radio coverage. [On a personal note, before the Congress I had a telephone interview at home by Andrzej WIERZBOWSKI for Polish Radio!]

The amount of work and preparation over many months for the Congress by all concerned (organisers and participants) is impressive and several aspects are reported in this Newsletter. Apart from our memories of the events, people and places, there are the tangible proofs in the 235-page Guidebook for the field excursions with a vast amount of new information and detail (published by the Polish Geological Institute), the 304-page book of Abstracts (published in *Volumina Jurassica* 4) with 226 presentations and 2 GSSP proposals, both published before the Congress. Post-Congress, there are in press the Congress proceedings book with over 30 papers and the revision of the classical Sieniradzki collection by Ewa GLOWNIAK and Andrzej WIERZBOWSKI, both to be published in *Volumina Jurassica*. The biggest problem I had was that my computer does not recognise some letters of the Polish alphabet, so we had to “anglicise” some names.

GSSPs

During the Congress most of the Subcommittee Stage Working Groups held business and discussion meetings.

In addition a number of papers were presented that were specifically directed at GSSP questions. From most groups there was significant progress to be reported and new information presented so that all except one (Tithonian) were in a position to report to the Subcommittee meeting before the close of the Congress their immediate plans for achieving a GSSP proposal. A tight deadline for these was proposed with the hope that several proposals could be completed by the summer of 2007, but this has proved to be too optimistic. My personal feeling after the Congress was that it would be interesting to see whether the Toarcian or the Kimmeridgian would come in first, but more on that later. Below I try to summarise the current situation (November 2007), especially for those GSSP proposals are still being prepared (see also the Working Group reports in this Newsletter).

Hettangian and Triassic/Jurassic Boundary.

Perhaps the sensations of the Congress were the presentations of two new candidate proposals for the base-Jurassic GSSP - Kuhjoch (Austria) and Waterloo Bay (Northern Ireland). The first had already been announced (e.g. in *ISJS Newsletter* 33 for 2006) and was more advanced; the second was new and preliminary and a complete surprise to almost everyone present! I vividly recall one comment of “how could such a section have remained so unknown for so long in a well-explored country like Great Britain?”. Another new proposal was for a carbon isotope excursion to be the primary marker. During post-Congress fieldtrip B1, the idea of a special Newsletter for rapid publication of details of the new proposals was born. Subsequently Convenor Geoff WARRINGTON and Secretary Gert BLOOS proposed inclusion of updates of existing proposals. These were published electronically, with the editorial help of Jackie LEES, as *International Subcommittee on Jurassic Stratigraphy Newsletter* 34/1 in July 2007. With 69 pages and a large number of figures and plates in colour, the file proved too large for general transmission as email attachment, so was posted on the website for free download. Paul BOWN arranged this so that various downloading options, of different sizes, are available. Unfortunately, prolonged illness and family problems for Geoff WARRINGTON meant that the update of the St. Audries' Bay proposal was delayed, but this will be available soon, hopefully as *Newsletter* 34/3. Thanks to Chris McROBERTS, a special website, password protected to be available for posting discussions to only the Working Group members, was established to facilitate the work of the Group.

Sinemurian. The Sinemurian GSSP in Somerset (S.W. England) was ratified by IUGS in 2000 and published in *Episodes* 25/1, 22-28, 2002. Involvements of the Convenor, Gert BLOOS and most members of the Working Group in the Hettangian Working Group have meant that investigation of formal subdivisions of the Sinemurian Stage has been delayed.

Pliensbachian. The Pliensbachian GSSP at Wine Haven in Yorkshire (E. England) was ratified by the IUGS in 2005 and published in *Episodes* 29/2, 93-106, 2006. The Convenor, Christian MEISTER, following the objectives and the recommendations of the Jurassic

Subcommission, has started work on the next step, which is to standardize and propose a GSSP for the Substages (Lower - Upper Pliensbachian) (see *ISJS Newsletter* 34/2). The Lower-Upper Pliensbachian boundary is quite well known in Euroboreal, Western Tethys and Pacific areas. However, even if the biostratigraphy based on ammonites seems to be quite precise in all these different paleogeographical domains, the main problem is strong provincialism and consequently correlation between the different regions. Further investigations to improve documentation in these areas and to document the magnetostratigraphy, isotope stratigraphy and biostratigraphy are required.

Toarcian. As reported by the Convenor, Serge ELMI, in *ISJS Newsletter* 33 (2006) and in the Abstracts Volume for the Krakow Congress (*Volumina Jurassica* 4, 5-16, 2006), the GSSP for the base of the Toarcian in the Peniche section (Portugal) had been identified and agreed informally by the members of the Working Group. Several further communications on the Peniche section were also presented during the Congress. No significant problems emerged during the Working Group session, so that it was only a matter of preparation of the formal proposal for voting within the Working Group and then the Subcommission. Unfortunately, Serge ELMI became seriously ill (the last communication I received from him, in mid October 2006, gave no indication of any problems with preparation of the GSSP proposal) so it was an immense shock to everyone to hear of his death on 27th January 2007. It is a great loss to us all. His colleague in Lyon, Pierre HANTZPERGUE, has been able to recover from Serge ELMI's computer what appear to be all the files relevant to the Peniche section and efforts are being made to reconstruct posthumously his proposal.

Aalenian & Lower/Middle Jurassic Boundary. The GSSP proposal of the Fuentelsaz section (Spain) was ratified by the IUGS in 2000 and published in *Episodes* 24/3, 166-175, 2001.

Bajocian. Proposal of the GSSP at Cabo Mondego section (Portugal) and ASP at Bearreraig, Isle of Skye section (NW Scotland) were ratified by IUGS in 1996 and published in *Episodes* 20/1, 16-22, 1997. The enhanced conservation status of the Cabo Mondego site is reported later.

Bathonian. The Working Group meeting during the 7th International Jurassic Congress in Krakow, chaired by the Convenor Sixto Rafael FERNANDEZ LOPEZ, agreed to submission of the proposal of the Ravin du Bès section as GSSP for vote in the Working Group. Members of the Working Group have completed the further investigations of both the Ravin du Bès near Digne, Hautes-Alpes (S.E. France) and Cabo Mondego (Portugal) sections. A formal proposal to select the Ravin du Bès section near Digne as GSSP, together with the Cabo Mondego section as ASP, has been submitted to Working Group members for an approval vote and will be followed by a submission to the Jurassic Subcommission.

Callovian. Research by the Working Group, Convenor John CALLOMON, to select the best marker for the base of the basal zone and subzone of the Callovian Stage, and of the best section for GSSP were completed in the early 1990s. The marker and section selected are the *Kepplerites keppleri* horizon in the Albstadt-Pfeffingen, Swabia (S. Germany) section. A description and discussion were published in the Proceedings of 5th International Jurassic Symposium (*GeoResearch Forum* 6, 41-54, 2000). Unfortunately, the paperwork leading to a formal proposal was never completed at the time, but is now under way. At the Working Group meeting during the 7th International Jurassic Congress in Krakow some minority reservations were expressed and it was agreed that a possible alternative section on the Russian Platform should be examined. A proposal for discussion has been submitted to the Working Group.

Oxfordian & Middle/Upper Jurassic Boundary

The Working Group, Convenor Guillermo MELENDEZ, has over the past five years decided to focus attention on two candidate sections, at Savouron, Provence (S.E. France) and Redcliff Point, Dorset (S.W. England). Descriptions of both sections were presented at the Krakow Congress. Most of the multidisciplinary work on the Redcliff Point section has been completed and will be published in *Volumina Jurassica* no. 6 (2008). Only part of the work on the Savouron section has been published; the rest has not yet been submitted to the Working Group. Detailed comparative work on the critical ammonite faunas across the boundary in both sections was carried out at Lyon and in the field during the summer of 2007. This proved that the detailed succession of ammonites established at Redcliff Point could also be recognised in the Savouron section, confirming the suitability of the *Cardioceras redcliffense* Horizon as the primary marker for the base of the Oxfordian Stage. Recent objections by some French colleagues to the elimination from consideration of another section in France seem difficult to justify. The situation remains that as soon as the results of work on the Savouron section are available, details of both sections will be submitted to members of the Working Group for selection and a proposal for GSSP and ASP submitted to the Subcommission.

Kimmeridgian. The basal boundary of the Kimmeridgian Stage has been, historically, a difficult problem because of faunal provincialism so that it became clear some time ago that the traditional Boreal/Subboreal boundary was significantly older than the Submediterranean/Mediterranean boundary. The former has several advantages, not least historical precedent. Therefore, a vote was held within the Working Group, convenor Andrzej WIERZBOWSKI, to use the Subboreal base of the Kimmeridgian as the level at which the GSSP should be placed and this was approved by a strong majority (67%) of the members of the Working Group. I decided that, to avoid any future problems, the same proposition should be put to the Voting Members of the Jurassic Subcommission and was approved by an even larger majority (77%). Therefore, the base of the Kimmeridgian Stage should be defined at the base of the Baylei Zone. On this basis a description of the Flodigarry section was given in the

Abstracts Volume for the Krakow Congress (in *Volumina Jurassica* no. 4, 2006). The Working Group members were then asked in a two-point ballot:

(1) That the Flodigarry section, Staffin Bay, Isle of Skye, Scotland be proposed as the GSSP section;

(2) Either that the *Pictonia flodigarriense* Horizon or the *Pictonia densicostata* Horizon should be the primary marker for recognition and correlation of the base of the Baylei Zone and the Kimmeridgian Stage.

Of the members of the Working Group who voted (71%), a majority (78%) voted for selection of the Flodigarry section as the section for the GSSP, but a small majority, only 52%, voted for *Pictonia flodigarriense* Horizon as the primary marker. As a result, a final decision on the GSSP for the base of the Kimmeridgian Stage was deferred until further investigations could be undertaken as to whether the *Pictonia flodigarriense* Horizon could be recognised beyond the Flodigarry section. This was completed during the summer of 2007. The results will soon be submitted to the Working Group members for a new vote on the primary marker horizon.

Tithonian. Progress in identifying a possible GSSP for the base of the Tithonian is the least advanced of any of the Jurassic Stages. The Working Group faces difficulties of precise correlation between sections as a result of extreme provincialism of the ammonite faunas has caused problems and selecting potential candidate sections for the Kimmeridgian-Tithonian boundary. Only the Contrada Fornazzo section, Sicily (S. Italy) has been formally proposed as candidate GSSP, published in *Revista Italiana di Paleontologia e Stratigrafia* 110, 329-338, 2004 (Proceedings of 6th International Jurassic Symposium). Completion of work on other possible candidate sections, notably Canjuers, is urgent.

Berriasian and Jurassic/Cretaceous boundary. Although this boundary is not technically the responsibility of the Jurassic Subcommission, it is reported here briefly because many members of the Jurassic Subcommission, including the Convenor William WIMBLEDON, are involved in this newly reformed group. The Convenor is also a Co-Leader of IGCP Project 506 and it was agreed that an augural meeting of the Working Group be held during the IGCP Project 506 symposium in Bristol (July 2007). This was a closed meeting (i.e. members only) during one evening and, although there are still 'hangovers' of entrenched views on "which ammonites should rule", there was enough new momentum for the group to be prepared to try to get somewhere, maybe even to abandon the ammonites and try other criteria. The Group decided to concentrate on the critical stratigraphical interval, effectively Jacobi/Grandis zones and equivalents and that various regional groups should urgently gather all the relevant biostratigraphical and other key data on the sections in their areas, preferably in a standard format (to be developed). These should be brought to the next meeting, which is planned for April 2008 in Marseilles, France. It was felt that it was unlikely that the August

2008 deadline, would be met but at least there should be some significant progress to show by then.

Jurassic Newsletter no. 34

The *International Subcommission on Jurassic Stratigraphy Newsletter* is our principle organ of communication between the Subcommission and those with an interest in the Jurassic. Contributions are invited and edited carefully for content and language by Nicol MORTON, put into a standard format, emailed to Paul BOWN who checks them again and assembles them into a single document integrating figures with text.

This year there have been exceptional circumstances with the presentation during the Krakow Congress in September 2006 of two new candidate sections for GSSP of the base of the Hettangian Stage and the Jurassic System. Detailed descriptions and discussions of neither of these had been published, so that it was decided to produce a special Newsletter devoted to the Triassic/Jurassic boundary GSSP, as Part 1 of Newsletter no. 34 for 2007. This would contain the details of the new candidate sections and updates of the proposals for the previously proposed sections. Interactive editing began in December 2006 and the Newsletter was published electronically as *International Subcommission on Jurassic Stratigraphy Newsletter* 34/1 in July 2007, edited by Paul BOWN, Nicol MORTON and Jackie LEES. There are 6 articles on the sections and proposals plus a list of the members of the Triassic-Jurassic Boundary Working Group, totalling 69 pages, with 46 figures (many in colour) and 4 plates. The size of the pdf file, at over 20 Mb, proved to be too large to distribute in the usual way; therefore, the email which was sent as the normal "cover" message gave details for free downloading from the Jurassic Subcommission website. Options were given to download the complete file with figures in colour, the complete file in black and white, or individual files for each of the articles.

The editing and preparation of the "normal" Newsletter, this one No. 34/2, has been delayed by a combination of circumstances. Most of the contributions had been received by early summer, but our work on the Triassic-Jurassic Boundary issue took far longer than expected. My wife and I then had a horrendous summer and autumn with family problems in Britain, including two deaths and funerals, which necessitated four trips to Scotland, and one to England between June and October. It was not until November that my part of the work could be completed.

One article on the Triassic-Jurassic Boundary, with an update of the proposal for St. Audries' Bay (SWEngland), was not available for inclusion in Newsletter 34/1 of July 2007. This file is too large for inclusion in the "normal Newsletter" which will be Newsletter 34/2, so it will be published as *International Subcommission on Jurassic Stratigraphy Newsletter* 34/3.

ICS and IUGS

This past year has proved to be a difficult one for relations between ICS and IUGS, more precisely

between the respective Executives. There were two principle aspects of this. One concerned the status of the Quaternary. This was simply omitted from the 2004 Geological Time Scale book written by the Chairman and Secretary of ICS, with some members of ICS (but certainly not most), and others. However, there had been no discussion or vote within ICS on this question of the status of the Quaternary and strong (to put it mildly) reactions were caused within the Quaternary community and beyond. The second problem was that the GTS 2004 book had been published with the ICS and IUGS logos incorporated, implying that it represented official ICS and IUGS policy. Since the issue had not been discussed or approved by either ICS or IUGS, this could not be the case and the official ICS and IUGS logos should not have been incorporated. At one point the Executive of IUGS threatened to withhold funding for ICS (and therefore all the Subcommissions). The situation was resolved to some extent, enabling funding to be restored - but watch this space!!!

Email address. The observant among you will have noticed that my email address above is different. My original email address is with France Telecom and this is NICOL.MORTON@wanadoo.fr (I never understood why it was put in capitals!). Some years ago France Telecom bought Orange and decided to use the Orange name for all their mobile phone and internet business, but informed us that the wanadoo.fr address could continue to be used. Recently they advised us to transfer to the orange.fr address but indicated that all mail to the wanadoo.fr address would continue to be delivered. So, at present both addresses work fine and can be used, but for the future it would be preferable to change to nicol.morton@orange.fr (now changed to lower case).

NEWS ITEMS & MEETINGS

REPORT ON 7TH INTERNATIONAL CONGRESS ON THE JURASSIC SYSTEM, KRAKOW, SEPTEMBER 2006

Andrzej WIERZBOWSKI, Chairman of Organising Committee

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This was the first Jurassic Congress/Symposium for which the place was chosen by participants of the previous Symposium, by vote after presentations of the candidates. In the same way it was decided during this Congress that the next one, the 8th International Congress on the Jurassic System, will be held in towns Suining and Shekong in Sichuan Province, southern China, in August 2010.

The 7th International Congress on the Jurassic System was held in Krakow, a magnificent medieval town and former capital of Poland. It is a scientific and cultural centre recognized by UNESCO as a gem of world's cultural heritage. The Congress was arranged by collaboration of the geological departments and institutes of Poland - University of Warsaw, AGH University of Science and Technology in Krakow, Polish Geological Institute, Polish Academy of Sciences, Jagellonian University in Krakow, University of Silesia, Polish Oil and Gas Company and others. The Organizing Committee included representatives from

most centres: A. Wierzbowski and B.A. Matyja (Faculty of Geology, University of Warsaw); J. Golonka and M. Krobicki (Faculty of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology); J. Gutowski and G. Pienkowski (Polish Geological Institute); M. Lewandowski (Institute of Geological Sciences, Polish Academy of Science); A. Uchman (Institute of Geological Sciences, Jagellonian University); A. Boczarowski (Faculty of Natural Sciences, University of Silesia); J. Zacharski (Polish Oil and Gas Company). The Committee also included R. Aubrecht from Slovakia (Faculty of Natural Sciences, Comenius University in Bratislava) giving the Congress a really international character. The Congress Secretaries were M. Barski and M. Sidorczuk and the scientific programme was arranged by E. Glowniak (all Faculty of Geology, University of Warsaw).

A total of 195 participants from 29 countries and six continents took part in the Congress. The Congress sessions were held in the main building of AGH University of Science and Technology in Krakow. The presentations of 133 talks and 93 posters were organised in nine scientific sessions (two of which were meetings of IGCP projects):

- (1) Geodynamics and evolution of different areas (convenors F.T. Fürsich, and J. Kutek);
- (2) Facies analysis and reconstruction of palaeoenvironments (convenor N. Morton);
- (3) Palaeoecology, palaeobiogeography (convenor A.Hallam);
- (4) Integrated stratigraphy (convenors J. Callomon, S. Elmi, R. Enay, H.C. Jenkyns, G. Pavia, P. Smith);
- (5) Jurassic organism in space and time (convenor F. Cecca);
- (6) Geoconservation and palaeontological heritage (convenor K. Page);
- (7) Organic geochemistry (convenor J. Golonka);
- (8) IGCP 506: Marine and non-marine Jurassic: global correlation and major geological events (convenor J. Sha);
- (9) IGCP 458: Triassic/Jurassic boundary events (convenors S. Hesselbo, J. Palfy, G. Warrington).

The abstracts of all the presentations have been published in *Volumina Jurassica* vol.4, a new geological journal directed towards problems of the Jurassic System. During the Congress a special presentation of the Oxfordian ammonites of the 19th century collection of the Physiographic Commission, described by J. Siemiradzki (1893), and housed in the Museum of the Institute of Geological Sciences of the Polish Academy of Sciences, was presented by E. Glowniak and her revision of the collection, especially prepared for the Congress will be published in a forthcoming issue of *Volumina Jurassica*.

A varied Congress social programme was arranged by M. Krobicki and J. Zacharski. It included an icebreaker party in the Congress Centre of the Royal Castle on Wawel Hill (of Upper Oxfordian limestones), and the Conference Dinner organized in the underground scenery of the restaurant in the 900-year old Wieliczka Salt Mine (salt of Miocene Age). A special programme for accompanying persons visited places of interest in Kraków and its neighbouring areas.

Seven Working Groups of the Jurassic Subcommittee held meetings during the Jurassic Congress, and discussed the problems of the Stage boundaries and location of their GSSPs. The two proposals dealing with the lower boundaries of the Toarcian Stage and the Kimmeridgian Stage were published in the Congress Abstracts *Volumina Jurassica*, and together with other proposals especially for the Hettangian Stage, the Callovian Stage and the Oxfordian Stage were discussed during the Congress.

