

International Union of Geological Sciences  
International Commission on Stratigraphy

## International Subcommittee on Stratigraphic Classification **ISSC**

[www.geocities.com/issc\\_arg](http://www.geocities.com/issc_arg)

Chair        **Maria Bianca Cita**  
[maria.cita@unimi.it](mailto:maria.cita@unimi.it)

Vice Chair elect    **Ashton Embry**  
[Aembry@NRCan.gc.ca](mailto:Aembry@NRCan.gc.ca)

Secretary    **Maria Rose Petrizzo**  
[mrose.petrizzo@unimi.it](mailto:mrose.petrizzo@unimi.it)

Per vedere questa immagine  
occorre QuickTime™ e un  
decompressore GIF.

Per vedere questa immagine  
occorre QuickTime™ e un  
decompressore GIF.

### **NEWSLETTER N. 3** **(Circular n. 104)**

**December 2003**

# CONTENTS

<b>1. EDITORIAL</b>	<b>p. 1</b>
<b>2. ELECTIONS 2004-2008: RESULTS OF POSTAL BALLOT</b>	<b>p. 2</b>
<b>3. ICS NEWS</b>	<b>p. 2</b>
<b>4. SEQUENCE STRATIGRAPHY</b>	<b>p. 3</b>
♦ ANNOUNCEMENT	
♦ COMMENTS BY MEMBERS	
<b>5. NEW JOURNAL</b>	<b>p. 5</b>
<b>6. REPORT ON SEATTLE MEETINGS</b>	<b>p. 5</b>
<b>7. NEW APPROACH (BOTTOM-UP) TO FORMAL STRATIGRAPHIC     CLASSIFICATION</b>	<b>p. 7</b>
<b>7.1 COMMENTS ON STRATIGRAPHIC CLASSIFICATION TEST N.1</b>	
<b>7.2 STRATIGRAPHIC CLASSIFICATION TEST N. 2</b>	
<b>7.3 STRATIGRAPHIC CLASSIFICATION TEST N. 3</b>	
<b>8. POST-HEDBERG DEVELOPMENTS IN STRATIGRAPHIC     CLASSIFICATION FIRENZE 2004, AUGUST 27</b>	<b>p. 14</b>
<b>9. GLOSSARY ON STRATIGRAPHIC TERMS</b>	<b>p. 15</b>
<b>10. BOOKS AND REPRINTS RECEIVED</b>	<b>p. 15</b>

## 1. EDITORIAL

Step by step we are making significant progress in assembling a widely international group of motivated stratigraphers that are ready to talk to each other and to eventually find a consensus on updating the Guide of Stratigraphic Classification, which is our final goal.

I feel good: the elections went well (see point 2), beyond my expectations, as shown by the votes given to those members that took an active part in the process of open, improved communications. E-mail certainly plays a significant role in this process.

The Annual Report to ICS/IUGS is done.

The “bottom up” approach to stratigraphic classification survived the first test, and two additional tests are presented in this Newsletter, focused on different themes (basically nomenclature the test prepared by Manfred Menning, sequence stratigraphy the test prepared by Ashton Embry). I feel good because in this way we did not start from top down that is from conceptual issues, but from practical applications of the guidelines. A good start.

Beginning November I had the opportunity to meet vice-chairman elect Ashton Embry, that I did not know well personally and to start addressing plans and developing a strategy for the next term.

Now it is up to you, ladies and gentlemen, to move on.

We organized an ISSC sponsored During Congress Workshop in Florence, we even know the date: August 27, at the end of the Congress. It is DWO 15 with past-chairman Alberto Riccardi and myself as conveners. The tentative program is enclosed (see point 8) and I am expecting your substantial contribution to make this DWO 15 a scientific event.

ISSC Newsletter n. 4, next Spring, will contain the final program, with names and titles of the presentations. The difference between the two depends on you, on the abstract (see instructions on the Congress website at [www.32igc.org](http://www.32igc.org)) that you have to submit to me before January 10, 2004.

Good luck!

Maria Bianca Cita  
ISSC Chairman

## 2. ELECTIONS 2004-2008: RESULTS OF POSTAL BALLOT

The postal ballot for the elections of Chair and Vice-Chair for the term 2004-2008 gave the following results:

Votes received = 24

Votes for chairman (2004-2008):

First choice: CITA = 22  
EMBRY = 1  
BERGGREN = 1  
Second choice: BERGGREN = 4  
SALVADOR = 3  
RICCARDI = 2  
LUTERBACHER = 1

Votes for vice-chairman (2004-2008)

First choice: EMBRY = 17  
BERGGREN = 2  
GLADENKOV = 1  
MURPHY = 1  
Second choice: GLADENKOV = 5  
SALVADOR = 3  
EMBRY = 2  
ZACHARIASSE = 1  
CITA = 1  
WATERHOUSE = 1

I am very pleased with these results that show how a real, constructive, open participation is perceived and appreciated by the ISSC members.

Since ICS pointed out the opportunity to have an international (intercontinental) participation in the directory, Ashton Embry acts as Vice-Chair elect starting from now.

### **Nominated Officers for 2004-2008:**

Chair: MARIA BIANCA CITA

Vice-Chair: ASHTON EMBRY

Secretary and Webmaster: MARIA ROSE PETRIZZO

## 3. ICS NEWS

The Global Boundary Stratotype Section and Point (GSSP) proposal submitted by the Subcommission on Permian Stratigraphy and defining the base of the Wuchiapingian Stage and Lopingian (upper Permian) Series was forwarded to the ICS voting members for the official vote.

## 4. SEQUENCE STRATIGRAPHY

### ANNOUNCEMENT

The **2003 GSA Penrose Medal**, the most prestigious medal was given to **Peter R. Vail**, the founder of seismic stratigraphy - sequence stratigraphy



From the citation by Robert M. Mitchum we quote:

"I am greatly honored to introduce Peter R. Vail, the GSA Penrose Medalist for 2003. When Peter Vail introduced the concepts and applications of sequence stratigraphy, the effects on stratigraphic geology and seismic interpretation were comparable to those of plate tectonics on structural geology.

