International Union of Geological Sciences

International Commission on Stratigraphy

International Subcommission on Stratigraphic Classification

ISSC

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NEWSLETTER N. 5

(Circular n. 106)

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CONTENTS

1. EDITORIAL

The first Newletters of ISSC (= Circular n.102), distributed in February 2003 started with a brief history of the Subcommission on Stratigraphic Classification, a history started in 1952, during the International Geological Congress held in Algier when Hollis Hedberg proposed its foundation. Five milestones in the activity of the subcommission were mentioned, the last one being the Workshop on "Post-Hedberg developments in stratigraphic classification" to be held during the 32nd International Geological Congress in Florence.

Now that the Congress is over, the question is: was it really a milestone, a scientific event as I was dreaming it to be?

I am sure that most participants would say yes, and this is what I perceive from the numerous oral or written comments received. For those who were not present, there is a well documented report that cannot reproduce the atmosphere, but provides enough information about the number and quality of participants (at least 46, from 21 countries, including 18 subcommission members, 8 of which were new members, and very active).

We had excellent presentations by Task Group leaders Embry on Sequence Stratigraphy and Strasser on Cyclostratigraphy, and the task groups are shaping up quite well.

We noticed the absence of members of the Executive of the International Commission on Stratigraphy.

We started to create a stable structure with members being permanent liaisons with national bodies such as national or multinational Stratigraphic Commissions, Geological Surveys, Scientific Academies.We need to be sure that the various recommendations or decisions taken in an open, democratic style are well received, and we also need and want to know which are the reactions in the various countries.

Other liaisons are being established with the various ICS subcommissions, because we need a better communication in order to avoid too fast and poorly discussed approval of GSSP as it happened in the last few years.

Past vice chairman Alberto Riccardi will represent ISSC at the announced Penrose Conference on Chronostratigraphy to be held in Graz next summer.

It is quite gratifying to see so many results obtained in just one day! And - above all - we have a final goal to reach prior to the next IGC to be held in Oslo four years from now.

My message at the end of the meeting was LET US WORK AS A TEAM!

To do team work we need a team and we need a leader.

To navigate we need an elm and we need sails. But - first of all - we have to know where to go.

THE FINAL GOAL

We have a goal: a new edition of an internationally agreed-upon guide to stratigraphic classification. According to me, the Guide should be simple, user's friendly, well illustrated, documented by real examples from all over the world.

We have four years ahead of us to complete the work, including publication. We may start discussing from now on (from Newsletter n.6)

THE TARGET
THE OUTLINE (= chapters of the guide)
THE APPOINTMENT OF RESPONSIBLES for the various chapters

2005 will be dedicated to the planning
2006 to the writing and circulation
2007 to revisions, to publication of some special chapters and further circulation
2008 to publication of the full new guide

Maria Bianca Cita

2. “POST-HEDBERG DEVELOPMENTS IN STRATIGRAPHIC CLASSIFICATION”

WORKSHOP REPORT

The “Post Hedberg Developments in Stratigraphic Classification" workshop (Room 32, August 27, 2004) appeared in the Congress Program in a very cryptic way, being announced just as ISSC Workshop, with no explanation of the acronym.

It has been a very successful, interesting, well attended meeting, a real "scientific event" as we hoped it to be. It lasted the full day, from 9 a.m. to 7 p.m., with only one interruption for lunch time. Participants that signed, and gave their address were 46 (see list below in alphabethic order) from 21 countries.

Asterisks indicate ISSC members, and double asterisks are new members.