A varied field trip programme consisting of one pre-Symposium field trip (A), and four post-symposium field trips (B1, B2, B3, B4) was prepared. This was possible due to location of the Krakow close to interesting outcrops of Jurassic in southern Poland – in the Gory Swietokrzyskie (Holy Cross Mts), the Krakow-Czestochowa-Wielun Upland (Polish Jura) and in the Polish and Slovakian Carpathians. The field trip guidebook *Jurassic of Poland and adjacent Polish Carpathians* (235 pp) prepared for the Congress gives detailed descriptions of the most classical outcrops of Jurassic rocks, and their stratigraphical, sedimentological and palaeostructural interpretation. This book includes the results of many new studies, some presented for the first time during the Congress. Its publication was sponsored by the Ministry of the Environment of Poland, and edited by Polish Geological Institute (2006) (ref. ISBN 83-7372-909-7).

The pre-Congress field trip (A) “From Tethyan to platform facies” was led by J. Golonka and M. Krobicki and demonstrated the Pieniny Klippen Belt in Poland (a highly complex tectonic zone in the Carpathians), and then the classical Carpathian flysch of the Outer Carpathians. The field trip also visited the Krakow Upland with typical platform Jurassic deposits, mostly condensed Callovian deposits and overlying deposits of the sponge megafacies, both representing a deep neritic zone of the northern Tethyan shelf.

The post-Congress field-trips demonstrated the highly diverse deposits of the platform facies (field-trips B1, B2, B4), and of the Carpathians in both Poland and Slovakia (field-trip B3 organized jointly by Polish and Slovakian colleagues):

Field-trip B1 (Biostratigraphical framework from Bajocian to Oxfordian), led by A. Wierzbowski presented the biostratigraphical problems of Middle Jurassic (Bajocian to Callovian) and Oxfordian deposits rich in fossils in the Polish Jura Chain;

Field-trip B2 (Upper Jurassic shallow-water carbonate platform and open shelf facies), led by J. Gutowski and B.A. Matyja, focused mainly on sedimentological aspects of the progradation of a shallow marine carbonate platform over open shelf sponge facies (from Holy Cross Mts to Polish Jura Chain) during Oxfordian/early Kimmeridgian time;

Field-trip B4 (Lower Jurassic marginal-marine and continental deposits: sedimentation, sequences and ecosystems), led by G. Pienkowski, demonstrated the diverse sediments cropping out along the northern slopes of the Holy Cross Mts.;

Field-trip B3 (Inside Tethys), led by R. Aubrecht, M. Krobicki and A. Uchman demonstrated the Jurassic

deposits of different palaeogeographic units of the Inner Carpathians in Poland and north-western Slovakia.

About 35 manuscripts were submitted during the Congress. The proceedings of the 7th International Congress on the Jurassic System will be published in *Volumina Jurassica* during Autumn 2007 (currently in press).

Organization of the 7th International Congress on the Jurassic System would not have been possible without the generous support of several institutions, especially: International Subcommittee on Jurassic Stratigraphy, Ministry of Environment of Poland, Orlen Group, Polish Oil and Gas Company, Warsaw University Foundation. Other institutions supporting the Congress included Ojców National Park, Pieniny National Park, Tatry National Park, Baltow Jurassic Park, Archeological Museum and Reserve at Krzemionki, Lhoist S.A. Poland, “Jurajska” Natural Mineral Water. Radio and television publicity and patronage included programmes on TV Krakow, Academic Radio “Kampus” and Radio Krakow.

REPORT ON MEETING OF JURASSIC SUBCOMMISSION, KRAKOW, SEPTEMBER 2006

Nicol MORTON, Chairman
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An open meeting of the Jurassic Subcommittee was held just before the close of the 7th International Congress on the Jurassic System in Krakow, Poland, from 14.00 to 16.00 on Thursday 14th September 2006. All Congress participants were invited to attend and approximately 150 were able to do so.

1. Welcome. All were invited to participate in the discussions and reports; however, it was explained that voting for any formal decisions, with the exception of the location of the next Jurassic Congress, would be by postal or electronic means.

2. Reports. The Convenors of the Working Groups were invited to give a summary report on the Working Group meetings that had been held during the Congress, emphasising the main conclusions and outlining future plans. These have been updated to May/June 2007 in the reports for this ISJS Newsletter [34/2] so are not presented here.

3. Membership, 2008-2012. Membership of the Jurassic Subcommittee must be reviewed periodically. The Executive (Chairman, Vice-Chairman and Secretary) and Voting Members are appointed for a four-year term that begins and ends during an International Geological Congress; the current membership serve from the 32nd IGC in Florence 2004 until the 23rd IGC in Oslo in 2008. Voting Members may serve for a maximum of three terms, but the Executive may serve only two terms; there are no such formal restrictions or rules about Corresponding or Honorary Members. The new Executive, to serve for the 2008-2012 term, should be elected by the Voting Members approximately one year before the next IGC, with the exception of the Secretary who is nominated by the Chairman-elect.

For the first time it was proposed and approved that a Nominating Committee be formed, consisting of Paul SMITH (Chair), Jim OGG and Giulio PAVIA, to propose candidates for election to Chairman and Vice-Chairman. The Committee would solicit suggestions from all members of the Jurassic Subcommittee and propose to the Subcommittee Chairman candidates for election by the Voting Members. The Chairman-elect would then consult with the Vice-Chairman-elect, the current Chairman and others over the nomination of the Secretary-elect. [See report in this Newsletter for results.]

At a later stage the Voting membership of the Subcommittee should be reviewed by the Chairman-elect and current Chairman, to establish which members were due to retire after serving three terms or who wished to retire. New Voting Members would be nominated to join the continuing Voting Members to maintain the number at 20 (in addition to the Executive).

4. 33rd IGC, Oslo 2008. The Jurassic Subcommittee had responded to an invitation to participate in the 32nd IGC in Florence in 2004 by organising the General Symposium G22-07 on The Jurassic World (Outside the Park). Opinion was sought over the possibility of participating in a similar way in the 33rd IGC in Oslo, 2008. There was little or no support for this so no proposal will be made.

5. 8th International Congress on the Jurassic System.

(a) Location. During the Subcommittee open meeting towards the end of the 6th Jurassic Congress in Sicily 2002 presentations were made in support of the four invitations for the 7th Jurassic Congress. These were discussed and in an open vote the invitation from Poland was accepted.

A similar request for invitations for the 8th Jurassic Congress, to be held (presumably) in 2010, was circulated some time before the meeting in Krakow. Two invitations were received, from China (Jingeng SHA) and India (Jai KRISHNA). Both prepared posters that were displayed during the Congress and during the Subcommittee meeting made brief presentations followed by questions. There was then an open discussion with the presenters absent.

A pre-Congress consultative vote had been arranged electronically. This indicated significant support for both invitations, with a small majority in favour of China. However, most of those who participated were present, so no details were given to the meeting. All those attending the meeting were invited to vote for their preference by show of hands. The result was:

In favour of China	58 votes
In favour of India	11 votes

[No count of abstentions was made.]

It was therefore declared that the invitation from China be accepted, so that the 8th International Congress on the Jurassic System will be held in China in 2010.

(b) Preferred dates. In the period before the Krakow Congress it became clear that the traditional September

dates [exceptions include Vancouver in 1998 (August, to avoid possible snow in the mountains) and Mendoza in 1994 (October, to reflect Southern Hemisphere situation)] for holding the Congress were no longer suitable for a number of potential participants; a discussion on the possibility of identifying more suitable dates was initiated. The result was not unanimous but there seemed to be more support for dates in August. It was pointed out that the organisers of the next Congress could not be bound by this preference because there may be very good reasons for different dates being proposed after the planning process was started.

6. Any other Business.

(a) Members' addresses. The Chairman asked that all members keep the Chairman and Secretary informed of any changes of address, including especially email address. Almost all communications are by email so that if such information is not forwarded, loss of communication will result.

(b) Distribution of Newsletters etc. The Newsletter is the principle means of communication between the Subcommittee and all those with an interest in the geology of the Jurassic. It is therefore vital that ALL members (Voting and Corresponding Members) should forward the Newsletter to anyone in their area, region or country (as appropriate). This is much easier now that the Newsletters are circulated in electronic form; it is a simple task to compile a mailing list and forward the Newsletter as an email attachment.

(c) Communication. The Newsletter is also the principle means of communication between individuals and the "rest of the world". It is open for contributions on any relevant topic, including details of important meetings, reports on research in progress, new research projects, requests for information or data; please also inform the Chairman and Secretary of the deaths of colleagues known to members of the Subcommittee.

7. Closure of the meeting. The meeting of the Subcommittee was formally closed and the Chairman thanked all present for their participation.

5th INTERNATIONAL SYMPOSIUM OF IGCP PROJECT 506, TUNISIA, 2008

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After the very successful workshops of Nanjing and Beijing (China; 2004, 2005), Krakow (Poland, 2006) and Bristol (UK, 2007), the UNESCO-IUGS International Geoscience Programme Project 506 will organize its fifth Symposium in Tunisia on March 28th-31st, 2008.

Organizing institutions The Faculty of Sciences of Bizerte and the Faculty of Sciences of Tunis, with the collaboration of the Tunisian Association of International Studies of Geology (ATEIG), the Tunisia Society of Natural Sciences (SSNT, North section), the Higher Institute of Arts and Crafts (ISAMS), the

National Office of Mines (ONM) and the Tunisian Enterprise of Petroleum Activities (ETAP), are pleased to contribute in maintaining the excellence that characterized IGCP 506 workshops and in strengthening the good relationships among the family of Jurassic workers. So, welcome to Tunisia, the country of beautiful geology and history.

The fifth Symposium of IGCP 506 will be held in Hammamet. Direct flights to and from Tunis are available for several European cities. Transportation from Tunis Carthage Airport to Hammamet is assured. Located about 60 km to the south of Tunis and 120 km to the south-east of Bizerte, Hammamet is one of the beautiful cities of Northern Tunisia and is referred to as the Cap Bon Peninsula "Queen of Cities". The scientific sessions are scheduled to take place at the Hammamet Club.

Symposium Topics The Symposium will be transacted in the English language. Abstracts, which should also be written in English and consist of 500 words maximum, are invited on any topic related to the Jurassic System.

Opening Conference Economic potential of the Jurassic Petroleum Systems of North Africa and the Middle East.

Plenary Sessions (Keynote talks)

1. Jurassic stratigraphic correlations: recent data, problems and alternatives;
2. Jurassic of North Africa: Major Events and Correlations;
3. The Jurassic-Cretaceous Boundary on the Maghrebian Margin;
4. Jurassic sequence stratigraphy of the Tethyan Margins: a comparative analysis.

Oral Communications and Posters

Strato-boundaries (T-J, J-K) and correlations; multidisciplinary approaches; Integrated stratigraphy; Sedimentology and palaeogeography; Isotope Geology, chemo- and magnetostratigraphy; Biodiversity changes, palaeoecology and palaeobiogeography; Major Geological Events (geodynamics, sea level changes, climate): potential causes and controlling factors; Geophysics and subsurface analysis; Natural resources and economic potential.

Field trips The main topic is 'Marine and Non-marine Jurassic of Tunisia: The State of the Art'. Two parallel field trips of two days each are planned, with the purpose of providing participants with an overview of the facies and stratigraphy of the Jurassic of Tunisia

A. Southern Tunisia trip (two days)

Jurassic successions representing a broad range of depositional environments (evaporitic and siliciclastic fluviodeltaic predominating facies). Carbonates and associate reefs related to major transgressive events. The T/J and the J/K transitions. A visit to the K/T limit of the Kef section is also planned.

B. Central and Northern Tunisia trip

Outer shelf, slope-to-basin deposits (J. Zaghouan and J. Oust) and deep-water biosiliceous radiolarian-bearing

facies (J. Jedidi and Mejez el Bebb sections). The J/K Boundary facies of the ammonite-and-calpionellid-bearing Sidi Khalif formation in J. Rhéouis (Upper Tithonian-Lower Berriasian) and J. Sidi Khalif (Lower-Middle Berriasian). T/J limit, condensed sections and ironstones of the North South Axis (NOSA).

Symposium Fees (Fees may change slightly according to the number of participants); 1 Euro =1,73 Tunisian Dinars (TND); 1US Dollar= 1,2 TND
Registration fees: 65 covers Symposium bag with abstract volume and field trip guide-books, icebreaker, tea/coffee (reduced tariff for students: 45).
Field trip costs: Southern Tunisia: 60 ; Central and Northern Tunisia: 50 (reduced tariffs for students: 40 and 35 , respectively).
Accommodation (Hammamet Club): 35 per person per night (all inclusive)

Preliminary Registration

Family name:
 First Name(s):
 University/Institution:
 Function:
 Address:

Tel. Fax.
 Email.
 Intending to present
 talk YES/NO
 poster YES/NO
 provisional title(s)

Accompanying person
 Email registration to igcp08@gmail.com
 [Or fax to one of contacts below]

More details and registration card download are available at www.northafrica.de/conferences.htm

Deadlines Preliminary registration: November 30th, 2007; Abstracts: January 30th, 2008

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CABO MONDEGO IS NATIONAL NATURAL MONUMENT

Maria Helena HENRIQUES
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It is my pleasure to announce to you that Cabo Mondego cliffs (the whole coast from Upper Toarcian to Tithonian levels) are all classified as a Natural Monument of Portugal since last 6th June, by the Portuguese Government Resolution n^o9, as you can see at the Government official site. It is now assigned to Jurassic research only.

**JURASSIC SUBCOMMISSION EXECUTIVE
FOR 2008-2012**

Nicol MORTON
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Chairman: Jozsef PALFY, Museum of Natural History, Budapest, Hungary.

Vice-Chairman: Jingeng SHA, Nanjing Institute of Geology and Palaeontology, China.

Secretary: Stephen P. HESSELBO, University of Oxford, UK.

Selection procedures:

During the Jurassic Subcommission open meeting held at the end of the 7th International Congress on the Jurassic System in Krakow, Poland in September 2006, it was decided that a Nominations Committee should be established. The members were Paul L. SMITH (Canada), Vice-Chairman of the Jurassic Subcommission (retiring in 2008), James OGG (USA), Secretary General of the International Commission on Stratigraphy, and Giulio PAVIA (Italy), former Chairman of the Jurassic Subcommission. It was explained to the meeting that suggested names for nomination were invited and should be sent to the Chairman of the Nominations Committee. This was later confirmed by email messages from Paul SMITH to all Voting and Corresponding Members of the Jurassic Subcommission.

Several names were suggested to the Committee by members of the Subcommission and they also had a briefing document from me on the role of the Subcommission and of the Chairman, with my thoughts for the future. After careful consideration of all the suggestions, the unanimous decision of the Committee was to propose one outstanding candidate as Chairman, Jozsef PALFY. In accordance with the Constitution, the Vice-Chairman should, preferably, be resident in a different continent from the Chairman. Two candidates were selected for proposal as Vice-Chairman, but one declined the invitation after consideration, leaving one proposal, that of Jingeng SHA. The Committee's proposals were sent to the Subcommission Chairman who conducted by email a ballot of the Voting Members, who received a ballot form, personal statements by the nominees and my briefing document. The same documents were also sent to all Corresponding Members for their information (with the reminder that they were not technically entitled to vote, but with an invitation to send their views).

The proposed nominees were approved by the Voting Members (and supported by all the Corresponding Members who responded). The election of Jozsef PALFY as Chairman (with 100% of votes cast) and of Jingeng SHA as Vice-Chairman (with 90% of votes cast) were confirmed by email to all members of the Jurassic Subcommission, to the Chairman of the International Commission on Stratigraphy and to the President of IUGS.

After consultations with the Subcommission Chairman and the Vice-Chairman-elect, the Chairman-elect

nominated the Secretary, in accordance with the normal procedure and the Constitution.

I would like to take this opportunity to personally congratulate all three on their appointments (which are still to be ratified by the IUGS Executive). They will assume office after the 33rd International Geological Congress in August 2008, and serve for four years until the 34th International Geological Congress in 2012. All will be eligible for re-election at that time. The Jurassic Subcommission will be well served by this team.

REPORTS OF WORKING GROUPS

PLIENSBACHIAN WORKING GROUP

Christian MEISTER, Convenor
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The GSSP for the base of the Pliensbachian Stage (Wine Haven, Yorkshire, UK) has been published in *Episodes* (Meister *et al.*, June 2006), the official journal of the IUGS.

Following the objectives and the recommendations of the Jurassic Subcommission the next step is to standardize and propose a GSSP for the Substages (Lower - Upper Pliensbachian). The Lower-Upper Pliensbachian boundary is quite well known in Euroboreal, Western Tethys and Pacific areas:

(i) **NW Europe.** Several localities are of great interest for this boundary: certainly Yorkshire (UK), the Causses Basin (France) (Fig. 1) and Dorset (UK) probably provide good outcrops, but other candidates are possible, for example in Germany, Spain (Ibericas) or Portugal. The boundary is well determined with ammonites: it is the association of an endemic Harpoceratinae [*P. (Matteiceras) occidentale* Dommergues] and an Amaltheidae [*Amaltheus bifurcus* Howarth]. Other fossil groups also give good information on this boundary (Fig. 2).

(ii) **Western Tethys.** At least two localities have good potential: the Burano section in the Apennines, Central Italy (Fig. 3) and La Cerradura section in the Subbeticas, Spain (Fig. 5). The boundary can be determined with ammonites of the Harpoceratinae subfamily with the occurrence of *Fuciniceras* gr. *lavinianum* (Fucini) – *portisi* (Fucini). However, in this case clarification and consensus on the systematic position of *F. ambiguum* (Fucini) = *F. portisi* (Fucini), *F. gr. lavinianum* (Fucini) – *portisi* (Fucini) must be established. The occurrence of a Dactyloceratidae [*Cetonoceras psiloceroides* (Fucini)] is a good complement to determine the boundary.

(iii) **Pacific area.** Here some Dubariceratidae, *Fanninoceras leptodiscus* (Behrendsen) for South America (Fig. 5) and *Fanninoceras fannini* McLearn for North America (Fig. 6) may play a important role for recognising the base of the Upper Pliensbachian.

Even if the biostratigraphy based on ammonites seems to be quite precise in all these different paleogeographical domains (Fig. 7 and 8), once again the main problem will be the strong provincialism and consequently correlation between the different regions.

Now we must as a first step:

- 1) Establish proposals for the GSSP;
- 2) Select and have a consensus for some key areas;
- 3) Investigate and improve documentation in these places (magnetostratigraphy, isotope stratigraphy, biostratigraphy).

This first attempt is a basis for discussion. Comments from Members of the Working Group or other interested persons are very welcome and proposals for meetings in one or several localities to complete the data are also expected.

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Fig. 3. The Lower-Upper Pliensbachian boundary in western Tethys exemplified by the the Burano section in the Apennines, Italy.

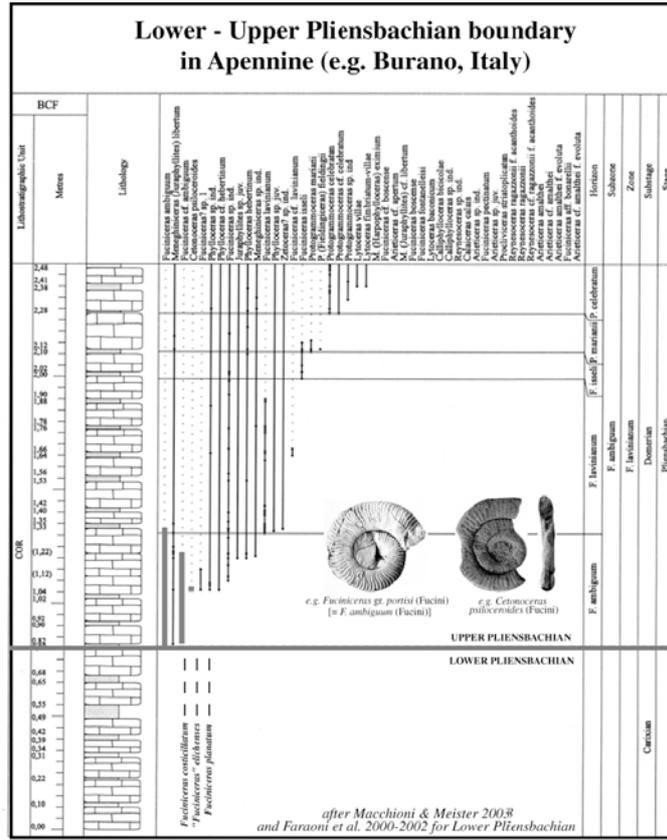


Fig. 4. The Lower-Upper Pliensbachian boundary in western Tethys exemplified by the the La Cerradura section in the Subbeticas, Spain.