Pete's ideas on the unifying paradigm of eustatic cycles are probably as close to an original concept as most of us are privileged to see. Pete's worldwide experience with Exxon's exploration groups honed the concept into an immensely practical tool for hydrocarbon exploration and stratigraphic studies in general.

Pete began his career with Exxon in 1956 as a research geologist with the Carter Oil Company, an Exxon affiliate in Tulsa, Oklahoma. He and his lovely wife Carolyn reared a family of three children, who at first grew faster than his reputation. He relocated to Houston in 1965, at Esso Production Research Company, now ExxonMobil Upstream Research Company, and advanced to senior research scientist, the highest technical position.

Pete's ideas evolved naturally from his first pioneering work on the importance of stratal surfaces in rocks as geologic time lines. He soon recognized the cyclic occurrence of bundles of strata he called sequences in well logs, seismic reflections, and outcrops. Observing that sequence boundaries appear synchronous globally, he postulated that cyclic eustatic sea level changes are major controls on stratigraphy, along with basin tectonics and sediment supply. Eustatic cycle charts, seismic facies analysis, and the accommodation model of cyclic deposition were developed as applications.

In 1975, the first outside presentations of these concepts were made, appropriately, at a GSA convention. In 1977, these concepts were published in American Association of Petroleum Geologists Memoir 26 as first of many articles and memoirs.

All the early stratigraphic ideas were generated in the fertile brain of Peter Vail as spinoff from mapping and stratigraphic projects. Early studies involved well logs and outcrops, one of which was a study of the famous Eocene-Miocene unconformity in the Maracaibo Basin of Venezuela. Here Pete recognized Miocene onlap and facies changes in well logs. Many of the concepts of beds and bedsets are due in great part to the ideas of C.V. (Chuck) Campbell, an early co-worker.

About 1965, Pete's work was recognized enough to establish a very dedicated and enthusiastic seismic stratigraphy research group. This was a very fertile period of exponential growth. Worldwide cycle documentation and exploration applications were tied into Exxon's worldwide exploration of continental shelves and slopes. Seismic facies interpretation was systematized, cycle charts evolved rapidly, computer applications and mapping techniques were expanded, and biostratigraphy was improved. In 1978, the accommodation model and the concept of systems tracts allowed interpretation of sequences in well logs and outcrops as well as on seismic data. This broadening of interpretation beyond seismic data led to the name change to sequence stratigraphy.

In 1977, AAPG Memoir 26 was published, marking the first outside publication on seismic stratigraphy. Exxon's contribution to this publication was released only after all exploration managers agreed that seismic stratigraphy had gone about as far as it could go in Exxon. Almost immediately after Memoir 26 was published, these same managers closed the door on outside publication for a long time after they began getting phone calls from other companies complimenting Exxon's generosity in releasing these concepts.

In 1986, Peter was appointed the W. Maurice Ewing Professor of Oceanography at Rice University in Houston, where he has been a great influence on the lives of many students. In 1992-1993, during a sabbatical leave to France, he led studies of the sequence stratigraphy of European basins and revised and documented the eustatic cycle chart. He became professor emeritus at Rice in 2001 and still actively consults in Houston."

**COMMENTS BY MEMBERS ON SEQUENCE STRATIGRAPHY** based on the contribution by A. Embry "*Coming to Grips with Sequence Stratigraphy*". in Newsletter n. 2.

**Albert Brakel** (abrakel@netspeed.com.au) wrote:

In my capacity as National Convener of the Australian Stratigraphic Names Committee, I write a regular column in the quarterly newsletter "The Australian Geologist" on stratigraphic matters.

In the next column, I would like to publish the article on p.17-20 in the ISSC Newsletter N.2 by Ashton Embry on "Coming to Grips with Sequence Stratigraphy". This is a thoughtful review of the current state of sequence stratigraphy that should be brought to the attention of Australian

geologists. It will of course include Ashton Embry as the by-line. "The Australian Geologist" is published by the Geological Society of Australia, which is Australia's largest learned society for geoscience professionals.

I would like to have permission to publish this article

**Henk de la R. Winter** (hdlrw@na.rau.ac.za) sent the following discussion:

Firstly, I wish to both congratulate and laud the ISSC Chairperson, Maria Bianca Cita, for establishing a new and open Task Group venue for all continuation Members interested in sequence stratigraphy. I am sure that this will stimulate a possible solution to the two standpoints previously raised by Salvador and Berggren and their respective WG supporters concerning the definition and nature of sequence stratigraphy.

Ashton Embry initiated the discussion in Chapter 8 of Newsletter No. 2 with his contribution: "COMING TO GRIPS WITH SEQUENCE STRATIGRAPHY". Embry starts with the admirable statement that we need a chronostratigraphic framework for time constraints in facies analysis, for interpreting proper geohistory and palaeogeographic evolution. Agreed, because it eliminates lithostratigraphy as the most important rather than merely the preliminary mapping activity to be revised to time stratigraphy [Schenk & Muller, 1941]. But first, there are latent more fundamental definitions to be discussed until consensus can be obtained on sequences, based on the ICS publication by Remane et al. [1996] and the ISSC abridged version of Murphy and Salvador [1999].

Before one can deal with sequence stratigraphy, for example, note that the 1999 definition of stratigraphy may be fatally flawed, mainly because of previous flaws in Hedberg [1976] that were never corrected. Deliberations cannot succeed until these are eliminated. Problem is, that there is no built-in mechanism in IUGS for that to really succeed. I have explained this in detail in Annexure A of ISSC Circular no. 98, dated October 27, 2000, have proposed a solution to the problem, and have repeatedly referred to the solution *ad nauseam* with hardly any visible changes except the new stratigraphic procedural rules in the first Newsletter and now this review opportunity. Growth is so slow!