Albanesi Guillermo, Argentina
Aubry Marie Pierre, Rutgers, USA
*Berggren William, Rutgers, USA
Bertini Adele, univ. Firenze, Italy
*Carter Robert, Australia
Cassinis Giuseppe, Univ. Pavia, Italy
*Cita Maria Bianca, Univ. Milano, Italy
Conti Alessandra, Univ. Roma, Italy
*Csaszar Geza, ELTE University, Hungary
Dodonov Andrey, Acad. Sci. Russia
**Edwards Lucy, USGS/NACSN, USA
*Embry Ashton, Calgary, Australia
Falorni Paola, Univ. Firenze, Italy
Gardin Silvia, CNRS Paris, France
**Gianolla Piero, Univ. Ferrara, Italy
*Gladenkov Yuri, Acad. Sci. Russia
*Grigelis Algimantas, Lituania
Groppelli Gianluca, CNR Milano, Italy
Haas Janos, Geol. Instit., Budapest, Hungary
Hannah Michael, Wellington, NZ
Hardenbol Jan, GSC inc
*Heckel Phil, Iowa, USA
*Luterbacher Hanspeter, Mus. Geol. Barcelona, Spain
Mancini Ernie, Univ. Alabama, USA
Marino Maria, Univ. Ctania, Italy
Mazzini Menetti, Univ. Firenze, Italy
Melinte Michaela, Nat. Inst. Geol., Romania
**Menning Manfred, GeoFors. Zentrum, Potsdam, Germany
Michailik Josef, Slovak Acad. Sci Bratislava, SK
Molina Eustoquio, Univ. Zaragoza, Spain
**Petrizzo Maria Rose, Univ. Milano, Italy
Petti Fabio, Univ. Roma, Italy
Pichezzi Rita, APAT roma, Italy
Picotti Vincenzo, Univ. Bologna, italy
**Piller Werner, Univ. Graz, Austria
Pillola Gian Luigi, Univ. Cagliari, Italy
**Pratt Brian, Univ. Sask, Canada
Rasanen Matti, Univ Tussen, Finlandia
*Riccardi Alberto, Univ. Museo La Plata, Argentina

Ricci Carlo, Univ. Perugia, Italy
Ryan William, Columbia Univ., USA
Schirolli Paolo, Univ. Pavia, Italy
**Strasser Andreas, Univ. Freiburg, Switzerland
Studewcka Isasbara, MEPAS, Polonia
Van Couvering John, Micropress, USA
Yin Hong-fu, STS, China
**Zalasiewicz Jan, Univ. Leicester, USA

Conveners of the Workshop were ISSC Chair Maria Bianca Cita and past-Chairman Alberto Riccardi.

The Workshop program and the abstracts of the Keynote lectures, position papers and free contributions were distributed to all the participants, whereas the reports were brand new.

Cita called to order the meeting and announced that it this is the first workshop ever in the over fifty years long history of the International Subcommission of Stratigraphic Classification, founded by Hollis Hedberg in 1952. So far the activity has always been carried out by correspondence essentially by means of circulars outnumbering 100.

She explains that - being vice-chairman of ISSC, she had to substitute Alberto Riccardi in 2002 when he was elected member of the IUGS Council, since the two positions are incompatible.

Starting from then, a re-organization of ISSC has been accomplished, twelve new members were nominated and accepted, and the plan for the present workshop started to develop. The publication last January of a thought=provoking article by a new ISSC member, who is also chairing the Stratigraphic Commission of U.K., and its dissemination to all ISSC members, contributed to revitalize the stratigraphic community that works on concepts and procedures and to make the subject more attractive. The time allocated to the workshop is certainly too limited to discuss all the items at depth and digest them, but it is sufficient to start working together.

She introduced Alberto Riccardi, past-Chairman of ISSC, from Museo de La Plata and University of La Plata in Argentina who gave an excellent, clear and well documented talk on the development of stratigraphic principles.

POST HEDBERG STRATIGRAPHIC CLASSIFICATION: ORDER OR CHAOS?

A.C. Riccardi
Museo La Plata, Argentina

Since the First International Geological Congress (IGC, 1878) one of the main issues for global geology was to achieve some order in Stratigraphic Classification and Terminology. Only in 1952 (19th IGC) the International Subcommission on Stratigraphy was created, under the leadership of H. Hedberg, to produce an International Stratigraphic Guide (ISG). The Guide, published in 1976, was the result of an international consensus on a set of principles embodied in a simple and readily usable classification and was soon to become a model for most National and Regional Stratigraphic Codes. After one hundred years of work it seemed that the original goal had been achieved. However, already in 1977 oil geologists introduced "sequence stratigraphy", and the 1983 North American Stratigraphic Code included several new categories. Meanwhile, a number of other stratigraphic methodologies began to be applied, e.g. astronomical calibration of sedimentary cycles. In spite of all that the ISG second edition was still restricted to the classical categories accepted in 1976, although with the addition of Magnetostratigraphic and Unconformity-Bounded Units (UBUs). Dissenting views and new methodologies were soon to develop in a more complex panorama. The so called "Lithodemic Units" prompted the use of other