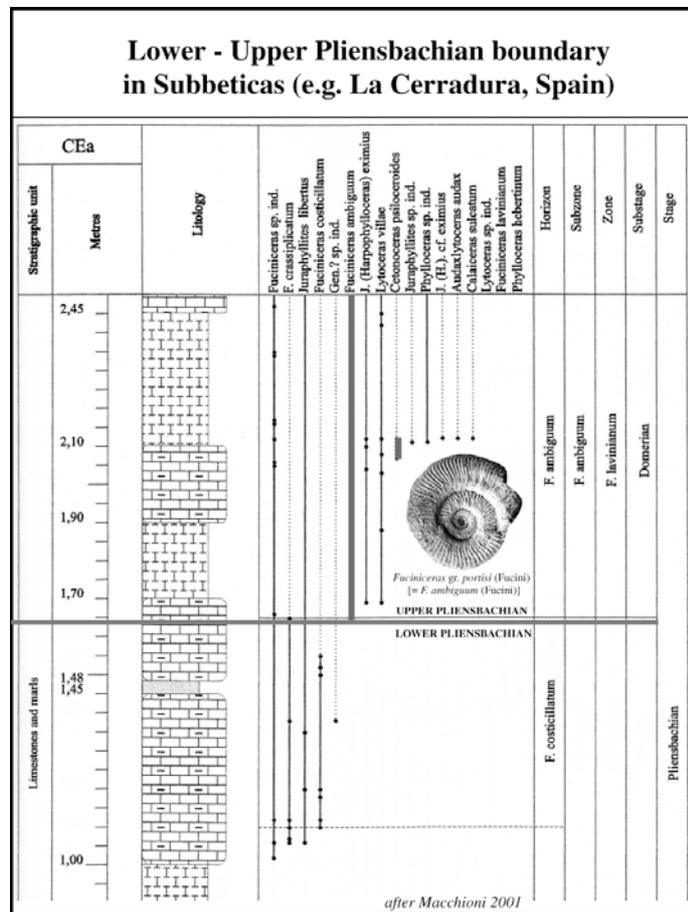


Fig. 5. The Lower-Upper Pliensbachian boundary in South America exemplified by the South Rio Transito section in Chili.

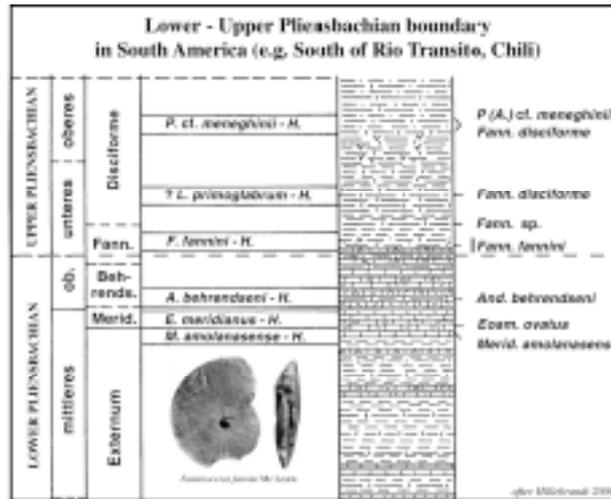


Fig. 6. The Lower-Upper Pliensbachian boundary in North America exemplified by the Queen Charlotte Islands in Canada.

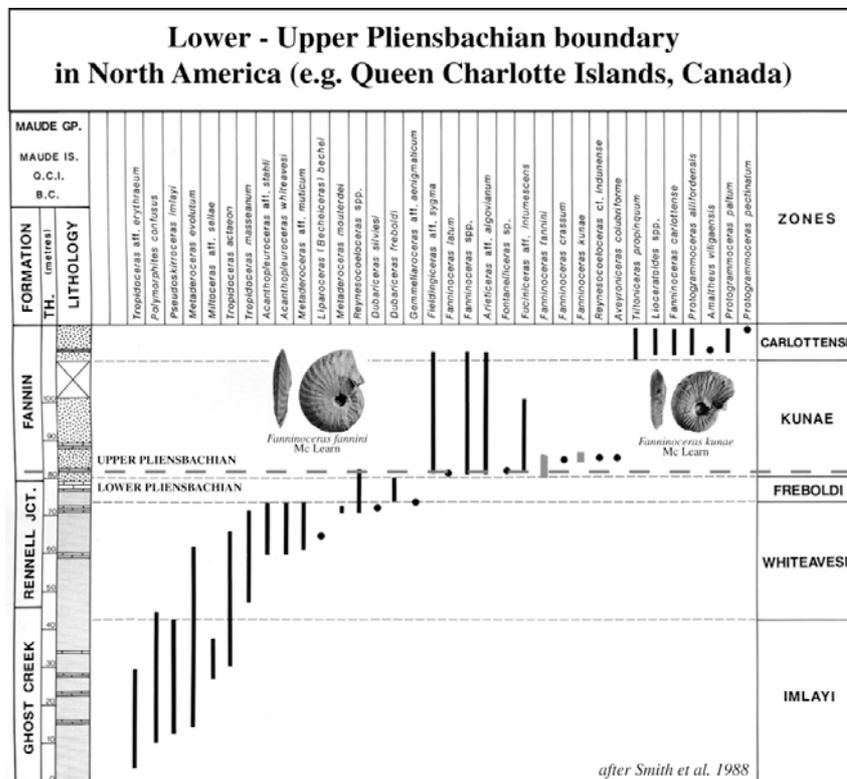


Fig. 7. Proposed correlation between the NW Europe standard zonation and the Apennines, Subbeticas and Upper Austroalpine units (Bakony and Austrian Alps) zonations at the Lower-Upper Pliensbachian boundary. C = *Cetoniceras psiloceroides* (Fucini) occurrence.

Substag.	NW Europe			Apennines		Subbeticas	Bakony	Austrian Alps
	Zones	Sub-zones	Horizons	Horizons Farauti et al. 2002	Horizons Ferretti & Meister 1994	Horizons Macchioni & Meister 2003	Upper austroalpine Horizons Meister 1995 Geczy & Meister 1998, in press	Upper austroalpine Horizons Blau & Meister 1991 Meister & Böhm 1993, Dommergues et al. 1995 Meister & Fricke 2003
Up. Pliens.	Margari-tatus	Stokesi	Celebratum Nitescens Monestieri Occidentale	? F. celebratum F. isseli F. brevispiratum F. lavinianum F. portisi	F. celebratum F. marianii F. isseli F. lavinianum- portisi	F. celebratum F. marianii F. isseli F. lavinianum F. portisi	F. celebratum F. marianii F. isseli-brevispiratum F. lavinianum- portisi	F. celebratum F. marianii M. nitescens M. monestieri F. lavinianum
Low. Pliensbachian	Davoeci	Figulinum Angulatum Crescens Capricornus Lataecosta Maculatum Sparsicosta	F. costicillatum R. simulans	 F. volatile sensu Ferretti	 F. costicillatum	F. "dilectum" sensu Braga	F. costicillatum-detractum A. crescens A. capricornus A. lataecosta A. maculatum F. volatile-pantaneli	 A. capricornus A. lataecosta A. maculatum A. sparsicosta

Fig. 8. Proposed correlation between the NW Europe standard zonation and western Tethyan and American zonations at the Lower-Upper Pliensbachian boundary. The dotted line suggests the correlation between the Lower and Upper Pliensbachian between Europe and America.

NORTH AMERICA		SOUTH AMERICA		NW EUROPE			WESTERN TETHYS		
Zones	Zones	Horizons	Zones	Sub-zones	Horizons	Bioevents	Zones Ap.	Zones Be.	
F. kumaie (pars)	F. fannini (pars)	<i>F. fannini</i>	Margaritatus	Stokesi	Celebratum	<i>F. celebratum</i>	F. lavinianum	F. lavinianum	
		<i>F. leptodiscus</i>			Nitescens	<i>F. marianii</i>			
		Monestieri	<i>F. Eisseli</i>						
		Occidentale	<i>F. lavinianum</i>						
D. freboldi	A. behrendseni	<i>A. behrendseni</i>	Davoei	Figulinum	Figulinum	<i>F. costicillatum</i>	E. costicillatum = F. dilectum sensu Braga	B. columbriforme = F. dilectum sensu Braga	
		<i>A. carinatus</i>			Angulatum				
		<i>A. prorsiflexus</i>		Crescens					
	<i>A. volkheimeri</i>	Capricornus							
	E. meridianus	<i>E. arayaensis</i>		Lataecosta					
		<i>E. ovatooides</i>		Maculatum					
<i>E. multicostatus</i>		Sparsicosta							
M. ex-terminum (pars)	D. latidorsale	<i>E. meridianus</i>	Ibex (pars)	Luridum	Luridum	<i>F. volubile</i>			
					Crassum	<i>F. dilectum</i>			
A. whitea-vesi (pars)					Rotundum	<i>F. aff. dilectum</i>			

BATHONIAN WORKING GROUP

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The Working Group meeting during the 7th International Jurassic Congress in Krakow agreed to submission of the proposal of the Ravin du Bès section as GSSP for vote in the Working Group by April 2007 and to the Jurassic Subcommittee later. New multidisciplinary investigations of the candidate section, however, have been finished during April and May. The formal ballot on the proposal of the Ravin du Bès section as GSSP for the Bathonian Stage, by post or email, to all members of the BtWG is responsibility of the convenor and the International Subcommittee on Jurassic Stratigraphy Executive, and is expected by September 2007.

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Callovian Working Group

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It is our firm resolve formally to complete the proposal and procedures for ratification by the ICS of the GSSP for the base of the Callovian Stage this year. It is a matter of regret that it should have taken so long, but some of the reasons (and excuses) may become apparent from what follows.

Historical. In short, the scientific arguments were completed in 1990 and a unanimous decision was reached by a properly constituted Working Group at a meeting called for this purpose in Stuttgart. This was in the days of the ICS *Guidelines* Version I (1986) and to satisfy their requirements in full would have called for considerable extra time and effort, for little apparent

scientific gain - at least, in the eyes of the Working Group. There seemed to be no great problems elsewhere awaiting a formal declaration of a Callovian Stage GSSP, no uncertainties dependent on it clamouring for a decision. The reason was simple. The chronostratigraphical level chosen for the base of the Callovian was little changed from where it had been since Opper's time over a century before and where everyone had always taken it to be. We in the Jurassic seemed to be getting along very well without Stage GSSPs as conceived and demanded by the ICS, again for reasons well understood in the Jurassic community but, it seems, less so by the members of the ICS. There tended hence to be always other things more urgently in need of attention. The history of events was as follows.

(1) *Stuttgart 1990*. - The deliberations and decisions reached at the meeting of the Callovian Working-Group held at Stuttgart and the proposed type section across the Bathonian-Callovian Boundary near Albstadt-Pfeffingen in the Swabian Alb were described quite fully in a Report circulated among the members of the WG and available on request. A summary of the meeting, its proceedings and the decision reached was published in *ISJS Newsletter* 20 (Callomon 1991, p.5). The stratotype section was chosen to lie in a section near Albstadt-Pfeffingen. The boundary was chosen on the basis of the biostratigraphy of the ammonite family Kosmocerasatidae, whose widespread distribution and rapid evolution makes possible geological time-correlations at this level over distances with a precision having no rivals. Such correlation-potential was taken to be the factor of dominant importance. Additional constraints required the boundary to lie at the base of the standard chronostratigraphical hierarchy of subdivisions, that of the lowest Subzone of the lowest Zone of the Stage - a concept also traditional in the Jurassic since Opper (and finding no mention in the *Guidelines*). The level finally adopted was the base of a thin bed marking the biohorizon of *Kepplerites keppleri* at the base of the Keppleri Subzone of the Herveyi Zone of the Callovian Stage. The scientific basis for these choices had been presented in some detail in the Proceedings of the 2nd Colloquium on the Jurassic held in Lisbon in 1987 (Callomon, Dietl & Page 1989). All the scientific evidence was therefore publicly available.

These principles were well understood by all 18 members of the Working-Group, representatives of 11 countries. They also understood ammonites and their biostratigraphy as well as the correlation-potentials of other guide-fossils often used for time-correlations. No alternatives of comparable correlation-potential could be discerned and no alternative sections of comparable merit for the GSSP were proposed. The vote to adopt the proposals put forward at Stuttgart was unanimous, with no abstentions. No challenge on scientific grounds has ever been raised, either then or at any time since.

An objection was however raised on doctrinal grounds by a colleague (not a member of the Callovian WG) who protested that the proposal did not meet one of the critical requirements of the *Guidelines* (of 1986), namely that the stratotype should be chosen in a section that was "complete" and not "condensed". Neither he nor the *Guidelines* explained what is meant by these terms, nor

by what criteria one could assess them in any particular case. To judge from an example of uncondensed completeness that he cited as a guide, that of a section in the Lower Lias of northern Germany, one could only assume a rather naïve faith on his part in the intrinsically more 'complete' nature of successions in clay-facies compared with those in limonite-oolitic claystones. That definition of 'completeness' is critical. Any discussion of it is meaningless until a time-scale has been specified. This had already been clearly spelt out well before 1986 in two classical papers by Schindel (1980, 1982), of which at least the ICS should have been aware, and amplified by another by Sadler & Strauss (1990). A resolution analysis of some prototypical Jurassic successions was subsequently carried out by one of us (Callomon 1995) and the results were revealing - and highly relevant to the argument. The time-scale of relevance here is that of the precision of time-correlations across distances by means of the best clocks available, here the ammonites as guide-fossils. It is the time-interval between distinguishable ammonite biohorizons, of the order in the Jurassic of 100 ka. On this time-scale the succession across the Bathonian-Callovian at Pfeffingen is complete, as the extensive researches of the 1980s in Britain and Germany had gone to considerable trouble to show. Events on shorter time-scales, such as those of taphonomy or sedimentary parasequences are irrelevant for they have little correlation-potential.

This objection against the 1990 proposals was submitted directly to the (then) Chairman of the ISJS - not to the Convenors of the WG, who found out about it and what it was only indirectly. It did not take long to submit a counter-argument, but to little effect. The Convenors of the WG were informed by the ISJS (*Newsletter* 24, 1997, p.7) that the proposals adopted at Stuttgart were not acceptable, as not meeting the ICS requirements, and that the case would have to be reopened. (And this, despite the fact that the Stuttgart proposals not yet been ever formally submitted to the ISJS in the first place. A sudden loss of urgency is then perhaps understandable. More details of this episode are to be found in Callomon & Dietl (2000 - Vancouver volume, p.49).

(2) *Vancouver 1998*. - The proposals were revived and presented at the 5th Jurassic Colloquium in Vancouver in 1998, published in the volume of its proceedings (Callomon & Dietl, 2000). The arguments of 1990 remained essentially unchanged but were amplified somewhat in the light of developments during the previous decade. The basic principles, P1 - P5, of chronostratigraphy were spelt out yet again and the extent to which the now revised *Guidelines*, Version II (1996) matched them was discussed. In particular, the concepts of parallel primary and secondary standards - all of them global - were explicitly re-emphasized (going back to the 1st Jurassic Colloquium at Erlangen in 1984, Callomon 1985). The auxiliary reference sections espoused by the ICS are not the same thing. They are meant to amplify the stratigraphy of the succession around a standard boundary stratotype, of the beds below and above, not to provide alternatives to the standard, nor to provide alternative expressions of the Stage as a whole. Primary and secondary in contrast refer

to alternative parallel standards, the defining boundaries of each of which could then themselves be amplified by means of auxiliary reference sections. The account at Vancouver now also presented the preliminary results of a palaeogeomagnetic survey of the succession at Pfeffingen, based on measurements by Jim R. Ogg (Purdue), and of measurements of the strontium stable isotope-ratio in the region of the Bathonian-Callovian boundary (but not at Pfeffingen) as reported by John M. McArthur (London). There the arguments rest today. Nothing to our knowledge of scientific significance has happened since that calls for any substantive changes.

The account of 1998 at Vancouver did raise a new crop of objections - this time by the then Chairman of ICS himself, acting as reviewer of the manuscript of the paper prior to publication in the Proceedings. They led to some correspondence that it would perhaps now be unkind to revive. It revealed that he did not understand the hierarchical, tiered structure of our standard chronostratigraphical classification in general; how it is built up from the biostratigraphical characteristics of our chosen guide-fossils, the ammonites, in our primary standard chronostratigraphy in particular; and how the keys to such hierarchical classifications lie in their members at the lowest level in the hierarchy - not at some arbitrarily chosen higher level such as Stages. Even more strangely, he did not seem to see how the same principles apply in the analogous system of Linnéan classification used in zoological taxonomy, drawn in for comparison: that the scope of a genus was completely defined by the species it contained. In the event, the manuscript appeared in print unchanged.

The present. If there have been no calls for change in the boundary definition of the primary Subboreal Callovian standard itself, there have been interesting developments elsewhere arising in part from new field-work in regions in which the segregated bioprovincialism of the ammonites have made it necessary to set up independent secondary standard chronozonations. A recent comparative review of the standard chronozonations of the Middle Jurassic in the Boreal, Subboreal and Submediterranean Provinces of Europe may be found in Callomon (2003a):

(1) *The Submediterranean Province*. This was the first faunal province to be given an independent chronozonation in the Callovian, going back to the studies in western France by Cariou in the 1980s. His classification was found to be more widely applicable in regions with well-developed Callovian successions, in the Paris and Rhone Basins, Spain and Portugal. Correlation with the primary Subboreal standard was moderately satisfactory at most levels except at the base, which is marked by widespread disconformities or biostratigraphic gaps. The relation between the base of the Submediterranean and Subboreal Callovian Stages was therefore highly uncertain. This problem has now been solved by the discovery of a previously undescribed section near Niort, western France, through a fault-bounded synsedimentary trench showing a more complete succession, one bed in which has yielded *Kepplerites keppleri* (Balusseau, Branger & Cariou, to be described). The two standard Stages can therefore be given the same basal boundary and the same GSSP can serve to define both.

(2) *The Russian Platform.* - There has been a remarkable resurgence in activity in the Jurassic of the Russian Platform, and in the Volga Basin in particular, by our colleagues D.B. Gulyav, D.N. Kiselev, V.V. Mitta and M.A. Rogov. As we all know, a generation ago there was officially no marine Bathonian on the Russian Platform. The oldest post-Palaeozoic sediments were declared to be Callovian, beginning with the Zone of *Cadoceras elatmae*. Now, suddenly, pre-Callovian sediments with ammonites are being found all over the region. The closest affinities of most of these ammonites, moreover, are with those of the Arctic, as exemplified by those of East Greenland in particular. Typical *Arcticoceras* (*sic*) has been followed south as far as Saratov, which lies (today) at the same latitude as Kellaways in Wiltshire. Prominent among the faunas are the Kosmocerotidae - including at one level the undoubted *Keplerites kepleri*. Rarely has the discovery of one guide-fossil drawn such a decisive line across a stratigraphic succession. The ammonites above the *kepleri* horizon differ sufficiently from those of western Europe to justify the construction of another independent, Russian secondary standard chronozone and this is in progress. However, this can also share its base with that of the primary standard, at the horizon of *Keplerites kepleri*.