The title of the Circ. 98 article is "Discontinuities Date Deposition" and it contains a key diagram, Fig.1, after Wheeler [1964], also accepted and adopted by Hedberg [1978], defining the time stratigraphic [=chronostratigraphic] unit category geometrically. Without this diagram, it would require the proverbial thousand words to explain why one cannot start discussing sequences without studying the article first. Perhaps ISSC can again annex it, or I can try to transmit it electronically. Unfortunately, ISSC/ICS is currently too burdened with the albatross of non-elimination of stagnant errors hanging around the neck, to take advantage of the outcome of its suggested application in the bottom line. Scientific advance is accomplished by trial and error, by acceptance of the part that pass the tests of honest peer scrutiny, *and by discarding that which do not pass*, because everyone can make mistakes.

For today, let's look at the definition of stratigraphy, starting with the meaning of the name. Stratigraphy should mean the scientific record of rocks in terms of observed layers [Latin: strata]. The 1994 definition is broadened [from Hedberg, 1976] to include the description of all rock bodies forming the Earth's crust and their organisation into distinctive, useful, mapable units based on their inherent properties or attributes. I have reservations on attributes that are not also measureable properties. The 1999 definition derives directly from the 1994 glossary [p. 137] where the objectives of stratigraphy have been added. The reasons given for the broadening are unacceptable according to my practical tests, these being based on dated intrusive [thus discordant] and on nonlayered rocks in poorly specified associations. Geologists now misuse words such as attribute or association to suit their private agendas. The result is deterioration.

What is a rock body? In physics a body is a substance that may have gradational but even with some minor genetically related sharply bounded internal properties but with tangible and distinctive unit borders such as terrazzo tiles or pavements. In the field, lava flows are examples, or sediments deposited virtually without major interruptions such as subaerial unconformities. I have recorded and published on many

examples in support of the concept that natural depositional interruptions occur in nested clusters of many orders of magnitude due to plate tectonic controls. Ashton Embry is correct: we need regional chronostratigraphy to learn more about the processes from sediments and volcanic products so that the goal of accurate geological history can be within reach. Not global chronostratigraphy, because that does not exist, Remane, et al. [1996]. Only its time equivalent [geochronology] does, and in that little difference lies hidden all the troubles between theoreticists and practical geologists. It is a pity that the former and the latter MUST agree for science to advance, seeing that the educators gain the majority of seats in decision-making institutions, and vote out the latter when important issues are raised.

We may come to agreement that sequences are nested natural and regionally restricted unconformity-bounded chronostratigraphic units with both boundaries of their nested bodies of the same order of magnitude [shades of the chronostratigraphic hierarchy, and for the same reasons]. Sequence stratigraphy is the study of the superposition of local chronostratigraphic strata, a principle stated by Steno ages ago, and probably before him in the Renaissance period, possibly at the very place where the next major stratigraphic conference is to be held next year.

By now some might realise that the two parties of the Salvador WG are both correct if by continuity they accept theoretical continuity. Hence one needs stratotypes. In basin depocentres, subdivisions of minor orders do not matter, because *and only where* they have been deposited in continuity, that is, gradually, without visible interruptions.

Both parties could be in error if all of the WG agree with Salvador that sequences can never be local chronostratigraphic units. Evidently, Embry is hesitant about the only 'must always be' alternative, and I suggest this key matter next be probed exhaustively. A decade ago this was attempted, but the ghost of time-transgressive unconformities has not been properly buried yet.

## 5. NEW JOURNAL

We are still looking for a reference scientific journal where to publish our projects (i.e. the Glossary on Stratigraphic Terms), documents and the workshop proceedings. Besides the journals explored in Newsletter n. 2 (*Newsletters on Stratigraphy* and *Geologica Acta*) we have received the announcement of a new journal "*Stratigraphy*" that will publish refereed papers and professional notes in which advances in the stratigraphic sciences are applied to problems of general interest. It will be issued quarterly in simultaneous print and internet editions (see details at [www.micropress.org/stratigraphy/journals/surveys](http://www.micropress.org/stratigraphy/journals/surveys)).

Any idea and suggestions are welcome, but please remind that we need a no or low-cost journal. A decision will be made during the Business Meeting in Florence (August 27, 2004, 5.30 p.m.).

## 6. REPORT ON SEATTLE MEETINGS

The Annual congress of the Geological Society of America in Seattle created the opportunity to have important meetings concerning ISSC activities and interactions with other stratigraphy-oriented bodies.

### First

I met with Ashton Embry who came from Calgary for this purpose. Since ICS directory criticized the absence of an international partnership in ISSC, we decided that he will act as vice-chair elect starting from now. He is the leader of the new Task Group on Sequence Stratigraphy. He was not a member of the previous working group on sequence stratigraphy of ISSC, but took an active part into the Hedberg Conference (Dallas, 2001) with two excellent presentations.

His undisputable experience in both field mapping and subsurface basin analysis, and his willingness to start a third generation approach are testified by the article "Coming to grips with

Sequence Stratigraphy” published on ISSC Newsletter n. 2 and by the Stratigraphic Classification Test n. 3 published in this Newsletter (see point 7.3). He is invited to give two presentations in Florence : one at Workshop DWO 04 and one at DWO 15.

### Second

The same day (November 2, 2003) we were invited to attend the Annual Meeting of the North American Commission on Stratigraphic Nomenclature (NACSN), see below the agenda **(A)** and outline of my report **(B)**.