(3) *East Greenland.* The firm recognition of a long pre-Callovian succession of ammonite faunas in East Greenland goes back to 1959. A review of the state of knowledge some 30 years later (Callomon 1993) gave a list of 37 ammonite biohorizons below the top of the Callovian, of which at least the first 25 were of pre-Callovian age. None of these could be directly correlated with the primary standard NW European succession, least of all the lowest of them, that of *Cranocephalites borealis*. They were therefore made the basis of another independent secondary zonation collectively referred to as simply Boreal Bathonian. The *borealis* horizon has since been dated by roundabout faunal correlations and strontium isotope ratios in belemnites to lie at about the Lower-Upper Bajocian boundary. The position of the Bajocian-Bathonian boundary in East Greenland remains conjectural.

The succession over the range of faunas 18-35 is rich in Kosmocerotidae and these were therefore drawn on in attempts to locate the Bathonian-Callovian boundary. However, the study of the ammonites was preliminary and the most likely correlation seemed to be between fauna 26, that of *Kepp. traillensis* Donovan, and *Kepp. kepleri*. More recent studies by Vassily Mitta, aided by the new discoveries in Russia, suggest however that the correlation should lie slightly higher, at faunal horizon 30. Unfortunately, the quality of the material from Greenland at this level is poor, but a re-examination by one of us (JHC) supports Mitta's contention.

(4) *Other provinces.* Secondary standard zonations of varying qualities, depending on the circumstances, have been proposed also for other regions, notably those in the circum-Pacific, from Alaska through the North American Interior to the Andes and Indonesia, thence along the southern margins of the Neotethys through the Himalayas to western India, Madagascar and Ethiopia. The only comment that need be made here is that in the absence of *Keplerites* in the southern

palaeohemisphere, correlations with the primary GSSP have to be indirect. Here, as in other cases, the 'G' in GSSP should not be viewed as an indication of global correlation-potential. As a recognition of the fact that any time-plane defined by a Golden Spike is global (Callomon 2003b), its explicit mention in this context is redundant. PSSP, PrimarySSP, would be more to the point.

Action - It has been suggested that despite its legitimacy at the time (1990), *de facto* if not *de jure* *legis* ICS, the decision of the Callovian WG should perhaps be refreshed by another Callovian WG today. This presents a problem: who are its members? Because of the finality of the proceedings in 1990, there seems to have been no need for a subsequent formal meeting of the WG to deliberate on the problem of the GSSP, which we are told is the prime function of our WGs. An invitation some years ago to our readership to join the Callovian WG or to renew membership elicited one response. So the invitation is here repeated: if you wish to be a member of the Callovian WG, please let us know. More widely, if anyone has any comments or suggestions relating to the proposed submission to the ICS of an application for ratification of the previously agreed Callovian basal boundary GSSP, please send them in. But the basis for discussion has to be the proposal as outlined in Vancouver (Callomon & Dietl 2000).

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OXFORDIAN WORKING GROUP

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There is little to add to the report presented last year (OWG Report 2006) concerning the “state of the art” of the basal Oxfordian GSSP proposal. Of the four candidate sections presented and discussed by a quantitative evaluation - Redcliff Point (Dorset, UK), Savournon (Peyral, Provence, SE France), Thuoux (near Savournon) and Dubki (Russian Platform, Volga Region) - the first two candidates stand out as more favourable. There will be a vote to select one of them as Global Stratotype (GSSP) and presumably the other as Auxiliary Stratotype (the second candidate). The other two sections discussed would stand as future reference or supplementary sections for other regions or provinces.

The section of Redcliff Point appears to be the most advanced at the present moment, since a formal, multi-authored proposal has been submitted (Page *et al.*, 2006; Page *et al.*, *in litt.*) presented as two separate notes: a general one, including ammonite biostratigraphy, different fossil group range charts and multidisciplinary analyses, and a more specific one on ammonite successions and taxonomy (Meléndez *et al.*, 2006). The section of Peyral, at Savournon has followed a slower process but is now also under way, for presentation as a firm candidate. A formal candidateship proposal was first presented by Atrops & Meléndez (2003). At the present moment, after several field campaigns of sampling and study of ammonite sequences across the boundary made by François Atrops, Kevin Page and the convenor of the Group, a more complete proposal is being prepared, including a team of microfossil and other analysis specialists: Katerina Tessakova (Univ. Moscow) ostracods; Agnes Görög (Univ. Budapest) foraminifera; Silvia Gardin (Univ. Paris) nannoplankton; Annachiara Bartolini (Univ. Paris) isotope analyses and the early contribution (1994) supplied by Niels Poulsen (Geol Survey Denmark; Copenhagen) on palynomorph dinoflagellates. All these analyses have yield promising results and their publication is now under way under different shape, in preparation or in press (Meléndez *et*

al. 2007; *in litt.*, Tessakova *et al.*, *in litt.*, Atrops *et al.*, *in prep.*)

The present situation allows us to be somewhat optimistic that, by early Autumn this year (October 2007) definitive manuscripts of both proposals could be distributed to all OWG members, to initiate the voting process for the basal Oxfordian stage stratotype; a process that might be fulfilled by the end of the year 2007.

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KIMMERIDGIAN WORKING GROUP

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The first vote within the KWG on the base of the Kimmeridgian Stage at the turn of November/December 2006 resulted in recognition of the Subboreal base of the Kimmeridgian Stage (i.e. base of the Baylei Zone) as its primary standard. The question posed was: “Do you accept the Subboreal base of the Kimmeridgian Stage (the base of Baylei Zone) as the primary standard of the stage – i.e. the level at which the Global Stratotype Section and Point for the Kimmeridgian will be selected?”. The results of this vote were as follows (30 of 38 members of the W.G., i.e. 79% voted): **yes** – 20 votes (66.6%), **no** - 6 votes (20%), **abstain** – 3 votes (10%), no direct reply – 1 vote (3.3%). The decision of the Working Group has been confirmed by a vote in the

Jurassic Subcommittee arranged by the Chairman. This vote, however, did not resolve two questions: (1) Which section best fulfils the GSSP requirements? and (2) What faunal horizon should define the base of the Baylei Zone?

Two successive votes were arranged in April 2007 within the KWG to resolve these two questions. The first vote asked: "Do you accept the Flodigarry section at Staffin Bay of Skye (Scotland) as the Global Stratotype Section and Point for the base of the Kimmeridgian?". The results were as follows (27 of 38 members of the WG, i.e. 71% voted): **yes** – 21 votes (77.7%), **no** – 4 votes (14.8%), **abstain** – 2 votes (7.4%). **Following the results of the vote, the Flodigarry section at Staffin Bay of Skye has been accepted by the Kimmeridgian Working Group as the Global Stratotype Section and Point for the base of the Kimmeridgian.**

In relation to the results of this vote some comments may be given. The Flodigarry section at Staffin Bay of northern Skye, Scotland (Wierzbowski et al. 2006 accessible on web-site: www.voluminajurassica.org; Matyja et al. 2006) shows an expanded stratigraphical succession rich in ammonites of Subboreal and Boreal affinities and enables detailed chronostratigraphic correlation between the Subboreal and Boreal schemes of ammonite zones, subzones and horizons. Detailed study of the microfossils revealed an excellent dinoflagellate succession, and magnetostratigraphic, isotope stratigraphic (Sr, O, C) and, recently also (Selby 2007), radioisotopic data (Re-Os), have also been documented in the section. No other section in the Subboreal Realm has been as thoroughly studied. The Flodigarry section fulfils the criteria for definition as the Global Stratotype Section and Point (GSSP) for the base of the Kimmeridgian Stage. All the classical localities for the Kimmeridgian in the Dorset Coast sections of England have a stratigraphical gap at the Oxfordian/Kimmeridgian boundary. The most famous, in Ringstead Bay in Dorset shows a succession encompassing the Oxfordian/Kimmeridgian boundary beds, consisting of alternations of ammonite- and non ammonite-bearing strata (but almost only Subboreal ammonites), totalling a thickness of 7-8 m, and containing at least three non-sequences. Of other English sections, that at South Ferriby (South Humberside) lacks a complete description and the complementary data, and it indicates a stratigraphical gap at the Oxfordian/Kimmeridgian boundary (Wignall 1990); moreover, the conservation potential of the section is rather small as it is exposed in a deep pit which will be flooded when the work stops. These sections fail to satisfy many of the principal criteria of ICS for the ideal requirements of a GSSP (Remane et al. 1996), and thus they cannot be proposed as GSSP candidates for the base of Kimmeridgian. The other sections of the Subboreal Province include these in Normandy (France) that show, however, a marked stratigraphical gap at the Oxfordian/Kimmeridgian boundary embracing the lower part of the Baylei Zone (Hantzpergue 1989). The sections in northern Germany and northern Poland are also unsuitable for stratigraphical purposes, showing generally the interval in question developed in shallow-water facies with rather rare ammonites – moreover, the

most famous section of the area at Czarnogłowy (Zarnglaff) in western Pomerania is nowadays completely flooded.

The second vote, concerning selection of the faunal horizon defining the base of the Baylei Zone, has not been unequivocally resolved. The question was: "What is the ammonite horizon you accept as the lowest level of the Baylei Zone and the Kimmeridgian Stage: (a) *Pictonia densicostata*, (b) *Pictonia flodigarriensis*, (c) neither, (d) abstain. The results were as follows (27 of 38 members of the WG, i.e. 71% voted): ***Pictonia densicostata* horizon** - 10 votes (37%), ***Pictonia flodigarriensis* horizon** - 14 votes (51.9%), **abstain** – 2 votes (7.4%), **neither** – 1 vote (3.7%). Comments are given below.

There are potentially two levels at which the base of the Baylei Zone can be defined:

(a) the base of the *densicostata* horizon which corresponds to the base of the Baylei Zone as defined originally by Salfeld (1913) in the Dorset Coast;

(b) the base of the *flodigarriensis* horizon as established recently by Matyja et al. (2006) and Wierzbowski et al. (2006) in the Staffin Bay section of Skye.

Both these horizons can be distinguished in the Staffin Bay section, in the lower part of the *Densicostata* Subzone (= lower part of the Baylei Zone), with the *flodigarriensis* horizon lying directly below the *densicostata* horizon. The difference between the two levels in the Flodigarry section is about 2 m.

(i) *Flodigarriensis* horizon

The base of the *flodigarriensis* horizon is defined by the first appearance of the newly established species *Pictonia flodigarriensis* Matyja, Wierzbowski, Wright. This species is the oldest representative of the genus *Pictonia*, and appears together with the first microconch counterparts of *Pictonia* - *Prorasenia*. The base of the *flodigarriensis* horizon shows also the first appearance of Boreal small-sized *Amoeboceras* of the subgenus *Plasmatites* (so-called group of *A. bauhini*) – with the species *Plasmatites praebauhini* (Salfeld). Thus, the base of the *flodigarriensis* horizon is well defined both by Subboreal and Boreal ammonites and if treated as the base of the Subboreal Baylei Zone, there is a good correlation of the base of this zone with the base of the Boreal Bauhini Zone marked by appearance of *Plasmatites*.

(ii) *Densicostata* horizon

The base of the *densicostata* horizon is defined by the first appearance of the Subboreal species – *Pictonia densicostata* Buckman (M, no change in microconchs when compared with the underlying *flodigarriensis* horizon), and the Boreal species – *Amoeboceras* (*Plasmatites*) *bauhini* (Oppel) – as shown in the Staffin Bay section (Matyja et al. 2006). These ammonites are not the earliest forms of the two lineages, but represent somewhat more advanced representatives of the *Pictonia* lineage, and the *Plasmatites* lineage, respectively.

Whichever of the two proposed levels is selected to identify the base of the Baylei Zone, some problems of detailed correlation with the Submediterranean ammonite succession remain to be resolved, using mostly the Subboreal and Boreal ammonites found in the Submediterranean Succession in Poland and southern Germany, but possibly also in other countries (France, Russia). So far, according to available information, if the base of the Baylei Zone is placed at the base of the *flodigarriensis* horizon, some lower parts of the the Bimmamatum Subzone of the Submediterranean Succession correlate with the lowermost parts of the Bauhini and Baylei zones, i.e. with the lowermost Boreal-Subboreal Kimmeridgian (Matyja et al. 2006). If the base of the Baylei Zone is placed at the base of the *densicostata* horizon some lower parts of the Hauffianum Subzone and/or upper parts of the Bimmamatum Subzone correlate with the lowermost parts of the Bauhini and Baylei zones (see figures 1-2).

It should be remembered that the difficulties of correlation are partly related to the scarcity of Boreal/Subboreal ammonites, and also the generally poor knowledge of the Submediterranean ammonite faunas and their distribution in the upper part of the Hypselum Subzone (the *berrense* horizon), the Bimmamatum Subzone and lowermost part of the Hauffianum Subzone. Thus, independently of which option would be chosen, further studies of the ammonites in the Submediterranean successions from the Hypselum Subzone to the Bimmamatum Subzone, and lower part of the Hauffianum Subzone should be undertaken as soon as possible.

The comments sent to me after the inconclusive vote on the selection of faunal horizon defining the base of the Subboreal Baylei Zone have involved mostly the problems of the correlation potential of particular horizons including the biostratigraphy, chemostratigraphy, magnetostratigraphy, sequence stratigraphy and others. Fortunately, the completeness of the geological record shown in the Flodigarry section makes it possible to use all the correlation criteria irrespective of which option will be chosen. An argument often used in the discussion was that the *flodigarriensis* horizon cannot be recognised anywhere outside its type-locality (i.e. Staffin Bay, Skye). It seems, however, unsubstantiated because the horizon itself is well defined by an assemblage of Subboreal/Boreal ammonites (not only *Pictonia flodigarriensis*) having a wide distribution in the Boreal Province and recognized widely in the Arctic. Thus, the most important problem that appears now is to make clear the correlation of the Subboreal/Boreal faunal horizons in question with the Submediterranean succession to evaluate their global correlation potentials (it was possibly the reason that some members of the KWG coming from the Mediterranean countries did not vote at all). Undoubtedly, much better documentation in relation to these problems would help in resolving the dilemma of selection of faunal horizon, and this needs new results from further studies. It seems reasonable thus to leave the final vote for a time before new materials will become available and will be presented within the Kimmeridgian Working Group. Then, we can return to

the vote that will define the best level marking the base of the Baylei Zone, i.e. the base of the Kimmeridgian.

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TITHONIAN WORKING GROUP

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KI-TI BOUNDARY PROBLEMS

During the last Jurassic Congress in Krakow, there was a short meeting of the Working Group members who had attended the Congress. Some of the members, however, could not take part in this meeting due to overlapping meetings of other Working Groups. Therefore we here present the statements of the convenor made at this meeting, making clear the still serious problems in defining a boundary section:

Looking for a type section for the base of the Tithonian – big problem or BAD APPROACH?

The real, NATURAL situation:

There are no less than five or six eco-sedimentary contexts (areas, regions) and their corresponding ammonoid communities, probably far from the standard situation assumed for other Jurassic stages. Could a single section facilitate the precise correlation among the stratigraphical pattern of the record of these ammonoid communities? Most probably not, and this makes exigency of particular effort (both conceptual and empirical). Looking for correlation of separate communities or looking for correlation of on-lapping or punctually replacing communities? Only the second is relevant through identification of ecotonal areas or ecological turnover episodes.

Sound and forced approaches:

A sound approach implies: (i) identification (of section & ammonoids); (ii) analysis (of section & ammonoids); (iii) report/publication (of section and ammonoids); (iv) evaluation of correlation potential; and (v) proposal and discussion.

A forced approach implies: (i) potential identification (of section & ammonoids); (ii) potential analysis (of section & ammonoids); (iii) no report/publication (of section and ammonoids); (iv) forced, pre-supposed evaluation of correlation potential; and (v) proposal and discussion.

How to proceed with potential proposals based on sound approaches?

A hierarchical integrative information process can be applied:

- (i) To select among, or to combine, potential competitors from within the same ecosedimentary environment (area, region);
- (ii) To improve research in ecotonal or fringe areas where stratigraphical, community on-lapping is demonstrable.
- (iii) To identify the “optimal” section for indirect correlation among those of the immediately lower level in the hierarchical integrative information model.

The state of the art:

- (i) No precise biostratigraphy exists, published, from all (complete set) of the areas, regions involved.
- (ii) There exists a single sound proposal (Fornazzo near Castellamare in Western Sicily).
- (iii) There seems to exist a single forced proposal (Canjuer in SE France).
- (iv) There exists an invitation to accomplish points (iv) - evaluation of correlation potential - and (v) - proposal and discussion - stated above (Russian colleagues, 2007).

The near future:

2007: Russian step – M. Rogov and colleagues organised a Jurassic meeting in Moscow for June 20th - 27th, 2007, with field trips to the banks of the Volga and to the Saratov area.

2007-2008: Mediterranean progress (600 specimens of genus *Hybonotoceras* under study in a PhD Thesis at University of Granada).

Other inputs to be received.

PRESENTATIONS DURING 7TH JURASSIC CONGRESS

During the Jurassic Congress the following presentations dealt with the Kimmeridgian/Tithonian or Tithonian stratigraphy and faunas:

- MITTA, V. & SCHERZINGER, A. 2006: New data on ammonites and stratigraphy of the uppermost Kimmeridgian – lowermost Volgian of the Middle Volga region (Russia). *Volumina Jurassica*, **4**: 1191-192.
- PODOBINA, V., GABYSHEVA, E. & TATYANIN, G. 2006: The problem of establishing the Tithonian stage in Western Siberia. *Volumina Jurassica*, **4**: 205-206.
- ROGOV, M., SCHEPETOVA, E., USTINOVA, PRICE, G. D., GUZHIKOV, A., PIMENOV, M. & DZYUBA, O. 2006: A multi-proxy study of the Kimmeridgian/Volgian boundary beds in the Gorodischi section (Middle Volga area, Russia), the lectostratotype of the Volgian Stage. *Volumina Jurassica*, **4**: 208-210.
- SCHERZINGER, A., ATROPS, F. & SCHWEIGERT, G. 2006: New studies on perisphinctids from the Lower Tithonian (Hybonotum Zone) of S Germany and SE France. *Volumina Jurassica*, **4**: 244-245.
- SCHWEIGERT, G. & ATROPS, F. 2006: The base of the Tithonian Stage – historical review and state of the art. *Volumina Jurassica*, **4**: 213-214.
- VILLASEÑOR, A.B. & OLÓRIZ, F. 2006: Ontogeny in a macroconchiate *Idoceras* from Mexico: a key for interpreting suprageneric classification of genus *Idoceras* based on phenotype expression. *Volumina Jurassica*, **4**: 245-247.
- ZAKHAROV, V., ROGOV, M. & KISELEV, D. 2006: The Volgian Stage and Jurassic/Cretaceous boundary in the Panboreal Superrealm. *Volumina Jurassica*, **4**: 224-226.

New Literature

The references of new papers concerning the Ki/Ti boundary, Tithonian stratigraphy or containing information on these topics are listed below. These papers correspond only to those that have been communicated to the Convenor or to the Secretary.

- OLÓRIZ, F., BOUGHDIRI, M. & MARQUES, B. 2006: Remarks on relative phenotype stability in two Tithonian ammonite species first described from the Tunisian Dorsale. – *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **241**: 287-302, 4 figs.; Stuttgart.
- PARENT, H., SCHERZINGER, A. & SCHWEIGERT, G. 2006: The earliest ammonite faunas from the Andean Tithonian of the Neuquén-Mendoza Basin, Argentina – Chile. – *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **241**: 253-267, 7 figs.; Stuttgart.
- SCHERZINGER, A. & MITTA, V. 2006: New data on ammonites and stratigraphy of the Upper Kimmeridgian and Lower Volgian (Upper Jurassic) of the middle Volga Region (Russia). – *Neues Jahrbuch für Geologie und Paläontologie, ABHANDLUNGEN*, **241**: 225-251, 8 FIGS.; STUTTGART.
- SCHERZINGER, A., SCHWEIGERT, G. & PARENT, H. 2006: Considerations on dimorphism and aptychus in *Gravesia* Salfeld (Ammonoidea, Late Jurassic). – *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **241**: 269-286, 6 Abb.; Stuttgart.
- SCHWEIGERT, G. 2006: Kalibrierung des Oberen Jura der Stratigraphischen Tabelle Deutschlands 2002 mittels Faunenhorizonten. – *Newsletters on Stratigraphy*, **41**: 279-286, 1 table; Berlin & Stuttgart.
- VILLASEÑOR MARTÍNEZ, A. B. & OLÓRIZ SÁEZ, F. 2007: Ammonites endémicos caribeños del Tithoniano temprano en el centro-este de México. *3er Simposio Argentino Jurásico. Programa y Resúmenes*, p. 81. CRICYT, Mendoza, Argentina 2 al 5 de mayo 2007.

GEOCONSERVATION WORKING GROUP

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ISJS Kraków 2006: The 2006 Jurassic Symposium in Krakow provided an excellent opportunity for a number of the members of the Working Group to meet and discuss issues of common interest and concern. Session 6 of the Krakow meeting addressed Geoconservation and palaeontological heritage, the papers presented being:

- DELVENE, G., MELÉNDEZ, G. & MENÉNDEZ, S. 2006. Protecting the Jurassic invertebrate collections in the museums: the “Museo Geominero” (Geo-mining Museum, IGME, Spain). *Volumina Jurassica* **4**: 251.
- GLOWNIAK, E. & WIERZBOWSKI, A. 2006. Palaeontological heritage in the XIXth century and the Physiographic Commission of the Polish Academy of Arts and Sciences in Kraków: museum exhibit or scientific value. *Volumina Jurassica* **4**: 252.
- PAGE, K.N., MELÉNDEZ, G. & HENRIQUES, M.-H. 2006. Jurassic Global stratotype Section and Points (GSSPs) – a potential serial World Heritage Site? *Volumina Jurassica* **4**: 253.

PAGE, K.N. & WIMBLEDON, W.A. 2006. The conservation of Jurassic Heritage in the UK – a critical review of current practice and effectiveness. *Volumina Jurassica* **4**: 254.

Thanks to the kindness of Margorzeta Gonera of the Polish Academy of Sciences, who is working in Geoconservation in Poland, it was also possible to build an accessory Geoconservation theme into the excellent first excursion of the meeting.

Survey and legislative issues such as the compilation of inventories and establishing legal protection, combined with management issues such as the deterioration of exposures due to vegetation growth or tipping, loss due to construction activities or infill and fossil collecting issues were all apparent - as throughout Europe. The commonality of such issues emphasises both why a united European approach is both possible and indeed necessary if we are to safeguard our key scientific sites for future scientific and educational use. Some of these issues will be discussed at the forthcoming annual meeting of ProGEO – the European Association for the Conservation of the Geological Heritage – to be held in Slovenia in September 2007 (see the ProGEO website for details: www.sgn.se/hotell/progeo).

Fossil collecting in Scotland: Scotland’s geological heritage includes a number of globally important palaeontological sites, including the Rhynie Chert with its Devonian plants and arthropods, the famous fish of the Devonian Old Red Sandstone Orcadian Basin and the conodont animals of the Carboniferous Granton Shrimp Bed. Its Jurassic is no less important, however, and includes the Auxiliary Stratotype Point for the base of the Bajocian Stage at Bearraig Bay and the candidate GSSP for the base of the Kimmeridgian in Staffin Bay (both on the Isle of Skye).

The governmental nature conservation agency in Scotland, Scottish Natural Heritage (SNH), has a duty under the Nature Conservation (Scotland) Act 2004 to produce a code to guide anyone involved in the collection, owning and care of Scottish fossils and therefore help ensure their long term safeguard. The Code will comprise:

- An introduction to fossils, the fossil heritage of Scotland and the legalities of collecting.
- The provision of best practice and guidance in the collection and care of fossils.
- Further guidance for various specialist groups and others with a particular involvement with Scotland’s fossil heritage.
- Advice on donating fossil specimens to museums and general information on the role of museum and other public bodies in the care and maintenance of fossil collections.
- Sources of further information including the identification, collection and care of fossils.

SNH are very keen that anyone with an interest in the palaeontological heritage of Scotland, including both through direct field experience or simply through managing a collection containing Scottish material

should take part in a consultation on the contents of this Code. To view the consultation document and comment on line visit: www.snh.org.uk/fossilcode

Alternatively consultation can be carried out by post, copies of the document being obtainable from: Policy and Advice Administration Support, Scottish Natural Heritage, Great Glen House, Leachkin Road, Inverness IV3 8NW, Scotland. UNITED KINGDOM (telephone: 00-44-1463-725000)

Comments can also be emailed to:
fossil.consultation@snh.gov.uk

I would strongly urge anyone who has any experience of Scottish geology to take part in this consultation – this is a truly milestone event for palaeontological heritage conservation in the UK, the first genuinely open consultation on such a document to ever have been carried out. It is crucial, therefore, that Jurassic specialists make representation alongside those with Palaeozoic interests, to help ensure that Scotland's famous Mesozoic sites and that the material collected from them also remain available for future research and education.

But remember, the closing date for comments is **7th September 2007!**

LIAISON WORKING GROUP

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Once again I am able to report progress and expansion of the Working Group although we had the sad news of the deaths of two members and good friends from France. Serge Elmi was responsible for motivating me to look more closely at the nature of the variability at each level in the Toarcian-Aalenian Hammatoceratoidea and Henri Gauthier spent a great deal of his personal time answering questions for Volker Dietze and I on the genus *Garantiana*. Both scientists will be sadly missed.

Comparison between the faunas of the Aalenian-Bajocian of England and Bulgaria by Lubomir Metodiev and Ivan Sapunov has produced new and important information and I thank these workers for their continued cooperation with the Working Group.

My time recently has been mainly devoted to the construction and opening of a 'Fossil Gallery' in Sherborne Castle, Dorset, the area of the classical researches of William Smith and later S.S. Buckman. The success of the project has been due to the generosity of the Curry Fund of the Geologists' Association, Dorset County Council and Natural England. I would personally like to thank Helen Powell of Natural England, Ann Smith of Sherborne Castle and Richard Edmonds of Dorset County Council for their drive and enthusiasm in getting the project finished. The landowners and tenants, in particular the Digby family of Sherborne and the Loxton's who farm the land of Winchester College at Bradford Abbas have actively promoted the work and advance of geological science and have consented to rock excavation on their property with

a view to constructing a fine geological timescale based on ammonites.

On the 23rd April 2007, Hugh Torrens (a former Sherborne pupil) (Fig. 1) gave an account of the value of the area's geology and the contribution of the Buckman family and opened the display with an excellent speech and a glass of Sherborne Castle 'Champagne'. The specimens on display (Fig. 2) are donated or on permanent loan from the Sedgwick Museum. They are small selection of what has been found by the Wessex Cephalopod Club, principally John Callomon, Robert Chandler, Volker Dietze, Andrew England, Bill Jones, David Sole, and Lizzie and Eden Sutcliffe. This display marks 40 years of work on Dorset-Somerset geology by the group. The exhibit bears testimony to the contribution that can be made by landowners, professional scientists, amateurs and commercial collectors working in unison. The display will be updated regularly and links with local stone extraction on the Digby Estate and the area's relevance to the Jurassic Coast World Heritage Site will be highlighted.

Fig. 1. The opening of the Sherborne Castle fossil display: from left to right Edward Digby, Richard Edmonds, Hugh Torrens and Robert Chandler with *Teloceras* sp.



Fig. 2. One of the new showcases at Sherborne Castle, showing fossils from the area.



Finally you may wish to hear that Horn Park Quarry, Dorset UK has gained National Nature Reserve status

and plans are in place for its long- and short-term management.

For this report Liaison Group members have compiled number of important short contributions: Viv Stevens gives an update on the Portland Beds in Wiltshire; Armin Scherzinger deals with *Virgatixioceras* ARKELL; David Sole reports on the 'Fossil Collecting Code for West Dorset'; Richard Edmonds and Vincent May give an update on the Dorset and East Devon Coast World Heritage Site.

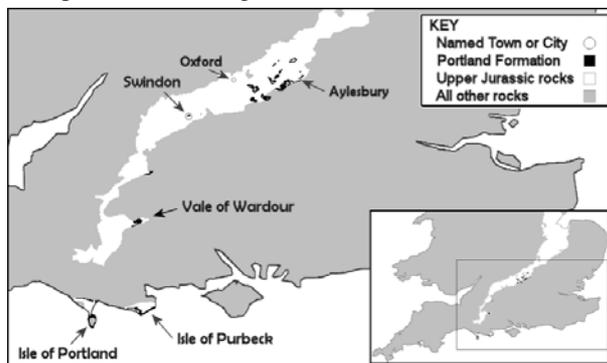
The Portlandian Group in Wiltshire, UK

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In the Vale of Wardour, west of Salisbury in central southern England, is the largest outcrop of the Portland Group in Wiltshire (Fig. 3). It is divided into the sandy Wardour Formation, and the overlying Portland Stone Formation, which is predominantly limestone. This quarry at Upper Chicks Grove has been worked for its building stone for several centuries; the fauna of the higher beds here was originally described by Etheldred Benett, the world's first lady geologist, and was figured in Sowerby's *The Mineral Conchology of Great Britain* (Volume 2; 1816). The building stones from this quarry are glauconitic bioclastic limestones and sandstones, and are extracted from the Tisbury Member of the Portland Group, belonging to the higher Glaucolithus, and lower Okusensis Zones.

Fig. 3. Distribution of main outcrops of the Portlandian Group in southern England.



The lowest beds visible in the quarry are those of the basal Tisbury Member (*sensu* Bristow 1999) of the Portland Stone Formation; they consist of pink and grey micrites of the Glaucolithus Zone of the Portlandian. The underlying Wardour Formation is not visible at Chicks Grove although its presence has been proved in boreholes at this location (Wimbleton 1976), and nearby, at Tisbury (Bristow *et al.* 1999).

Near the top of the Tisbury Member there is a discontinuity and an erosion surface upon which the Wockley Member (*sensu* Wimbleton 1976) rests. These beds are now included in the Tisbury Member (Bristow 1999) mainly on lithological grounds; they represent part of the Kerberus to basal Anguiformis Zones (Wimbleton & Cope 1978). In recent years they have produced detrital plant remains and animal fossils, which are the subject of continuing research.

The Vale of Wardour outcrop is important for several reasons. Geographically, it is placed between the well exposed Portland Group of Dorset, and the poorly exposed, fossiliferous, Portlandian of Swindon and the south-east Midlands. There are striking lithological differences between these areas, largely as a result of the trend of global sea-level fall during the late Bolonian and Portlandian Stages. The circumstances of deposition and diagenesis have also influenced the quality and quantity of the fossil material preserved; in Dorset, for example, the upper part of the West-Weare Sandstone Member (in which the Okusensis-Kerberus boundary lies) is dolomitised, and its fossils are poorly preserved. These beds correspond with the section near the top the Tisbury Member at Chicks Grove, and although fossils are not very common here (nor is preservation remarkable), the potential for material of biostratigraphic relevance is nevertheless significant.

As well as facies differences across southern England, the Portland Group within Wiltshire shows marked local differences at quite a small scale. For example, there is no discontinuity in the upper part of the Tisbury Member in a working quarry just 2 km to the north-east of Upper Chicks Grove; the building stones there are taken largely from the Chilmark Member, which seems to be a purely local development. Moreover, the Tisbury Member itself may be diachronous even across this small distance (Wimbleton 1976), although this is not certain.

Reorganisation and expansion of the quarry at Upper Chicks Grove has created the opportunity for a review of the stratigraphy, the collection of more fossil material, and for assigning new material to exact horizons; this work is continuing. It may be possible, for example, to refine the level of the base of the Okusensis Zone, or to tighten the biostratigraphic dating of the discontinuity near the top of the Tisbury Member.

Thanks are due to Professor John Cope, and Dr. W. Wimbleton for their help and encouragement. I am very grateful to Will Collins and his colleagues at the Upper Chicks Grove Quarry for their patience and for allowing access, without which this work would not be possible.

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**New studies on dimorphism and phylogeny in
Virgatixioceras Arkell (Ammonoidea; Late
Jurassic)**

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New and extensive collections from the Upper Kimmeridgian Beckeri Zone of some exposures in S Germany (Kolbingen, Grabenstetten, Möhringen a. d. Donau, Storzigen and Torleite), together with previously published material and information (Schlosser 1882, Schneid 1914 published 1916, Berckhemer 1922, Roll 1931, Berckhemer & Hölder 1959, Schweigert 1993, 1994), give deep insights into the ontogeny, intraspecific variation, dimorphism and evolution of the Late Jurassic perisphinctid ammonite genus *Virgatixioceras* ARKELL, as a basis for future revision. In older studies *Virgatixioceras* [M + m] was often problematic due to scarce material, erroneous interpretations of type species, incompletely or poorly preserved specimens, disregard of dimorphism and widespread homeomorphism.

Today we include the following perisphinctids in *Virgatixioceras* ARKELL:

Perisphinctes kelheimensis SCHLOSSER [M],
Perisphinctes diceratinus SCHLOSSER [m],
Virgatosphinctes setatus SCHNEID [m], *Virgatosphinctes supinus* SCHNEID [m], *Virgatosphinctes isolatus* SCHNEID [m], *Virgatosphinctes abbachensis* SCHNEID [M], *Perisphinctes albulus* QUENSTEDT [M] non BERCKHEMER & HÖLDER (1959, Pl. 10, Fig. 51), *Aulacosphinctes minutus* BERCKHEMER [m], *Perisphinctes praenuntians* sensu BERCKHEMER & HÖLDER non FONTANNES [m], *Perisphinctes uracensis* BERCKHEMER & HÖLDER [m], *Perisphinctes virgulatiformis* BERCKHEMER & HÖLDER [m], *Tolvericeras sevogodense* sensu SCHWEIGERT (1993, Fig. 6) [M] non CONTINI & HANTZPERGUE, *Virgatixioceras* n. sp. sensu SCHERZINGER & MITTA (2006: 235), *Virgatixioceras* (?) *sapunovi* ZEISS [M].

Virgalithacoceras tantalus sensu SCHWEIGERT (1994, Pl. 1, Fig. 1) [M], *Virgalithacoceras fruticans* sensu SCHWEIGERT (1994, Pl. 1, Fig. 2-4) [m] and *Virgatixioceras dividuum* sensu SCHWEIGERT (1994, Pl. 2, Fig. 1-4) non MESEZHNIKOV [M] are true *Virgatixioceras*. There is no relationship with *Sarmatisphinctes* KUTEK & ZEISS.

Virgatosphinctes comatus SCHNEID and *Virgatosphinctes subsetatus* SCHNEID are synonyms of *Virgatosphinctes setatus*. The systematic status of *Virgatixioceras* (?) *sapunovi* ZEISS and the precise stratigraphic position of some species are still unclear.

After recent studies in S. Germany it is found that the stratigraphical range is much longer than previously thought. *Virgatixioceras* s. str. appears in the early Subeumela Subzone and disappears in the early Ulmense Subzone, Zio-Wepferi Horizon, of the Beckeri Zone. Also there exist specimens from all the ammonite faunal horizons within this stratigraphical interval. The genus can also be recognized in SE France (Coll. F. ATROPS, Univ. Lyon), N Switzerland (unpublished), and Bulgaria (SAPUNOV 1979).

The different chronospecies show very high intraspecific variation, comparable with that of some subboreal ammonites. In some biohorizons, forms with bipartite ribbing dominate and at other levels forms with virgatipartite ribbing. All chronospecies belong to one single phylogenetic line. *Virgatixioceras* is very frequent in most biohorizons and the faunas are dominated by microconchs with lappets. The last descendants from the Ulmense Subzone and macroconchs are usually rare.

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**A hostile analysis of the West Dorset (UK)
fossil collecting code – was it justified?**

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The debate over the West Dorset fossil collecting code appears to have reached a new intensity, to judge by the analysis and accompanying comments in Newsletter 33 (Page 2006). For those interested in or indeed wishing to join the debate, I would like first to offer a more detailed account of the code than the very subjective summary provided there (p. 22-23), and follow this with a number of comments on the analysis.

Background to the code

The 15 kilometres of West Dorset's rapidly eroding coastline have long been a focus for collectors. The Lower Jurassic cliffs and foreshore adjoining the holiday resorts of Lyme Regis and Charmouth, in particular, are famous for their plentiful and beautifully preserved fossils, of great interest to scientists, collectors and visitors, and a source of income to local people for upwards of 200 years. Fossils from here can be found in museums throughout the UK and abroad.

In preparation for the bid for World Heritage status for the Dorset and East Devon coast (achieved in December 2001), it was recognised that there needed to be some form of management of fossil collecting specific to West Dorset, within the overall management plan for the proposed World Heritage site.

A broadly based committee was formed under the chairmanship of Dorset County Council to decide how best to achieve this, and much discussion and consultation took place before agreement was reached. Strict regulation of collecting as proposed (by Dr. Page) during the consultation process was rejected as being unenforceable, in view of the length of coastline to be policed with its numerous access points and many thousands of visitors throughout the year, and probably counter-productive through alienating the collectors without whose time, effort and expertise the fossils would sooner or later be damaged or destroyed by the sea. For these and other reasons, the much preferred course was to work *with* collectors by means of a voluntary code, recognising their essential role in recovering the fossils.

The collecting code

The aims of the resulting code are:

- *To promote responsible collecting.* The code provides guidance and advice to that effect.
- *To control in situ digging in the cliffs.* This is principally to protect the fossil-rich horizons so that they remain available for study. Digging *in situ* is banned unless the landowner gives consent in appropriate cases. Unauthorised digging is now much less than before the code was adopted, and no horizons are unavailable for study as a result of any such digging. Landowners can take civil legal action against offenders (e.g. by seeking an injunction) but this could be costly. Prosecution may also be possible.
- *To clarify ownership of the fossils.* The participating landowners (Charmouth Parish Council and The National Trust) have publicly affirmed their ownership of the fossils by means of the code, but agreed to transfer ownership to those collectors who follow its provisions. Fossils acquired **not** in accordance with the code may be regarded as stolen (Taylor and Harte, 1988). The claim that 'the majority of the fossils already belong to the state' (Page, 2006 p. 22) is entirely wrong and not supported by the facts or the law.
- *To promote the acquisition of 'key scientifically important' fossils by suitable museums.* A recording scheme which is unique in the UK – a public record – primarily for these 'category 1' specimens (as defined

in the guidelines to the code) was created to help in this aim. Collectors are required to register their category 1 fossils so that anyone interested can see what has been found and by whom, and if they wish to sell or otherwise dispose of them, they must first offer them to UK museums for up to six months. Collectors are strongly encouraged to register category 2 fossils ('of some but not key importance'), but are not obliged to, and no restrictions apply to their disposal. A summary of fossils recorded under the scheme was provided in Newsletter 33 (Edmonds 2006). The record continues to grow.