### **(A)**

#### **NORTH AMERICAN COMMISSION ON STRATIGRAPHIC NOMENCLATURE 58th ANNUAL MEETING AGENDA**

Sunday, 2 November, 2003, 1:00-5:00 p.m. Douglas Room, Sheraton Hotel, Seattle

1. Call to order of 58th Annual Meeting
2. Approval of agenda
3. Roll call
4. Introduction of guests (Prof. Maria Bianca Cita, Dr. Ashton Embry, Mr. Steve Walsh)
5. Approval of minutes of 57th Annual Meeting
6. Chair's report (Pratt)
7. Vice-Chair's report (Orndorff)
8. NACSN website <http://www.agiweb.org/nacsn/> and
9. Revised Code in CD and print format updates (Orndorff)
10. AGI Member Society Council Meeting reports (Pratt, Edwards, Orndorff)
11. NACSN History Committee Report (Jordan)
12. **ISSC activities report (Cita)**
13. Unfinished and new business:
  - a. Spanish translation of the Code (Ferrusquia)
  - b. GSA Bulletin discussion-reply exchange (Easton)
  - c. GAC Nuna meeting (Easton)
  - d. New journal Stratigraphy (Easton)
  - e. Annual Report for 53th-57th annual meetings combined (Easton)
  - f. IGC Workshop DWO 04 - Unconformity/Disconformity-bounded Units (Jordan, Edwards)
  - g. NSF policies on stratigraphic research (Lane)
  - h. Sequence stratigraphic terminology (Embry)
  - i. Chronostratigraphic concepts (Walsh)
  - j. Other items
14. Appointment of Nominating Committee
15. Presentation of scrolls
16. Adjournment of 58th Annual Meeting
17. Call to order of 59th Annual Meeting
18. Report of the Nominating Committee for 2003-2004
19. Election of Officers
20. Election of Commissioners-at-Large
21. Remarks of new Chair (Orndorff)
22. Recess of 59th Annual Meeting

### **(B)**

#### **ISSC ACTIVITY REPORT by M.B: CITA**

**NEWSLETTER # 1** distributed in February 2003

**NEWSLETTER # 2** distributed in May 2003

**NEWSLETTER # 3** in preparation, to distribute in Dec. 2003

#### **6 + 6 NEW MEMBERS**

S. Hasegawa (Japan), F. J. Hilgen (The Netherlands), M. R. Petrizzo (Italy), N. Riley (U.K.), A. Strasser (Switzerland), J. Zalasiewicz (U.K.), D. K. Choi (Korea), L. E. Edwards (USA), P. Giannolla (Italy), Y. N. Karogodin (Russia), M. Menning (Germany), W. E. Piller (Austria)



## POSTAL BALLOT – VOTE FOR THE TERM 2004-2008

### Results

Chair Maria Bianca Cita  
Vice-chair Ashton Embry

32<sup>nd</sup> IGC, FLORENCE 2004

### DWO 15 Post-Hedberg developments in stratigraphic classification

Conveners: M. B. Cita (Italy), A. Riccardi (Argentina)

### Keynote lectures

#### Report from DWO 04 Unconformity/discontinuity-bounded units,

Conveners: G.B. Vai (Italy), L.E. Edwards (USA), R.R. Jordan (USA)

- ◆ Position papers
- ◆ Contributions
- ◆ Other

### Task Group leaders appointed

Sequence

Cycles

### ● Business meeting

Ranking of members

Liaison

- a. with other ICS Subcommissions
- b. with National Commissions on Stratigraphy
- c. with Geological Surveys

It was a very interesting experience for me, that helps understanding some behaviours that I did not not fully appreciate previously, as the “Holy Writ” attitude toward the American Code.

Several ISSC members were there, namely Lasca, Owen, Wardlaw, Lane, Edwards.

I distributed posters of the Firenze Congress, and we started discussing how to avoid overlaps between DWO 04 and DWO 15 (see later under “Third”).

NACSN is the Commission on Stratigraphy of North America (USA, Canada and Mexico) but differs substantially from all the national or international Stratigraphic Commissions I am familiar with. Members are not elected by the scientific community but are appointed by the various associations or entities that are the constituent bodies (AAPG, Geological Survey, National Science Foundation, Geological Society of America, Association of Professional Geologists and alike).

Every year there are elections for a vice-chairman that becomes chairman the following year(for just one year). My impression is that NACSN founded in 1942, is a kind of corporation, and represents *The Establishment*.

Norman Lasca has been historically the liaison of ISSC, but apparently this did not work well in the past. Now, with electronic mail communications are much easier, faster and cheaper: in the future ISSC Newsletters received by Norman Lasca will be distributed by him to NACSN members. Unfortunately Lasca will not be present in Firenze, because August is his working season to do field work in the tundra. He is a specialist in continental Quaternary deposits and we deeply need his expertise to work out some reasonable guidelines in the near future.

NACSN members that I would like to have in our Subcommission are its 2003 chairman Brian Pratt from Canada and Ismael Ferrusquia Villafranca from Mexico. We will see after Firenze 2004.

Also invited at the meeting was Steve Walsh a young mammal paleontologist from the museum of Natural History in San Diego that wrote, writes and will write provocative articles and review papers in major journals against some very important members and /or concepts of the

stratigraphic community. I certainly was impressed by his brightness, but do not fully appreciate his “enfant terrible” attitude.

### Third

The day after (November 3, 2003) I met with Bob Jordan and Lucy Edwards, that are co-conveners with Giambattista Vai of workshop DWO 04 on “Unconformity- discontinuity bounded units” in Firenze, to dress realistic plans in order to have no overlaps, but a good integration, with workshop DWO 15 “Post-Hedberg developments in stratigraphic classification” that was requested by me at the Congress scientific committee after the Urbino meeting (as a Special Symposium), and is not included in the first circular of the congress.

It was made clear that:

- 1) Post-Hedberg workshop DWO 15 has a broader significance and hopefully is expected to have position papers and/or documents presented by Geological Surveys, Stratigraphic Commissions and alike;
- 2) UBSU Workshop DWO 04 is considering both surface and subsurface situations;
- 3) UBSU Workshop will precede Post-Hedberg workshop and convey its results to Post-Hedberg workshop by means of a 20-30 minutes report presented by one of the conveners.

I will assist (as an observer) to the workshop –if compatible with other congress – related commitments, and ISSC vice-chair elect Ashton Embry will present his views. Names of possible presenters were discussed. A call for papers will be distributed soon.

A joint special request was prepared for the organizing committee to include in the Congress final program both scheduled presentations and abstracts at the condition that all the abstracts arrive at the conveners in due time (January 10, 2004) and then transmitted by them to the organization.

### Fourth

Other informal meetings with ICS secretary general Jim Ogg, with Bill Berggren, Piller, John Van Couvering, M. Pierre Aubry, Bill Haq were very fruitful.

The new journal *Stratigraphy* (see point 5) (Editor John van Couvering, Scientific Editor Bill Berggren) offered to be our Journal (we will see).

CHRONOS initiative was on display (see the project description at [www.chronos.org/resources/index.html](http://www.chronos.org/resources/index.html)). The project has been funded for two years by NSF. If successful, long- term funding is foreseen.

## **7. NEW APPROACH (BOTTOM-UP) TO FORMAL STRATIGRAPHIC CLASSIFICATION**

Two new Stratigraphic Classification Tests based on “real situations” are here presented: test n. 2 prepared by Manfred Menning on the marine Devonian sections of Germany and test n. 3, prepared by Ashton Embry on Lower Jurassic shallow marine strata from the Sverdrup Basin of Arctic Canada.

Purpose of this experiment started in Newsletter n. 2 with a test on the stratigraphy of the Southern Alps, is to check and evaluate the degree of coherence and consistence in the application of the existing rules to real situations. We want to have a real, bottom-up basis for discussing at the DWO 15 “Post-Hedberg developments of Stratigraphic Classification” workshop in Florence 2004.

Please remember that the main responsibility of ISSC is to set up clearly defined rules for stratigraphic classification, to publicize and make them worldwide used, and to periodically update them, in accordance with new methodologies applied, and scientific progress.

So, please, answer ASAP! We look forward receiving numerous responses as we have members from various continents.

### **7.1 COMMENTS ON STRATIGRAPHIC CLASSIFICATION TEST N.1**

The questions were:

QUESTION 1 – The Dosso dei Galli (I) and Ponteranica (D) formations have been formally defined in a strictly hedbergian style; they have the same stratigraphical position and paleogeographic significance, a somewhat different lithological composition, no lateral continuity: the two depositional basins have always been separated. Do you judge them:

- a) a single lithostratigraphic unit? ☐
- b) two discrete lithostratigraphic units? ☐
- c) an UBSU? ☐

QUESTION 2 – “basal conglomerate” (G): never formalized so far; discontinuous in nature, and not always mappable, with a transitional upper boundary and separated by the metamorphosed variscan basement by a major unconformity. Is it:

- a) a formation? ☐
- b) an UBSU? ☐
- c) other? ☐

QUESTION 3 – How would you classify the classical historical Collio unit?

- a) a formation? ☐
- b) a group? ☐
- c) a synthem? ☐
- d) a complex? ☐

I was perhaps too optimistic to expect 20 answers to our first test, but the 12 answers actually arrived are good and document a fairly consistent interpretation of the present rules. In particular, the answer to the first two questions were in good agreement in considering (a) Ponteranica Fm and Dosso dei Galli CGL as two discrete lithostratigraphic units and (b) basal conglomerate as a member or a lithozone according to its local development and mappability.

More varied were the answers relative to the Collio unit, that we now consider as an “historical name” with the rank of a group. The comments provided by Brakel (Australia), Strasser (Switzerland), Menning (Germany) and Embry (Canada) are here reproduced: they make interesting reading.

**Albert Brakel**

abrakel@netspeed.com.au

QUESTION 1 -- (b) because they are different bodies of rock that have never been connected. They cannot constitute an UBSU because they are not bounded below by an unconformity, or, in the case of I, at the top; as well, both D and I have lateral facies relations with the Collio units.

QUESTION 2 -- (c) or possibly (a). As it does not appear to be always mappable, it may be best to classify G as a member of the overlying unit. However, it maybe justifiable to classify it as a formation if it is mappable in most areas, and is thick enough. It is clearly not an UBSU because its upper boundary is not an unconformity.

QUESTION 3 -- If I was forced to make a choice I would go for (b), but with reservations. In reality, E and H (like D and I) are separate formations because they have never been physically connected, and I would not group them together. They do not constitute a synthem because of their facies relations with other units, and because they are not bounded both top and bottom by unconformities.

The only UBSUs in the Orobic and Trompia Basins are the entire packages between A and Z, because only at A and Z are there unconformity surfaces. It would be justified allocating both

packages to a single UBSU if they both formed during the same regional depositional episode.

**Andre Strasser**

andreas.strasser@unifr.ch

QUESTION 1: two discrete stratigraphic units, as it is now. If we make one formation out of it, we ignore the fact that two separate basins are involved. In many other places two formations have a similar lithology and a similar age.

QUESTION 2: I would opt to classify the basal conglomerate as a member of the "Volcanic orobic complex", but this requires that this complex be officially defined as one or several formations.

QUESTION 3: I vote for a "group". Here again, this implies that subunits of this group have to be defined as formations, which seems to be the case at least partly.

**Manfred Menning**

menne@gfz-potsdam.de

QUESTION 1 – (a) Both units can be classified as members or formations respectively (without interpretation). (b) Both units can be allocated to the same UBSU (with interpretation, see f))

QUESTION 2 – (c) Unit can be allocated to the same UBSU like above (see f).