- *To encourage communication between collectors, researchers and museums.* The records are held at the Charmouth Heritage Coast Centre, whose staff can also help with contacts between collectors, researchers, etc. The recording scheme has undoubtedly contributed to the constructive relationship that is developing between collectors and staff at the Natural History Museum, London.

Those who formulated the code do not claim it to be perfect but that it is both the most practical and equitable way of dealing with this difficult issue, taking account of all the realities of the situation here in West Dorset, and the reasonable concerns of all interested parties. The full code, guidelines and register of fossils can be inspected at www.charmouth.org by following the link to 'fossil collecting code', and see also Edmonds, 2001.

Discussion of the analysis

Returning to the analysis (Page 2006, p. 23), this is basically the same as that previously used in 'the Hettange paper' (Page 2005, p. 130). In the analysis Dr. Page compares the numbers of fossils 'of particular scientific importance' recovered during construction of the Charmouth bypass with those recorded from the coast under the West Dorset fossil code during its first three years of operation.

The key statistic on which he relied in both the Hettange paper and Newsletter 33, his 'useful standard', is the number of reptiles of 'particular scientific importance' from the bypass (3) compared to the number recorded on the West Dorset coast register (14). 'As reptile specimens are well recorded by the collecting code they can become a standard for estimating the recovery of other groups. For instance as 3 fragmentary reptile skeletons were found on the bypass site and 14 on the coast during the first 3 years of the recording scheme, a multiplier of 4.7 can be derived (e.g. $3 \times 4.7 = 14$) and expected numbers of scientifically important specimens for the coast so derived' (Page 2005, p. 130). Thus he calculates, for example, that since there were 106 bypass insects of 'particular' importance, there should have been 498 (106×4.7) of similar importance recorded on the coast register in those 3 years; 10 bypass fishes meant there should have been 47 recorded on the coast register and so on!

Clearly there is a striking difference in the number of reptiles recorded from these two sites and in their numbers relative to the numbers of fossils in the other groups. Dr. Page produced a simple explanation for this, i.e. that the number of reptiles recorded from the coast

was correct but the numbers of other fossil groups (from the coast) were almost five times *under*-recorded. This explanation enabled him to claim the code 'is failing, some might say spectacularly' (Page 2006, p. 21) and that the authorities responsible for managing the World Heritage site are therefore guilty of 'extreme negligence' (Page 2005, p. 130). This is severe criticism indeed. Can it be justified on the basis of a few simple statistics? Are the two sites so similar that such a direct comparison can safely be made? In fact, in some important respects they are very different. Are there other factors that should also be taken into account in assessing the validity of the analysis and the conclusions drawn from it?

1. The *range* of reptile bearing Lower Jurassic strata available on the coast was *far greater* than on the bypass. Obviously this would be likely to have a major impact on the relative numbers of reptiles from the two sites. Seven of the 14 coast reptiles appear to have come from strata not exposed on the bypass. It should be pointed out that although certain strata are better known than others for producing reptiles, the frequency with which they occur is entirely unpredictable. The same is true, of course, for fossils in the other groups.

2. The means of exposure differed, i.e. heavy machinery working at speed on the bypass compared to natural erosion on the coast. Reptiles in soft shales being excavated by machinery are much more vulnerable and difficult to see than if exposed by the obviously far gentler and slower process of erosion, particularly on the many hectares of foreshore shales exposed at low tide (Fig. 4). This could help to explain the relatively low number of reptiles found on the bypass and why those that were found were in limestone concretions, not shale. There was a much greater chance of them being destroyed unseen on the bypass than on the coast.

Fig. 4. View of Dorset shoreline looking east from Lyme Regis; note the exposed platform of Liassic rocks at low tide.



3. Lower Jurassic material excavated from the bypass contained a high proportion of fossiliferous concretions, in particular huge numbers of the famous 'Flatstones', which are typically up to about 18 centimetres thick and between 50 and 100 kilograms in weight. The total volume of Lower Jurassic material eroded from the coast typically contains a smaller proportion of similarly fossiliferous concretions and a much greater proportion

of reptile bearing shales, in the absence of any major cliff collapse involving such concretions, of which there were none in the chosen three year period. This is relevant to the validity of the analysis since it relies not only on the *absolute* number of fossils, but also on the *relative* numbers of fossils in each group, which it presumes should be the same from the bypass as from the coast.

4. In his analysis, Dr. Page claims that there should have been 4.7 more times insects, fish and other fossils from the coast in the chosen three years than from the bypass. If correct, it would follow that in those three years, 4.7 times more of the equivalent Lower Jurassic material must have been eroded from the coast than was excavated from the bypass, in order to produce 4.7 times more fossils. Past studies of erosion rates in the area, however, appear to indicate that rather than 4.7 times *more* of the equivalent material being eroded from the coast in those three years, there was probably much *less* than was excavated on the bypass, and this takes into account the fossiliferous concretions found both to the east and west of Charmouth (Brunsdon & Jones 1976, 1980). There is no reference whatsoever in the analysis to the volumes of material either excavated or eroded, despite their obvious relevance to the number of fossils that 'would have been expected'.

5. The management practicalities and collecting requirements (see paragraph 6 below) for the bypass differed greatly from those for the coast. The bypass was a relatively small and compact site where access and collecting could be and were easily and strictly controlled (Sole 2001). There was an authorised group of eight experienced collectors allowed on site (only two at any one time) and *all* fossils were set aside for evaluation, which was done by the on site stratigrapher, Dr. Page. This was in complete contrast to the coast to which there is free and open access throughout the year, many access points, thousands of visitors, and thus no possibility of exercising a similar degree of control (Sole & Etches 2005).

6. The criteria to be applied in determining scientific importance were different between the two sites and this would be bound to affect the statistics. One could argue at length as to which are the correct criteria but it is surely difficult to argue that they should be the same for both sites. The bypass site was a unique short-term opportunity to collect Lower Jurassic fossils systematically in a controlled collecting environment, very unlikely to be repeated. This is obviously in complete contrast to the coast where fossils have been collected for at least 200 years (and will continue to be collected for the foreseeable future), many thousands of which have been deposited in museums. The criteria for the West Dorset recording scheme recognise and take account of those facts. They also take account of the trouble and expense that would be involved in maintaining a more complete record without obvious benefit.

In the above paragraphs, I have pointed out what I consider to be the principal weaknesses in the analysis. Clearly there are dangers in placing such unquestioning reliance on a few simple statistics, as in this case.

Consider how Dr. Page's calculations would have been affected had there been, for example, only one bypass ichthyosaur and 20 from the coast, or alternatively 10 from the bypass and only five from the coast! I consider the analysis to be flawed and the criticisms based on it to be unjustified.

Finally, I wish to echo Dr. Page's plea for meaningful and open (and I would add well-informed) debate on the issue of geoconservation. It is right that scientists should 'set the pace' but their views should not be considered in isolation from the views of those responsible for the management of sites, and of other site users. As a fossil collector for over 50 years (including about 30 as a professional collector), with a serious interest in conservation and management issues, I am concerned that the *practical* aspects of site management should never be overlooked in the formulation of policies and the drafting of legislation.

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'JURASSIC COAST' DORSET AND EAST DEVON COAST WORLD HERITAGE SITE UPDATE

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Conservation

The Science and Conservation work programme continues to be delivered while some of the demands and opportunities continue to be challenging. The Science and Conservation Advisory Group (SCAG) advise and support the work and we remain grateful to all of its members. We particularly welcome that Professor Malcolm Hart (Plymouth University) has taken on the role of Vice-chairman, helping to maintain the balance between geology/palaeontology and geomorphology (the latter represented by the Chair, Professor Vincent May). Professor Chris Wilson is another welcome addition ensuring better linkage between the conservation programme, and our burgeoning schools education programme delivered by Dr Anjana Khatwa. We are delighted that Keith Cole, Technical Secretary to the South Devon and Dorset Coastal Authorities Group has joined us at the start of the development of the new Shoreline Management Plan (see below), to ensure a strong link is made to the values of the World Heritage Site.

The monitoring programme established over the last five years is beginning to deliver results as the cliffs change and erode. Indeed, it has become a valuable and wide ranging resource to demonstrate change and site sensitivity, especially in relation to erosion rates. The monitoring database is working well and capturing data on natural and man made change, including planning applications and other threats, together with comments from others on site condition. This data has been used to compile a State of Conservation report. Some comments identify sites or interests that are unfavourable due to natural processes. The World Heritage Site Management Plan respects these processes and intervention is not seen as necessary unless a case is made for a specific requirement for research. Any excavations to improve access to the stratigraphy would have to be carefully balanced against the other designations for the site and especially the Special Area of Conservation (European Habitats Directive) designation. It is important to emphasise that 98% of the Site (or 61 of the 66 Geological Conservation Review sites) is in favourable condition and that the issues are, with the exception of Portland Harbour Shore, highly specific. To date there has been some resistance from landowners when approached to address specific site improvements but renewed efforts will continue to be made. The report is available on the 'Conserving the Coast' pages of our web site; www.jurassiccoast.org. This is an evolving document so we welcome continued comment.

The construction of coastal defences remains the greatest single threat to the Site. As a result, a very considerable amount of time is devoted to working with the coastal engineers and through the groups that represent them. Influencing hearts and minds with regard to coastal protection, and promoting an understanding of the role

of erosion in maintaining an internationally important, interesting and beautiful coastline, has to be the greatest priority for the entire World Heritage Team. The current major element of work is the review of the Dorset and South Devon Coast Shoreline Management Plan (SMP) that extends west from Durlston Head near Swanage, across the rest of the Site. This plan aims to identify long term, sustainable and co-ordinated management of the coast and it is therefore the proposed actions within it that will have a major bearing on the conservation of the Site. Details are available at: www.sdadcag.org. There will be public consultation so it is important that people who have an interest in the coast comment on the management options selected during the consultation period. There is a facility on the web site to register as a stakeholder and become a consultee. This is the 'dull stuff' in our work, unlike education, interpretation, etc., and therefore it is easily overlooked. But getting the balance right within the SMP is absolutely essential in order that the Earth heritage values of the coast are recognised and protected. Contributions from experts will be essential and this will be a major part of our work in the coming two years. We will seek views via the Science and Conservation Advisory Network (SCAN), and those with a particular interest may wish to be in direct contact with the SMP organisation. In parallel to the above, a monitoring programme has been established by the Coastal Groups with Government funding. This is a multi-million pound project to monitor the coast to a common standard using the latest techniques. It already is a fabulous resource that will grow in the coming years. The data is freely available at the Channel Coast Observatory (www.channelcoast.org).

The SCAN remains an essential vehicle for consultation about threats to the Site. Its principal value is to inform scientists remote from the Site about local threats, issues or opportunities and gain their expert opinion in order to strengthen our case in protecting the Site. The note on the SMP and monitoring programme above clearly demonstrates its value.

The beaching of the 62,000 tonne container ship MSC Napoli off the East Devon coast hit the international headlines. A number of containers were washed ashore and disgorged a range of materials from car parts to dog food and shampoo. Luckily calm weather allowed nearly all of the heavy fuel oil to be recovered while great efforts have been made to clear the beaches of rubbish. In terms of the scientific value of the Site, the littering represented no threat but clearly the incident has highlighted the potential risk from pollution, particularly oil that could have a material impact on the core values of the Site. The main casualties this time have been sea birds.

Finally, for a detailed view on the full range of our work, (conservation and research, education, tourism, sustainable transport, the arts and community engagement, etc.), a report on 'The First Five Years' was published in December 2006 and is available on our web site at www.jurassiccoast.org. Alternatively, we can post hard copies on request.

Research, site improvement and management initiatives
The World Heritage Site programme is not a mainstream research funder. That said, we are more than willing to explore ways to use World Heritage to support bids to fund research projects. We have been able to modestly fund a number of small research projects however, particularly where they inform management, and intend to continue to do so, subject to funding. A list of some of the projects funded through World Heritage can be found in our five year report.

West Dorset fossil code update

There have been 33 specimens of key (category 1) or some (category 2) scientific importance registered under the West Dorset fossil code since October 2006, which is a reflection on the rough winter. Highlights include a spectacular and virtually complete fossil fish, (probably a eugnathid), nearly 1m in length found by a couple with very little collecting experience, an extraordinarily well preserved leaf from the Upper Greensand and an ichthyosaur that looks very interesting but has yet to be prepared. Details are available at the Charmouth Heritage Coast Centre web site at: www.charmouth.org; just follow the fossil links. Further interesting finds have been made within the last few weeks that we anticipate will be assessed at the Lyme Regis Fossil Festival in May, by experts from the Natural History Museum.

Away from West Dorset, Steve Etches, an amateur collector at Kimmeridge, continues to build a spectacular collection from the Kimmeridge Clay. He is currently seeking to place this collection in a new local museum. In the interim, he is always delighted to show people around the collection subject to time and availability.

We remain confident that the code is the most effective way of managing the West Dorset palaeontological interests. Our priorities are that fossils are recovered rather than destroyed by the sea, that we know what is being found and that those finds of key scientific importance should become available for study. We have taken steps to curtail the excesses of a very small minority who dig in the cliffs contrary to the code and have demonstrated that, with the National Trust, we are prepared to take action against persistent offenders. The remaining issues for the code are:

Funding to acquire specimens. It has to be remembered that they represent a considerable investment in time and expertise to find and prepare.

Better communication between scientists, museums and collectors. The code acts as a forum through which research interests can be shared and communicated to all parties. However most scientists are 'remote' from the coast and therefore that contact is difficult. We would particularly welcome research proposals that could take advantage of this potential benefit.

CORRESPONDENCE

**Dorset-east Devon World Heritage Site:
Forming a research working-group**
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In 2001, we all had the good news that the “Jurassic coast” of south-west England was to become a World Heritage Site. The event was most pleasing, especially to those who had contributed to the Geological Conservation Review (GCR) and the selection of Sites of Special Scientific Interest (SSSIs).

Of course, the whole WH site, not just the “Jurassic coast”, contains many GCR sites - Triassic to Cretaceous. They have been SSSIs since the 1950s, and they have enormous potential for future research, as well as training and education in general. Since 2001, there have been widespread discussions about certain commercial activities that threaten the integrity of sites, sea defences, damaged and decayed condition of geological sites, and the usability of localities for science and education. There is clearly a need for a scientific ‘voice’ in planning the future of the Dorset coast.

With this in mind, various research and geoconservation organisations have decided that one way to help move things forward is to form a research group to assist in the better running of the WH Site. Its purpose would be entirely practical - to create projects that will enhance the usefulness and status of the coast’s geosites and bring research benefits, such as digs to retrieve fossil material, others kinds of sampling or site improvement. We do not want to form yet another committee! Our aim is to support fellow activists, to participate in or promote all kinds of physical work for the retrieval of, for instance, fossil, sedimentary or geochemical information, and site enhancement for the purposes of better understanding and management, in fact any physical work that would generate data and improve GCR sites. In doing this, we want to help the staff of the WH Site, and county councils, to better protect and elucidate the coast’s many nationally and internationally significant geological sites.

The new research group will consist of individuals and representatives of the both the Jurassic and Cretaceous Subcommissions of the International Commission on Stratigraphy, the Jurassic-Cretaceous boundary working group (IUGS), the Devon RIGS group, ProGEO (European Association for Conservation of the Geological Heritage) and the British Institute for Geological Conservation.

This letter is an invitation to you to join and contribute to the activity of the working group. I hope, very much, that you can. Contact Bill Wimbledon at b.wimbledon@ccw.gov.uk, who will act as secretary to the new group.

GSSPs - WHAT ARE THEY FOR?

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We have over the years seen much argument in discussions of how and where to define the GSSPs called for by the ICS, as one of the main functions - if not the main function - of the ISJS and its Working Groups. To this end, we were provided with the famous *Guidelines* (Version II, 1996) listing the requirements to be fulfilled in making the choice. And it will not have escaped the notice of our members that in arriving at the choice there seemed to be conflicting factors to be resolved. On the one hand, these arose from the *Guidelines* themselves. What is meant by ‘completeness’ of the stratigraphic record? How do you assess such completeness in any particular case? Why does it matter - if indeed it does? What does ‘Global’ mean, in ‘GSSP’? Globally recognizable, or globally unique? On the other hand, they arise from conflicts between what the ICS seems to think is all that is required - the definition of unique Standard Stage GSSPs - and what we in the Jurassic have been doing for a century and a half way beyond that: taking into account the much finer chronostratigraphic *standard zonations* that we take for granted, reflecting much finer *time-resolutions* than those implied at Stage level, and hence the much greater *precision* of rock-datings that we achieve. At least one useful outcome of our recent deliberations over the Kimmeridgian basal boundary stratotype designation has been to exemplify just these conflicts. And in trying to resolve them, it seems to me the way is to go back to the basic questions that our man in the field wants answered. And in this, how can GSSPs help him? He reports:

(1) I have recorded a fine new section through a stratified outcrop and here is this bed that particularly interest me: what is its age?

(2) No radioactivity, no strontium isotopes, no Milankovich cyclicity (palaeomagnetism yes, but what by itself does that tell you?), no ... - so no direct physical chronometric date. Hence recourse to indirect methods, those of chronostratigraphy.

(3) Circumstantial evidence tells me that the bed *lies in* either the *older* Ruritanian or the *younger* Parthian of the standard geological column. Which is all very well; but what does that mean here, now, where I am standing, and how can I tell?

(4) So to the physically operational definition of the question: the bed lies either *below*, or it lies *above*, or it straddles the *time-plane* that defines the *boundary* between the Ruritanian and the Parthian members of the standard chronostratigraphical scale. This scale has no overlaps or gaps and time-planes in rocks represent zero durations of time. Good, but the bad news is that in its very nature, the time-plane cannot be precisely recognized at any place other than the one where it was *defined*, by a Golden Spike in a *type section*.

(5) Thence two questions: (a) what is this time-plane? How was it defined? and (b) how can I *recognize* it and hence decide among the three possibilities of (4)?

(6) There we have it. GSSPs define time-planes, no more, no less. And all GSSPs are Global. But in choosing a particular time-plane by means of a Golden Spike in a type section, what should guide us? What would be most useful? Clearly, if we cannot recognize a time-plane itself, the next best thing is to be able to recognize a stratigraphical level as close to it as possible, e.g. one characterized by guide-fossils. And among such candidates, the one most useful would be the one that is most widely recognizable - *correlatable* - and most closely age-diagnostic, giving us the highest *precision* of dating. So the job of selecting and designating a GSSP is primarily to identify the tools for time-correlation that are the best by these criteria. In the Jurassic, the experience of 150 years (!) tells us that the best tools are guide-fossils (and modesty forbids more than a casual mention of ammonites).

(7) The best guide-fossils having been identified, choosing a section from among the many that the criterion of correlation has identified as ones in which their biohorizon is well-developed should become a matter of secondary importance. But as we all know, the ability to correlate biohorizons depends on the quantity, quality and diversity of the fossils available. Hence the most logical choice of section for that final GSSP designation would be the one that has yielded the best sample of the biostratigraphic clock to be used as proxy for the chronostratigraphic time-plane the GSSP is meant to typify.

But what if the biostratigraphic clock has only a restricted biogeographic distribution? Or if later work discovers a section that has a better, perhaps more 'complete' succession at the GSSP? Or if I am being paid by an oil-company to date rocks by means of drill-chippings in which it has gone to great expense to destroy the ammonites? And so on: much additional fine print. It may be presumptuous of me, dear reader, to spell out these simple but to me basic ideas yet again. Yet looking back over the saga of the Kimmeridgian GSSP, and particularly over the final vote by its WG, is it altogether a waste of time?

GSSPs? – WE DO NEED THEM!

Nicol MORTON

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My dear friend John CALLOMON has written yet another pungent, and well-argued discussion on the question of the definition of the Stages of the Jurassic by GSSPs. Of course, John's (only?) interest is in ammonites, which does influence his thinking. I agree with most of what he writes, but give the following comments.

1. No definition will ever give us a globally recognisable chronostratigraphic boundary, so either we give up and have no means of reference to time-rock units by which to make comparisons from one area to another, or we make do with the best we can achieve at present. The latter is what we are all trying to do.

2. A geologist in the field should be mapping lithostratigraphic units, not chronostratigraphic units. Identifying age comes later.

3. There is an important distinction between correlation and definition. I maintain that in chronostratigraphy we should be correlating not boundaries but units, and the smaller the better. Hence to recognise, for example, the base of a Stage, we identify the smallest subdivision that can be used to characterise the basal part. Definition is distinct, and for this we do need a GSSP so that a unique time-plane is specified, not subject to error of interpretation of taxa, variation in time-ranges as a result of migration or ecological factors and so on. John himself applied this in the classic study of the Boreal Middle and Upper Oxfordian (Sykes & Callomon (1979); type sections, mostly in the Staffin area, were given for all the zones and subzones. Applying the principle established during the 1st Jurassic Colloquium (1964), that it is the base that should be defined, then it is clear that something equivalent to GSSPs was being established.

John also comments on the proposal for the GSSP for the base of the Kimmeridgian to be established in the Flodigarry section in the same classic area of Staffin Bay (Isle of Skye) as the Sykes & Callomon (1989) study of the Oxfordian. The main problem is over the selection of the (lower) *flodigarriense* horizon or the (higher) *densicostata* horizon. The latter is widely recognised, notably in Dorset, where it represents the base of the Kimmeridgian as defined by Salfeld. However, there is an important hiatus at the Oxfordian-Kimmeridgian boundary in this area and elsewhere, equivalent, approximately, to the *flodigarriense* horizon recognised in Skye.

Clearly the *flodigarriense* horizon represents an older assemblage than the *densicostata* horizon. The question then arises as to whether it should be placed in the Oxfordian or in the Kimmeridgian. There are two, in this case conflicting, principles to guide us:

1. The first is that once a boundary has been defined, any subsequently recognised older faunal horizon should be placed in the lower chronostratigraphic unit. If this were the case, the *flodigarriense* horizon should be Oxfordian. However, the Salfeld definition does NOT have this status because it has never been formally accepted (as distinct from tacitly accepted by some) and it has the uncertainty of the recognised hiatus in the type area. Here the *densicostata* horizon documents only the basal unit, NOT necessarily its base in practical terms.
2. The second was spelled out by W.J. Arkell in his seminal book (*Jurassic Geology of the World* 1956, p. 9):

'When a new fauna is found elsewhere, not present or not detected at the type locality, it falls readily into place if it comes between two zones already in the same stage, but if it falls at the boundary between two stages it has to be classed according to its nearest palaeontological affinities.'

In this case the *flodigarriense* horizon should be placed in the Kimmeridgian.

As far as I can see the “guiding principles” can be interpreted either way as far as the position of the base of the Kimmeridgian Stage (*flodigarriense* or *densicostata*) is concerned. For me the deciding factor would be “WHAT IS THE MORE PRACTICAL OF THE TWO?” The *flodigarriense* horizon has been recognised first in the Flodigarry section, but it remains to be established whether it EXISTS only there or whether it has TILL NOW ONLY BEEN RECOGNISED THERE. If it can be shown to extend over a wide geographical area then the *flodigarriense* horizon (representing, it seems, a more distinctive, therefore more recognisable faunal change) MAY be the more useful boundary marker for the base of the Kimmeridgian Stage.

Precedence for GSSPs within the Jurassic also give conflicting guidance. For the Sinemurian and Pliensbachian Stages the basal horizons, *Vermiceras quantoxense* and *Bifericeras donovani* horizons respectively, are more similar in status and occurrence to the *Pictonia flodigarriense* horizon than to the *P. densicostata* horizon. For the Bajocian the opposite is the case. The primary marker was selected at the *Hyperlioceras mundum* horizon rather than at the *H. incisum* horizon, because the former is more widely recognisable [It was also the only option for the more favoured Cabo Mondego section as GSSP]. For the GSSP of the Aalenian Stage the choices between proposed horizon and proposed section (*Leioceras opalinum* horizon at Fuentelsaz or *Lytoceras torulosum* horizon at Wittnau) were never separated.

It seems to me that the choice of marker horizon for the base of the Kimmeridgian Stage, or indeed for any other chronostratigraphic unit, should be approached with an open mind so that THE MOST USEFUL can be selected.

**REQUEST FOR SPECIMENS OF THE
GENUS PSEUDOGREGORYCERAS
(AMMONITINA, OXFORDIAN)**

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After our revision of the Middle Oxfordian species of *Gregoryceras* (Bert et al. 2003; Bert & Enay 2004; Bert, 2004), we have finished our study of the late Oxfordian species, submitted to *Geobios* for publication (Bert, Enay and Atrops, subm.).

We are now planning a study of the Early Oxfordian genus *Pseudogregoryceras*. Species of this genus are rare and never numerous, often as only a single specimen. We have specimens from Switzerland and SE France, including those figured by Jeannot, Gygy, Bourseau and Bert. Other specimens will be available from South Spain (A. Checa), Slovakia (J. Schlogl) and Kutch, India (J. H. Callomon).

In personal collections or in collections housed in museums or other scientific establishments there are

probably some isolated and unknown specimens. It would be interesting and useful for such specimens to be included in this wider survey of the genus, whose systematic position relative to *Gregoryceras* also needs to be revised.

We are asking for help from the Jurassic community in searching for, and for the loan of, possible *Pseudogregoryceras* specimens collected by you or housed in collections.

Thank you very much for your help.

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BOOK ANNOUNCEMENT

Spela GORICAN

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Catalogue and systematics of Pliensbachian, Toarcian and Aalenian radiolarian genera and species

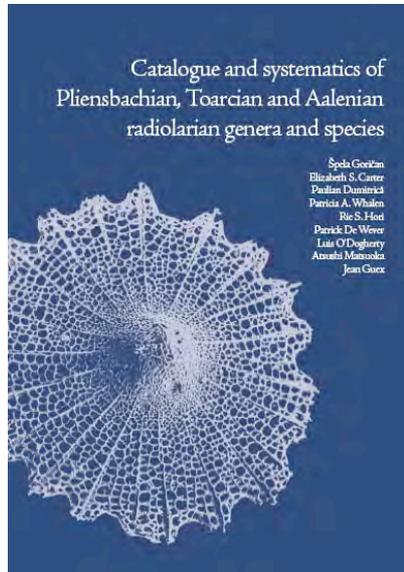
Authors: Spela GORICAN, Elizabeth S. CARTER, Paulian DUMITRICA, Patricia A. WHALEN, Rie S.

HORI, Patrick DE WEVER, Luis O'DOHERTY,
Atsushi MATSUOKA and Jean GUEX

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Abstract: This volume comprises a catalogue of 90 genera, 274 species and 13 subspecies of Pliensbachian, Toarcian and Aalenian Radiolaria. Two genera, 37 species and 3 subspecies are new formal descriptions, 24 species are described in open nomenclature. Each taxon is presented with a complete and up-to-date synonymy, original description and original remarks (translated into English where necessary), subsequent emendations, remarks by the authors of this catalogue, and etymology. Descriptions of species/subspecies further contain the original measurements, type locality, and data on geographic distribution. Plates illustrate the holotype and one or several specimens from our material, from different paleogeographic realms where possible. The material was collected from 30 measured sections in the Circum-Pacific belt (Baja California Peninsula, Oregon, British Columbia, Japan) and the Tethyan realm (Oman, Turkey, Slovenia, Austria). Abbreviated locality information and a list of all treated taxa are given in the last two chapters.

Contents:

1. Introduction (1.1. Objectives of this publication, 1.2. Organization of chapters) p. 9.
2. Systematics (2.1. Concepts of systematics and limitations, 2.2. Notes for user, 2.3. Systematic description of genera and species) p. 13
3. Description of localities p. 415
4. Listing of species (4.1. Alphabetical listing by genus, 4.2. Alphabetical listing by species, 4.3. Listing in ascending order of species/subspecies codes) p. 427
5. References p. 439.

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VOLUMINA JURASSICA – JOURNAL FOR JURASSIC SYSTEM

Thomasz PRASZKIER, *Editorial Board*
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Volumina Jurassica is a geological journal devoted to the publication of original research papers on all aspects of the Jurassic System. Over the last four years the format of the journal has been gradually modified. The majority of the first issues were published in Polish (with the Polish title "Tomy Jurajskie") because they were addressed to the Polish Jurassic community. However, rapidly growing interest from foreign authors and readers made the editors aware that there is a significant need for an international journal specialising on the Jurassic. Consequently, the decision was taken that the journal should develop into an English language publication of this nature.

The current challenge for the editors of *Volumina Jurassica* is to create a platform for Jurassic researchers and scientists across the world to exchange information relating to the Jurassic System, so that the journal will become a widely acknowledged forum for publishing detailed reports on the latest scientific discoveries relating to the Jurassic. Our long term goal is to create a platform for global exchanges - a journal publicizing the outputs of the Jurassic community from around the world by publishing original research papers on all aspects of the Jurassic System.

As many of you already know, the Abstracts for the 7th International Congress on the Jurassic System, held in Krakow in September 2006, were published in volume 4 of the journal. The Congress papers submitted will, after the refereeing and editorial processes have been completed, be published in volume 6 of the journal. For up-to-date information, please visit the web site [at www.voluminajurassica.org].

To accomplish this mission it is essential for the journal to be included in the Thomson Scientific Master Journal List (the so-called "Philadelphia List"), which seems quite a challenge for such a young journal! This is why we are asking for your support. It is especially crucial at this time to publish articles on new findings related to the broadly defined Jurassic issues. We look forward to receiving your articles and would also highly appreciate your comments, suggestions and feedback.

We hope that together we will develop *Volumina Jurassica* into a high-standard international journal, which will be of mutual benefit to the whole Jurassic community. Hence we are honoured to invite all Jurassic researchers and scientists to collaborate with *Volumina Jurassica*.

**POLITICS AND FOSSILS IN THE UK –
ANOTHER VIEW**

Jonathan LARWOOD

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In *ISJS Newsletter* 33 (22-25) Kevin Page explores some aspects of fossil collecting in the UK. He accused England's then statutory nature conservation agency, English Nature, of information control, denial and suppression and taking an approach that would make George Orwell's 'Ministry of Truth' proud - strong accusations but rather than control, deny or suppress them, here is another view of Kevin's analysis.

Kevin presents a comparison between the results of collecting on the Charmouth Bypass (1989-1990) and the West Dorset Coast Fossil Collecting Code register (1999-2002) and uses this comparison to demonstrate that the Code has delivered little scientific benefit. Since the publication of this data, as Kevin says, concerns were expressed about the way in which the data was being used and the points raised and discussed are briefly outlined here.

Our main concern is that there are substantive differences between the Charmouth Bypass and coastal sections being compared, both in terms of the geology encountered and the collecting methods adopted. These include a significant difference in stratigraphical range, differences in volumes of material involved and the collecting methods adopted and different criteria for recording specimens between the two areas. Given these substantive differences, one may actually expect a substantial difference in the fossil records between the two areas and it therefore seems difficult to use this comparative data to demonstrate that the Code has delivered little scientific benefit.

Taking a more positive view, in the same issue of the *ISJS Newsletter* 33 (26-27) Richard Edmonds summarises the Code between 1999 and 2006. He emphasises a very important aspect of the Code - to promote communication and awareness between collectors, researchers and museums - and I would add to this communication with landowner and conservation agency. What has been established is an increasingly strong relationship with collectors on the Dorset Coast, the recording of scientifically important specimens which previously went unrecorded and now a partnership with the Natural History Museum which may bring new opportunities for museum collections and research.

This approach to consultation, dialogue and relationship-building is an important part of the way in which collecting practice, and indeed policy, has been developed in the UK in recent years. This was central to the development of English Nature's *Position statement on fossil collecting*. The West Dorset Fossil Collecting Code and Recording Scheme were both developed in collaboration with the scientific community, a range of collecting groups, landowners and land managers. In 2000 the conference *A future for fossils* (Bassett et al., 2001) brought together a dominantly UK audience (with some wider representation) to reflect on the approach being taken to fossil collecting - the proceedings set out a range of views and experiences on conservation and

fossil collecting. More recently, we have also explored some of the practicalities of managing palaeontological sites and set out some of this experience in a discussion document (all views welcome) (*Sustainable site based management of collecting pressure on palaeontological sites*) that can be found at: <http://www.geoconservation.com/EHWH/docs/fossil.htm>. This is a UK perspective that sets out some of our experience, a desire to share this and equally, a desire to learn from the experiences of others.

What is clear is that there is a range of views on the management of palaeontological sites and fossil collecting, and a range of approaches that have been taken. In the UK, in the context of existing site protection and legislation, we have developed a strong partnership approach involving as many interested parties as possible - the West Dorset Code is one of a number of examples. If anyone would like to contact myself to discuss any of these issues then please feel free to do so.

Lastly, to echo Kevin - 'Conservation practice and philosophy will only develop and improve if there is meaningful and open debate on matters of concern.' - I do agree and I hope what I have set out here contributes to this debate and the continued sharing of practical experience.

Reference

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**SESSION ON THE JURASSIC SYSTEM AT
THE 2006 ANNUAL MEETING OF THE
GEOLOGICAL SOCIETY OF JAPAN AND
PUBLICATIONS BY JAPANESE
SCIENTISTS IN 2006**

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A topical session, "The Jurassic System", was organized during the 113th annual meeting of the Geological Society of Japan (Sept. 16-18, 2006) in Kochi University. The following six talks and three posters were presented in the session and summaries are included in the abstract volume. A similar topical session is being planned for the next annual meeting of the Society (Sept. 9-11, 2007) in Hokkaido University.

Oral presentations:

- KOMATSU, T., HUYEN, D T. & JIN-HUA, C. 2006. Significance of Lower Triassic bivalves in South China and North Vietnam
- ONOU, T. 2006. Origin of Upper Triassic pelagic limestone from mid-oceanic Panthalassan basin: Sambosan accretionary complex, Japan
- TSUDUKI, H. & YAO, A. 2006. Jurassic accretionary complex of the Northern Chichibu Terrane in the Eastern Area of the Shima Peninsula
- ISHIDA, N. 2006. Upper Jurassic trench-slope basin deposits in the Southern Chichibu Terrane, Southwest Japan -sedimentary evolution and implication for accretion tectonics

- KAKIZAKI, Y. & KANO, A. 2006. The chemostratigraphy of the Koike Limestone Member, Soma-Nakamura Group
- TERABE, K. 2006. Barremian bivalves of Tethyan fauna from the Sebayashi Formation of Sanchu Cretaceous System, Kanto Mountain

Poster presentations:

- HORI, R., AKIKUNI, K. & IKEHARA, M. 2006. Search for the cause of Late Triassic extinction of microfauna recorded in deep-sea sediments of SW Japan
- IHORIIYA, N. & HORI, R. 2006. Biostratigraphy and geochemistry of Lower Cretaceous bedded chert sequence from Goshikinohama Beach, Yokonami Peninsula in the Shimanto Belt, Shikoku, Japan
- SHIBUTANI, S., HORI, R. & SAKAKIBARA, M. 2006. Geological and paleontological studies of Early Jurassic accretionary complex from the Ikuno district, Tamba Terrane, Hyogo Prefecture, Southwest Japan

Publications on the Jurassic of Japan or by Japanese scientists in 2006:

- KOIZUMI, K. & ISHIWATARI, A. 2006: Oceanic plateau accretion inferred from Late Paleozoic greenstones in the Jurassic Tamba accretionary complex, southwest Japan. *Island Arc* **15**, 58-83.
- HIRSCH, F. & ISHIDA, K. 2006: The Triassic-Jurassic boundary in the Middle Eastern Levant: The magmatic event. *Progress in Natural Science* **16**, 12-22.
- ISHIDA, K., KOZAI, T. & HIRSCH, F. 2006: The Jurassic System in SW Japan: review of recent research. *Progress in Natural Science* **16**, 108-118.
- HORI, N. & WAKITA, K. 2006: Early Middle Jurassic (late Aalenian) radiolarian assemblage in a manganese nodule from the Northern Chichibu Belt in the Ino area, Kochi Prefecture, Southwest Japan. *Journal of Asian Earth Sciences* **27**, 45-60.

THE VOLGIAN STAGE AND ITS WORLD-WIDE CORRELATION:

100 YEARS OF DISCUSSIONS

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The problem of the Volgian Stage has arisen since the end of the 19th century. Nevertheless, 50 years ago everybody thought that all terminal Jurassic Stages - Volgian, Tithonian and Portlandian (recently rejected from international usage) are more or less equivalent to each other. Casey (1964) and subsequently Zeiss (1968 and later) were the first to suggest differences in the ranges of the Tithonian and Volgian Stages. However, at that time the Upper Tithonian was still little known, and the lowermost part of the Berriasian usually considered as part of the Tithonian Stage, although the evidence was very tentative. Soon afterwards Kutek & Zeiss (1974) had additional evidence for the Volgian-Tithonian correlation. They found that the Lower-Middle Volgian transition corresponded closely to the Middle-Upper Tithonian boundary. At about this time, the first, doubtful, *Zaraiskites* were recorded from the Carpathians. The traditional view of Tithonian-Volgian correlation

still prevails. At the beginning of the 1980s were the first attempts to use mixed buchiid - ammonite assemblages for correlation, firstly based on sections in California and later Far East sections. However, all the ammonites invoked for correlation were badly preserved and undeterminable ('*Durangites*' of California and Far East) or hardly comparable with true Tithonian faunas of the Western Europe (*Berriasella* of Far East). At the same time the first information about the complex structure of the Ryazanian Stage in its type area appeared (Mesezhnikov et al., 1979; Mesezhnikov, 1984).

New information about the ranges of *Riasanites* and *Euthymiceras* in the Northern Caucasus and Russian Platform, also used for correlation, led to conclusions of an upper Berriasian age for the Ryazanian (Sey & Kalacheva, 1993). Finally, opinion about the Berriasian age of the Upper Volgian Substage became more and more popular, in spite of the fact that it used only indirect evidence. The ISC of Russia made a decision to reject the Volgian Stage from the international correlation chart, using it only for regional purposes. Hence, local geologists undertaking geological surveys in Siberia should use Tithonian Stage instead of the former Volgian!

Recently, correlation of the Lower to lowermost Middle Volgian and most of the Ryazanian with Tethyan successions was improved by Rogov (2004 a,b) and Mitta (2005, 2007). They showed that a) the basal portion of the Middle Volgian Panderi Zone corresponds to at least part of the Middle Tithonian Fallauxi Zone (Rogov, 2004 a,b), while the third ammonite assemblage of the Ryazanian (the two lowermost assemblages did not include any ammonites of Mediterranean affinities) should correspond with the upper part of the Occitanica Zone of the Berriasian.

Nevertheless there was an interval near the J/K boundary without remarkable ammonites. So, what about more or less precise correlation of the base of the Berriasian through the Panboreal Superrealm? If we cannot use joint molluscan records, let's try to use other approaches. Among these some results were received from the dinoflagellates and spore-pollen analysis, but recently published papers about it contradict each other (compare Hunt, 2004 and Iosifova, 2001). Moreover, even spore-pollen correlation of the sections studied with the Spilsby Sandstone yielding ammonites shows some contradictions (Abbink et al. 2001, fig.16).