QUESTION 3 – Very difficult to answer because I do not know how the classical Collio unit has been defined. There are several possibilities:

E-Orobic Basin:

d1) Basal Conglomerate Member + unnamed volcanic member + Collio Sandstone Member + Ponteranica Member = unnamed Formation

d2) Basal Conglomerate Member + unnamed volcanic formation + Collio Formation incl. Ponteranica Member = unnamed (Sub-)Group

W-Trompia Basin:

e1) Basal Conglomerate Member + Collio Sandstone Member incl. unnamed volcanic layer + Dosso dei Galli Conglomerate Member = unnamed Formation

e2) Basal Conglomerate Member + Collio Sandstone Formation incl. unnamed volcanic layer + Dosso dei Galli Conglomerate Member = unnamed (Sub-)Group

E-Orobic Basin + W-Trompia Basin:

f) All units can be allocated to the same UBSU (= Collio UBU = units of d) + e)).  
(geologically interpreted)

**Ashton Embry**

AEmbry@NRCan.gc.ca

QUESTION 1 - I would define two separate lithostratigraphic units (formations).

QUESTION 2 - I think the basal conglomerate is worth naming and I would favour designating it as a member of a new formation which would encompass the "Volcanic orobic complex". I would not be upset if someone wanted to designate it as a separate formation.

QUESTION 3 - The Collio unit (formation) seems quite odd and its use for strata both above and below the Ponteranica Formation as illustrated on the time chart (Fig 2) is unacceptable. It cannot occupy both stratigraphic positions. In the Orobic Basin one could designate it as a group which would encompass a lower formation of fluvial clastics, the Ponteranica Formation and an overlying formation of fluvial clastics. I would stress again that a Collio Formation cannot both underly and overly the Ponteranica Formation. I can also see grounds for abandoning the term Collio for formal lithostratigraphic nomenclature. Its use in the Trompia Basin is very questionable and I would prefer a new formation name for the fluvial clastics and interstratified volcanics which underlie the Dosso dei Galli Formation in that basin. Right now the term Collio seems to be applied in a facies sense (all occurrences of fluvial clastics in the rift basins) rather than in a stratigraphic one (a good argument for abandonment).

## 7.2 STRATIGRAPHIC CLASSIFICATION TEST N. 2

### Classic (mainly marine) Devonian sections of Germany

Classify the stratigraphic units shown in Figure 1 which is part of the Stratigraphic Table of Germany 2002 (STG 2002). Units of the global scale are given in English instead of German.

**Question 1.** The internationally accepted terms of the global (chronostratigraphic) scale (GSSP based units) are in bold letters to distinguish them from regional terms and global terms which are not officially accepted until now by the ICS. Do you agree with this spelling in stratigraphic schemes and tables?

Yes ☐ No ☐ abstain ☐

**Question 2.** The STG 2002 shows regional historical stages (Ems to Wocklum) without the ending –ian. Do you agree?

Yes ☐ No ☐ abstain ☐

Question 3. The STG 2002 shows Regional stages (Gedinne and Siegen) without the ending –ian. Should be used here the ending –ian (Gedinnian, Siegenian)?

Yes ☐ No ☐ abstain ☐

**Question 4.** Most of the regional/local stratigraphic units of Hunsrueck-Taunus and Eifel are without classification. Should the units be classified as

Formations ☐

Members ☐

Both ☐

Others ☐

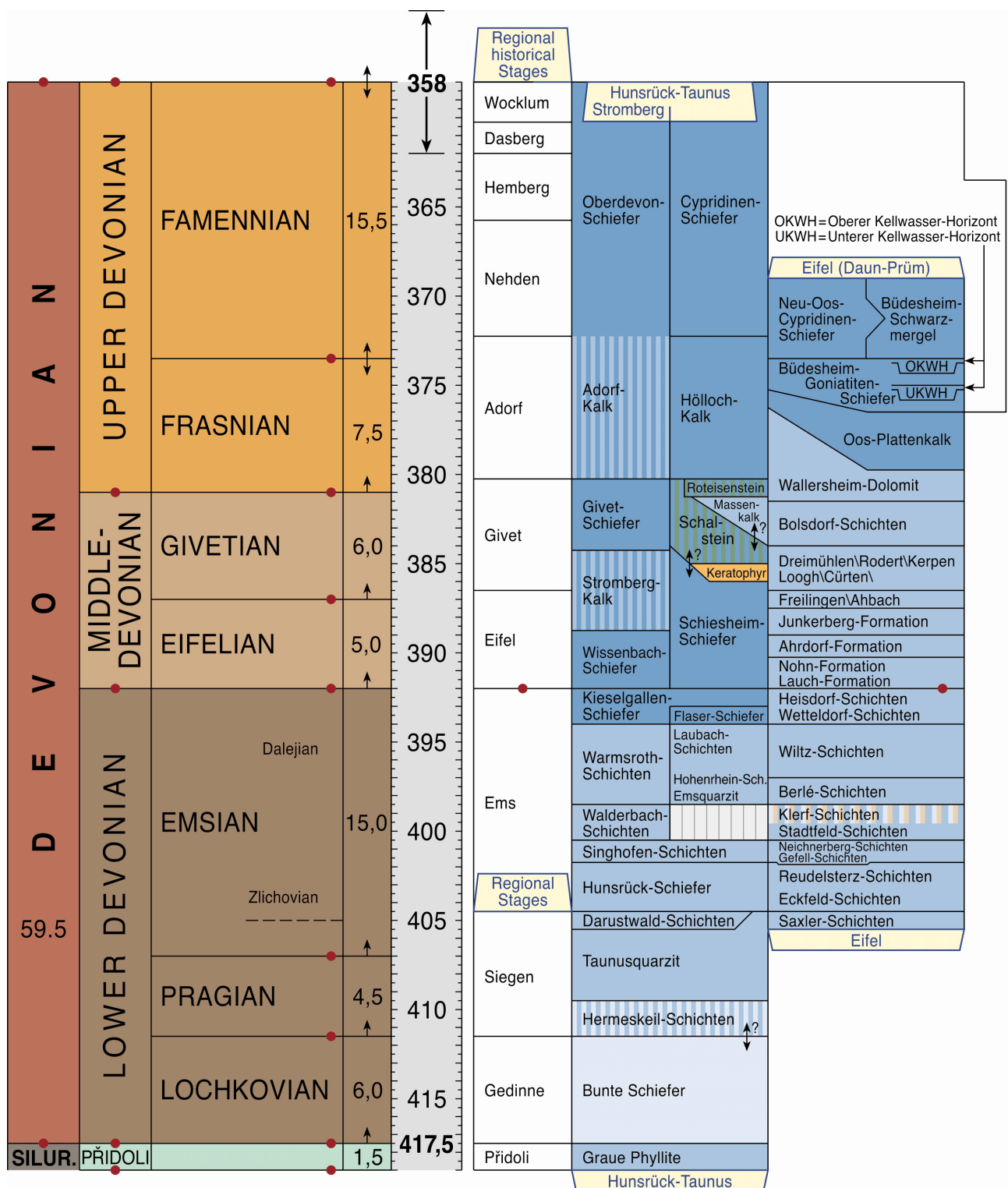
No opinion? ☐

**Question 5.** Is it absolutely necessary to substitute traditional terms like Cypridinen-Schiefer by, e.g., Taunus Formation?

Yes ☐ No ☐ abstain ☐

**Question 6.** Should be the Untere and Oberer Kellwasser-Horizont (UKWH, OKWH) classified as horizons?

Yes ☐ No ☐ abstain ☐



### 7.3 STRATIGRAPHIC CLASSIFICATION TEST N. 3

#### A Sequence Stratigraphic Problem

One of the thorniest problems of sequence stratigraphy is the extension of the sequence boundary basinward along the “correlative conformity”. As I discussed in my article, “Coming to Grips with Sequence Stratigraphy”, which was in the May 2003 ISSC Newsletter, it is critical that a sequence boundary include a correlative conformity. Unfortunately the methodology for drawing this portion of a sequence boundary is not well established.

The accompanying cross section depicts some Lower Jurassic strata from the Sverdrup Basin of Arctic Canada. The clastic strata were deposited in shallow marine environments (shoreface to offshore shelf) in a ramp setting. Facies analysis has allowed depth of deposition trends (shallowing-upward and deepening upward) to be determined and these are illustrated for each section. The basal contacts of the major sandstone units are gradational.

Two prominent unconformities (shoreface ravinements which have eroded through subaerial unconformities) are recognized on the basin flank (section A) and form the boundaries of the lower Pliensbachian sequence. The unconformities disappear basinward and the succession becomes conformable. The main problem at hand is the placement of the correlative conformity portion of the upper and lower boundaries of the lower Pliensbachian sequence in sections B and C.

A secondary problem is the delineation of formation boundaries in these strata. Five formal formations have been defined for these strata and the formation boundaries are shown for section C. These lithostratigraphic boundaries must be extended to sections A and B.

QUESTION 1 - The correlative conformity of the upper, unconformable sequence boundary of section A should be placed in sections B and C at:

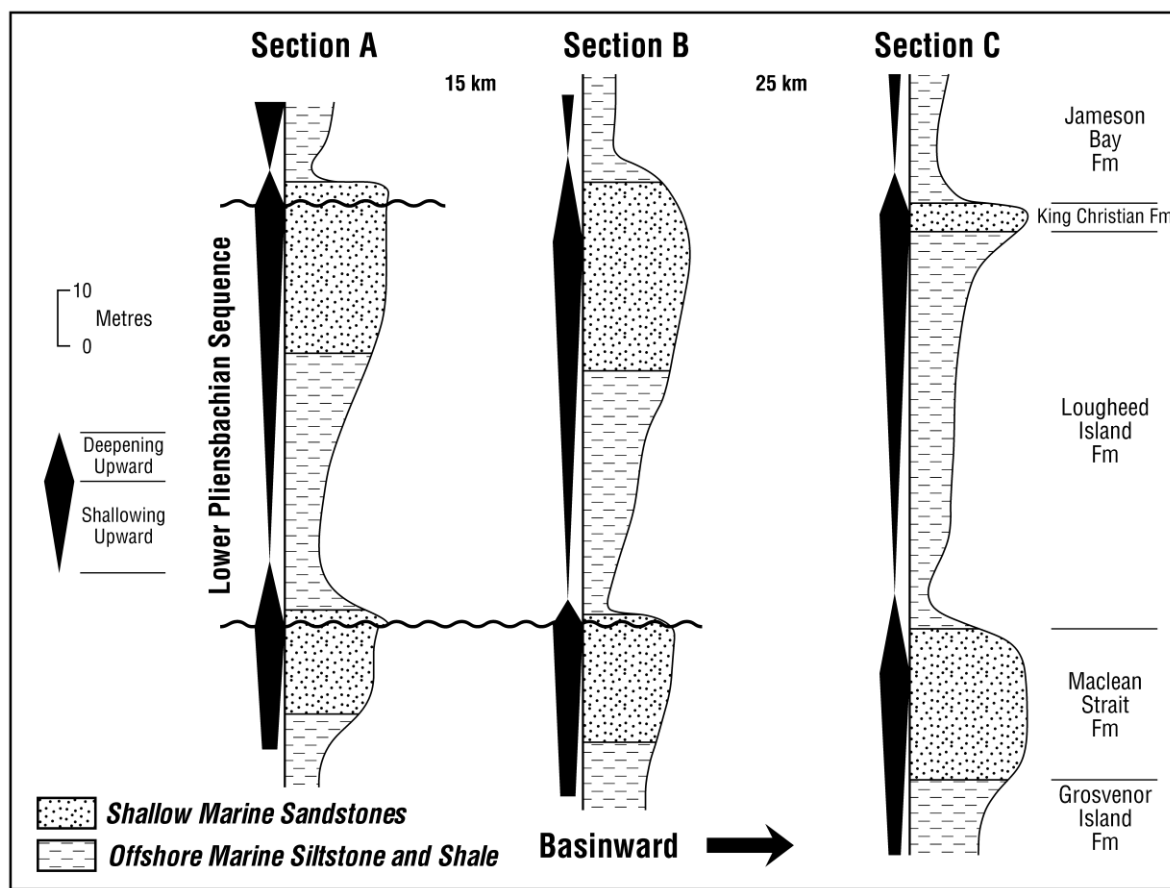
- a) The base of the sandstone unit
- b) The change from shallowing upward to deepening upward
- c) The top of the sandstone unit
- d) An interpreted time surface equivalent to the start of base level fall
- e) An interpreted time surface equivalent to the start of base level rise

QUESTION 2 - How many systems tracts can be scientifically delineated in the lower Pliensbachian sequence in sections B and C.