An additional tool for precise correlation is provided by palaeomagnetism. Recently the existence of two very brief excursions (Kysuca and Brodno Subzones) near to the J/K boundary was traced through some sites in the Mediterranean region (Slovakia, Spain and Italy). These sections are mainly poor in ammonites (except the Spanish one) and were biostratigraphically subdivided by means of calpionellids. In spite of some problems with correlation of the ammonite and calpionellid scales, it seems to be unambiguous that the J/K boundary determined by the *Calpionella* lineage lies very close to that based on ammonites.

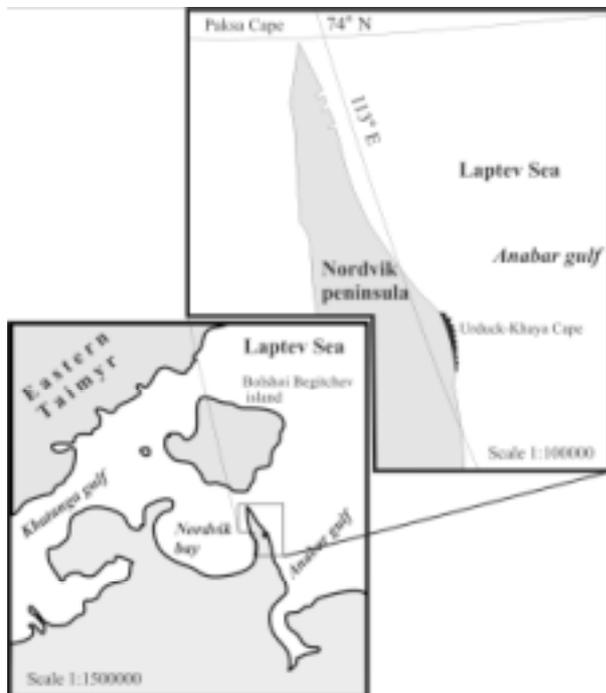
A first attempt to recognize the magnetostratigraphical units through the J/K boundary interval of the Panboreal

Superrealm was undertaken in the Portlandian-Purbeckian succession (Ogg et al., 1991; 1994). However, the following problems were difficult to resolve:

- 1) absence of ammonoids in the sections studied (they were correlated with Spilsby ammonite succession by palynology, see above);
- 2) the existence of stratigraphical gaps and/or intervals without precise palaeomagnetic signals;
- 3) the absence of well-recognizable short-time events (such as Kysuca and Brodno Subzones) through the section.

Finally, joint fieldwork studies were undertaken by a team of Russian and Czech geologists (Housa et al., 2007), who carefully studied one of the most full and well-known J/K section in the Arctic area, the Nordvik section (Laptev Sea coast, Northern Siberia, fig. 1). This section had been investigated previously for ammonites, belemnites, buchiids, spore-pollen and dinocyst assemblages, geochemistry and sedimentology (Basov et al., 1970; Pavlov, 1970; Zakharov & Yudovny, 1974; Zakharov et al., 1983, Zakharov, 1990, among others). During our fieldwork all details of biostratigraphical subdivision of the J/K boundary beds were supported by new ammonite records. Only one change in the zonal subdivision occurs, because we considered the Exoticus Zone as the last zone of the Middle Volgian (see Zakharov & Rogov, 2006, Zakharov et al., 2006 for details).

Fig 1. Location of the studied section in the Nordvik Peninsula, Urduck-Khaya Cape (Northern Siberia).



The 27 m thick part of the section from the Variabilis Zone of the Middle Volgian to the Kochi Zone of the Ryazanian were accurately sampled for palaeomagnetism. Most of the 370 oriented samples collected, with a sample interval of 2 -10 cm, proved suitable for palaeomagnetic studies (Chadima et al., 2006; Housa et al., 2007).

Both the Kysuca and Brodno Subzones, with total thicknesses of 17 and 77 cm respectively, were recognized. Thus, we can show that the J/K boundary defined by means of calpionellids in the Tethyan region corresponds with a level within the Taimyrensis Zone of the Upper Volgian (fig. 2). This zone is at the same time a close equivalent of the Nodiger Zone of the Russian Platform, considered as a terminal Zone of the Volgian Stage.

Photo: M.Chadima and S.Slechta sampling for palaeomagnetism near to J/K boundary at the Nordvik section, 2003 (photo by M.Mazuch).



Fig. 2. Boreal-Tethyan correlation of the J/K boundary beds by means of magnetostratigraphy; magnetozones of normal polarity marked with black and reverse polarity with white. Kysuca and Brodno – reversal polarity subzones. Arrows show position of the J/K boundary; the black one points out the palaeomagnetic correlation and the grey one the traditional J/K boundary of the Boreal areas. Ryazan. – Ryazanian Stage.

Tethys (Ogg, 2004)	Palaeomagnetic zones and subzones	Northern Siberia (Zakharov & Rogov, 2006)
Substages and ammonite zones		Stages, substages and ammonite zones
Lower Berriasian	Normal (N1b)	Chetites sibiricus
	Reversed (R1a)	Chetites chetie
Upper Volgian	Normal (N1c)	Craspedites taimyrensis
	Reversed (R1b)	Craspedites idensis
Upper Tithonian	Normal (N1d)	Præchetites radiosus
	Reversed (R1c)	Epivirgatus variabilis
		Middle Volgian

An additional non-biostratigraphical marker of the J/K boundary in the Panboreal Superrealm is located slightly

above the boundary, as determined by palaeomagnetism, at the base of the Ryazanian. This is a geochemical anomaly rich in precious metals such as iridium and considered as a signal of the Mjølner event (Dypvik et al., 2006). This level, corresponding to the lowermost Berriasian (an unknown level within the Jacobi Zone) has potentially a good traceability through the Northern Hemisphere. In the proposed scheme of Panboreal correlation (fig.3) both levels discussed can be well recognized from England to Northern Siberia through the different facies and ammonite zones.

Fig. 3. Zone-by-zone Panboreal correlation of the Jurassic-Cretaceous boundary beds. The J/K boundary is shown by two lines: the dotted line is this boundary based on magnetostratigraphical correlations; the bold line is the traditional position of the boundary in Boreal areas.

Spain, Italy (Ogg, 2004)		Northern Siberia (Casey et al., 1999; Zakharov & Rogov, 2000)	England, Northern Sea (Almon et al., 2001)	Russian plate, All-connections (Ogg & Rogov, 2005; Mitta, 2007)	
W.P. STAGE	Zone	Zone, Subzone	Zone, Subzone	Zone, Subzone	W.P. STAGE
BERRIASIAN (GARTHE) (GARTHE)	Subheriacensis	Parahoplites parvulus	Stenoceras	Coronites	RYAZANIAN (OGG)
	Berriacella	Stenoceras		Coronites	
	Subheriacensis	Stenoceras		Coronites	
	Subheriacensis	Stenoceras		Coronites	
UPPER TITHONIAN (MORNER)	Parahoplites	Coronites	Subheriacensis	Coronites	UPPER VOLGIAN
	Parahoplites	Coronites	Subheriacensis	Coronites	
	Parahoplites	Coronites	Subheriacensis	Coronites	
	Parahoplites	Coronites	Subheriacensis	Coronites	

Finally, we came to conclusion that the Volgian Stage should be correlated with the bulk of the Tithonian or even with the whole Tithonian. This idea does not contradict recent data about records of some typical Berriasian ammonites in the lowermost Ryazanian (Mitta, 2007).

This year we will try to study additional Upper Volgian to Ryazanian sections, located in the Arctic, by means of palaeomagnetism and ammonite biostratigraphy for establishing further evidence for Boreal-Tethyan correlation of the J/K boundary beds.

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IN MEMORIAM

SERGE ELMI (1936-2007)

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[translated N.M.]



On the 27th January 2007 Serge ELMI left us after a short but inexorable illness. In September we were, with our wives, together in Krakow at the 7th International Congress on the Jurassic System, where Serge presented several papers on the Pliensbachian-Toarcian. In October he was part of the jury for a thesis and nothing gave warning of his illness, even less of such a rapid deterioration.

Born in Saint Etienne, Serge ELMI was educated there up to his baccalaureate, obtained in 1954. He then studied at the University of Lyon from 1956 to 1960, the year when he achieved his Diplôme d'Etudes Supérieures and passed the examination as Teacher of Natural Sciences.

The subject of his DES, "*Le Jurassique inférieur et le Bajocien de la partie sud-ouest de l'Île Crémieu*", indicated the main direction of his future research and was part of the renewal at that time of studies on the Jurassic interrupted after F. Roman. In 1960 he accompanied me to the Colloquium on the Lias at Chambéry and in 1962 we were together at the First Colloquium on the Jurassic at Luxembourg.

The Lias and the Middle Jurassic of the Ardèche border of the Massif Central was the subject of his doctoral thesis (Doctorat d'Etat), which he was awarded in May 1968, in the middle of all the uncertainties of this disturbed period! His monograph, in the Lyon tradition, included both a detailed stratigraphic study based on rigorous field observations and a palaeontological section on the oppeliids of the Middle Jurassic.

Except for a period in Oran, Serge ELMI pursued his career as teacher-researcher at Lyon. At first, from 1958 to 1960, he was an instructor in the Earth Sciences Department while he prepared for his Diplôme d'Etudes Supérieures (DES) and Teacher's Certificate

(Aggregation), then as Assistant and in October 1962 as Maître-Assistant.

His thesis completed successfully, Serge was seconded to the University of Oran as Maître de Conférences (Senior Lecturer) from December 1968 to September 1973, at first as a military then as a foreign affairs appointment. Returning in September 1973 to the Earth Sciences Department at Lyon as Maître-Assistant, Serge became successively Professor 2nd rank (August 1979), then 1st rank (January 1995), finishing his career as Professor of exceptional rank (1998). Remaining in post beyond the age limit, he retired in 2004 with the title of Professor emeritus.

The main line of Serge's research had emerged since his DES work on the Île Crémieu and was more fully developed with his thesis of Doctorat d'Etat on the Ardèche margin and during his time in Algeria, two field areas to which he remained attached right to the end. The two main themes were the stratigraphy and biostratigraphy of Jurassic successions and faunas, especially of the Lower and Middle Jurassic, and the palaeontology of the ammonites of these Series.

His attachment to the Ardèche region led him to extend his field of interest to other periods in the history of the Ardèche margin, such as the Triassic and the Upper Jurassic, to other aspects of geology such as sedimentology and palaeogeography and to relationships between tectonics and sedimentation. He was thus one of the kingpins of the «Cevenol margin» site of the BRGM programme «*Géologie profonde de la France*». As collaborator of the *Service de la Carte géologique* of France he undertook the mapping of the sedimentary part of the Aubenas sheet.

Serge would develop these same themes in other countries where he extended the field of his research. Most important is North Africa, especially Algeria to where he returned often, then Morocco as an extension of his work on western Algeria. Within the scope of his research, carried out alone or in collaboration, he supervised or directed many thesis topics and trained numerous Algerian and Moroccan geologists, many of whom are now teachers-researchers in different Algerian and Moroccan universities.

Among other regions or countries where Serge ELMI took his research activities, are central Italy (Umbria, Marche) and the Iberian Peninsula, especially Portugal where he made many field trips and developed ongoing collaboration. This is without counting casual opportunities and requests which resulted in works which, though less central, are none the less valuable contributions. Thus, Serge was involved in various palaeontological studies on Jurassic faunas of Argentina, Slovakia, etc.

His great experience and international reputation in Jurassic stratigraphy were often made available. He participated in the Tethys and Peri-Tethys Programmes and in syntheses such as '*Biostratigraphie du Jurassique nord-ouest européen et méditerranéen*' and '*Synthèse du Bassin du Sud-Est de la France*'. He was equally involved in the organisation of scientific meetings or

congresses, in particular the Colloquium on Ammonitico Rosso (Rome), the 3rd International Symposium *Céphalopodes actuels et fossiles – Symposium F. Roman* (Lyon 1990). His active participation in numerous colloquia and congresses is not less; in particular, since his participation in the first, at Luxembourg in 1962, he has not missed any of the Symposia/Congresses of the International Subcommittee on Jurassic Stratigraphy – right up to that in Krakow in September 2006. It is within the framework of this Subcommittee that he led the Working Group on the Pliensbachian-Toarcian boundary and the search for the GSSP.

Serge was also involved in administrative responsibilities, at national level (elected representative of Maître-Assistants to the Comité Consultatif des Universités, 1965-1968), but more especially in his university: Director, successively, of the Département des Sciences de la Terre, of the Institut TOAE (Terre, Ocean, Espace, Environnement) and of the U.F.R. des Sciences de la Terre, Vice-President of University Claude-Bernard (responsible for personnel management).

Serge ELMI was promoted Chevalier in the Order des Palmes académiques in 1984, and Officier in 1990 [decorations for services to education in France].

Everyone who came near him, students, collaborators and colleagues, were impressed by his love of geology, his scientific curiosity, his ability to bring together the data of his pupils and transform them into numerous publications. Thus he leaves behind a body of work which is important for its quantity and quality and which will remain a foundation for future studies on Jurassic successions and ammonites.

Henri GAUTHIER (1924-2007)

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[translated by N.M.]



On the 11th of April 2007, Henri GAUTHIER was abruptly removed from the love of his family. His friends and colleagues learned with sadness that they will no longer have the opportunity and the pleasure to meet

him by a display cabinet of the collections, during a visit to the Muséum d'Histoire Naturelle de Paris.

It was on his return from a day of study at the Museum that he fell on the paths of the Jardin des Plantes which he knew so well, having crossed so many times. The fall was not fatal and the resultant operation was successful, but his tired heart decided to rest.

Most of us knew only one aspect of the personality of Henri GAUTHIER. For example, who knew of his love of music that he shared with and transmitted to his children and grandchildren, or that he was a member of a studio of ancient music and of a folklore group?

We would know him mainly through his activities at the Museum which he began more than thirty years ago, with the help of M. SORNAY, right up to retirement from his profession, a sort of double life, between his paid activities and those devoted to geology and palaeontology.

In fact, Mr. GAUTHIER did not come from the world of geology or of palaeontology; he was trained as a chemist. Already while studying for his baccalauréat he had to earn his keep as assistant chemist at Khulmann. After taking a classical course of physical chemistry at the Sorbonne, he worked as a research engineer in chemistry, then in charge of a physics laboratory. Several scientific articles published in specialist journals mark his professional activity.

Since his childhood Henri GAUTHIER had a passion for geology and palaeontology. As soon as he had the opportunity he began a second career solely for the intellectual satisfaction of learning and making known. The ammonites of the Jurassic were his field. Those who undertook the critical revision of the *Paléontologie Française* of Alcide d'Orbigny had recourse to Mr. GAUTHIER, for him to look for specimens that were truly from the original collection, or to identify type or figured specimens that did not always look like their figures.

Over and above his dedication to those who sought his help, he had acquired real competence respected by specialists. He was one of those amateurs who, in another age more respectful of those who gained knowledge by different routes, were known as "enlightened amateurs", and to whom palaeontology owes so much. As such, he had a guiding influence on many fossil collectors in whom he tried to instil a more scientific approach to their activities.

The principle work of his life will always be the critical revision of the *Paléontologie Française* of Alcide d'Orbigny, of which he undertook the coordination of two volumes. At the same time as he made available to the researchers involved in this huge work his help and his knowledge of d'Orbigny's collection, he undertook alone or participated in the revision of numerous species. I always remember our discussions, sometimes continued by exchanges of letters, often passionate, sometimes lively, but always rewarding.

His other scientific works are no less important; among these stand out those devoted to the biostratigraphy and palaeontology of the ammonites of the Middle Jurassic. We can note especially his work on the *Oolithe ferrugineuse de Bajoux*, in Normandy to which he was very attached, with important contributions to knowledge of the systematics of the Garantianinae; equally there are those on the Bathonian and the *Micromphalites* of Arabian origin in the Nevers region.

A reserved and efficient man, Henri GAUTHIER leaves a reputation as someone who, despite an appearance of fragility, had a strong character, passionate about palaeontology and loving ammonites, for which he displayed a great scientific curiosity, with a thirst for knowledge that was never-ending, always capable of marvelling.

A TRIBUTE TO ABBÉ RENE MOUTERDE

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I join all our colleagues in sorrow over the death of René Mouterde. He was one of the cornerstones of the revival of Jurassic studies in the post-war period. His first major work, on the Lias of the Massif Central - which was his Grande Thèse - set the standard. (Intriguing to see how its chronostratigraphy was in fact a direct continuation of the principles espoused by S.S. Buckman, in building bottom-upwards from a biostratigraphic base in - ammonite biohorizons!). He became one of the guiding lights in the beginnings of the careers of the other Three Musketeers of Lyon (at the other University, of course), one of whom was regrettably also lost to us this year. But he was also immensely influential in the founding of the new school of Jurassic studies in Iberia: in Spain, in the course of the liberalization of academic life in the later years of the Franco regime, through his association with Asuncion Linares in Granada; and in late-Salazar Portugal with, among others, Rogerio Rocha. Impressive has been the volume and quality of monographs on the Jurassic of Spain that have been published in the 1960-80s. And an equally important redescription of the Jurassic of west-central Portugal emerged as the product of the annual visits to the area around Cap Mondego by what some have called the Franco-Portuguese Geogastronomic Association, which now drew in another veteran from Dijon, Henri Tintant.

My first encounter with René Mouterde was at the famous (First) Colloquium on the Jurassic in Luxembourg in 1962. There was much talk about the typological definition of Stages as defined by Stage Stratotypes (- imagine!), but this created problems. Stage Stratotypes: but defined by whom? When? Where? And what do you do when Stages thus defined are found to overlap at the edges, or to leave residual gaps? Well, of course, as we all knew, Stages were the creation of one of our Founding Fathers, and French at that. So clearly an appeal to Original Scripture as committed to print by St Alcide was needed. And who better to read it to the hushed multitude than the Abbé Mouterde? Which he did with a superb, sonorous clarity that left us all deeply moved. But, regrettably, it did not solve the problems of those gaps and overlaps. But that is another

story. We met again on subsequent occasions, usually on field excursions, and I have slides on which he appears, reviving happy memories.

**THE 8TH INTERNATIONAL CONGRESS ON
THE JURASSIC SYSTEM 2010**

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As decided in September 2006 in Krakow, Poland, the 8th International Congress on the Jurassic System will be held in Sichuan, China in 2010. This will be the first time that the Jurassic Congress will be held in the Asia-Pacific region. During this year, the preparation of the Congress started in Suining and Nanjing respectively. The Congress organization group held its first working meeting on September 23rd in Shehong, Suining. Prof. Jingeng Sha, the Chairman of Jurassic 8, 2010, had intensive discussions with Suining colleagues. As a result of the discussion, the Congress venue will be in the four-star, lakeside, Fuluowan Hotel in Shehong County, which is a very attractive holiday location with excellent congress facilities and beautiful scenery near the Fujiang River.

The Congress will have five field excursions, including to the Triassic-Jurassic sequences and the T/J boundary in the Junggar Basin (Xinjiang), the marine Jurassic in southern Tibet, the non-marine Jurassic in the Sichuan Basin, the Jurassic and the J/K boundary and the Jehol Biota in Western Liaoning, as well as the Jurassic sequences in Vietnam and/or Thailand. The excursion leaders and the preparation work has been designed and started from this year, including the intensive field survey and profile investigations.

The Chinese organization committee will be established before the end of October 2007. This committee will be composed of active researchers from the institutions, universities, museums, petroleum companies and the local government agencies. The international scientific committee of the 2010 congress will be established in early 2008.

Concerning the dates for the Congress - as indicated in Krakow, many participants preferred August 2010. However, August is the hottest season in Sichuan, so the organizer would again ask the members of Jurassic committee to consider another choice, middle of October 2010, as this season will be the best time in the year with favorable climatic conditions for the congress.