- f) Two (TST, RST)
- g) Three (TST, HST, LST)
- h) Four (TST, HST, FRST, LST)

QUESTION 3 - The top of the King Christian Formation in section A is best placed at:

- i) The change from sandstone to shale
- j) The unconformity



## 8. “POST-HEDBERG DEVELOPMENTS IN STRATIGRAPHIC CLASSIFICATION” DWO 15 FIRENZE 2004, AUGUST 27

It is planned for Friday August 27, last of a series of during congress workshops dedicated to various aspects of stratigraphy, a classic theme now "on stage". (see also announcement on back cover).

### TENTATIVE PROGRAM

- ◆ Background and Motivation of the meeting
- ◆ 2 Keynotes on Sequence Stratigraphy (30 minutes each)
- ◆ 3 Keynotes on cycles (30 minutes each))
- ◆ Report by the convenors on the outcome (s) of DWO 04 on UBSU (20 minutes)
- ◆ Position papers (15 minutes each)
- ◆ Free contributions (10 minutes each)

*Please remember to submit abstracts to the convener by e-mail before the general deadline of January 10, 2004) and don't forget the registration fees (March 31, 2004) and payment fees (June 30, 2004) deadlines, see details at [www.32igc.org](http://www.32igc.org)*



## **9. GLOSSARY ON STRATIGRAPHIC TERMS**

This project started by Prof Ivo Chlupák from the University of Prague (Czech Republic) on a multilingual Glossary of Geological Terms used in stratigraphy, could not be finished due to the unfortunate death of Dr. Chlupak. The project is still alive and we plan to continue until all the versions expected will be obtained. Still missing is the French version, whereas the version in oriental languages has been abandoned for practical reasons. We are looking for a journal interested in the publication.

## **10. BOOKS, REPRINTS AND CD-ROM RECEIVED**

We sincerely thank all the persons who sent or gave their publications to us.

Ismael Ferrusquia Villafranca for the CD-Rom of the semifinal version (October 30, 2003) of the “Codigo estratigrafico norteamericano 1983 “ by the Comision Norteamericana de Nomenclatura Estratigrafica.

Walsh S. L. 2001. Notes on geochronologic and chronostratigraphic units. GSA Bulletin, v. 113, no. 6, p.704-713.

Discussion and reply: Notes on geochronologic and chronostratigraphic units - Discussion by Easton R. M., Edwards L. E., Wardlaw B. R., - Reply by Walsh S. L. 2003. GSA Bulletin, v. 115, no. 8, p. 1016-1019.

King D. T., jr., and W. Petruny, 2003. Application of stratigraphic nomenclature to terrestrial impact-derived and impact-related materials, in Koeberl, C. and F. Martinez-Ruiz, eds., Impact markers in the stratigraphic record (Impact Studies, volume 2); Berlin, Springer-Verlag, p. 41-64.

### **THING TO BE DONE**

**SUBMIT ABSTRACT to the convener by e-mail  
(Maria. Cita@unimi.it) before the general deadline of January 10, 2004**

A GUIDED VISIT TO THE GRAVE OF NICOLAS STENO  
CONSIDERED THE FOUNDER OF STRATIGRAPHY IS  
PLANNED BY THE CONGRESS ORGANIZERS TO SATISFY  
THE REQUESTS OF SEVERAL STRATIGRAPHERS  
(SEE WEBSITE)

32<sup>nd</sup> IGC Florence, Italy August 20-28, 2004



**CALL FOR ABSTRACTS**  
**POST-HEDBERG DEVELOPMENTS IN STRATIGRAPHIC**  
**CLASSIFICATION**  
**WORKSHOP DWO 15**

Conveners: **M.B.Cita** (Italy) and **A.Riccardi** (Argentina)

This workshop is sponsored by the International Commission on Stratigraphy (ICS) of IUGS, and is organized by its Subcommittee on Stratigraphic Classification (ISSC). It is planned for Friday August 27, last of a series of during congress workshops dedicated to various aspects of stratigraphy, a classic theme now "on stage".

After an introduction on Background and Motivation of the meeting, we plan to have:

- ◆ a few invited keynote presentations on hot topics
- ◆ a report on the outcome (s) of DWO 04 on Unconformity bounded stratigraphic units,
- ◆ a series of position papers and/or presentation of documents dealing with stratigraphic classification or lexicons by national or multinational Stratigraphic Commissions, Geological Surveys and alike,
- ◆ free contributions.

**Workshops usually do not foresee the submission of abstracts, and a detailed program, but for this particular workshop we negotiated to have abstracts (to be submitted to the convener by e-mail before the general deadline of January 10) and titles showing up in the general program.**

We are working hard to make this workshop a scientific event, a breakthrough is stratigraphy, unique occasion to compare the view points of a large intercontinental community of professional stratigraphers, that have the responsibility to create, update, disseminate scientific concepts and their applications.

So, if you have something interesting to present, please submit an abstract in due time (call for papers).

Maria Bianca Cita  
Alberto Riccardi

**ABSTRACT to be submitted to**  
**Maria. Cita@unimi.it**