terminology's for non-sedimentary rock bodies. "Allostratigraphic Units" resulted in a still unsettled discussion on their relationship to UBUs and Sequence Stratigraphy. Chronostratigraphic, Chronometric and Geochronologic units were used in the "Geologic Time Scale". This developments were paralleled by the work done by the International Commission on Stratigraphy aimed to achieve a world-wide "chronostratigraphic standardisation" based on "Global Stratotype Sections and Points" (GSSP), for which priority as well as permanence are considered as irrelevant. This "last desideratum", emphasising methodology and where boundaries are tied to ages based on global physical events, is resulting in a series of GSSP defining a scale where the classical time-rock concept becomes redundant and its application a practical problem to be solved. It seems that methodologies and specialised and local interests are prevailing over principles, and the more general problems of the world geological community.

After his presentation, Riccardi had to leave for an IUGS Council meeting, but he came back soon, and took an active part in the rest of the Workshop

Cita then introduced the second speaker Ashton Embry from the Geological Survey of Canada, who has been elected vice-chairman of ISSC and appointed Task Group Leader of Sequence Stratigraphy. Ashton works at the Geological Survey in Calgary, and took an active part in the Hedberg Scientific Conference on Sequence Stratigraphy held in Dallas in August 2001, but was not a member of the previous very large Working Group on Sequence Stratigraphy.

THIRD GENERATION (3G) SEQUENCE STRATIGRAPHY

Ashton Embry
Geological Survey of Canada, 3303 33rd St NW, Calgary, Canada, T2L 2A7

Sequence stratigraphy has become a very popular methodology for establishing a quasi-chronostratigraphic framework to facilitate facies analysis and paleogeographic reconstruction. Currently there is considerable confusion regarding sequence stratigraphic methods and terminology. Thus it is worthwhile to examine the evolution of this stratigraphic discipline from its inception in 1949 to the present day.
First generation (1G) sequence stratigraphy was based on the innovative concepts of Larry Sloss and Harry Wheeler and consisted of the recognition of stratigraphic units, termed sequences, bounded by subaerial unconformities. Unfortunately this methodology resulted in nomenclatural chaos because each time an unconformity disappeared a new set of sequences had to be designated.
Second generation (2G) sequence stratigraphy began in 1977 with the publication of papers by Exxon researchers. This methodology resolved the problem of nomenclatural chaos by extending the sequence boundary basinward along a "correlative conformity". This allowed sequences recognized on the basin margins to be extended over a basin without any nomenclatural change. Further refinements included the recognition of other sequence stratigraphic surfaces and the subdivision of a sequence into systems tracts. This methodology suffered from the application of non-actualistic concepts such as instantaneous base level fall and the use of invisible time surfaces and highly diachronous, facies contacts for unit boundaries. These practices resulted in erroneous interpretations of facies relationships and an unacceptable amount of subjectivity in sequence and systems tract delineation.
Third generation (3G) sequence stratigraphy, which was developed in the 1990s, maintains the main components of the earlier methodologies and avoids the pitfalls that have limited their usefulness. In 3G sequence stratigraphy subaerial unconformities and maximum regressive surfaces are used as sequence boundaries and a sequence is subdivided into a transgressive systems tract and a regressive systems tract by a maximum flooding surface. This objective methodology elevates

sequence stratigraphy to a rigorous scientific discipline that marries inductive observations with theoretical deductions of stratigraphic development during base level change.

Cita then introduces the third speaker Bill Ryan, a well known marine geophysicist, from L-DHEO of Columbia University, who was invited to present two case-studies of deep-sea sequence boundaries calibrated by wells or deep-sea cores that document instantaneous transgression. This may occur in small ocean basins temporarily isolated from the world ocean.

MESSINIAN EROSIONAL SURFACES IN THE MEDITERRANEAN AND NOAH'S FLOOD IN THE BLACK SEA: TWO EXAMPLES OF INSTANTANEOUS TRANSGRESSION AND THEIR SEQUENCE BOUNDARIES

William B. F. Ryan
Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964

Both the Black and the Mediterranean Seas experienced periods of isolation from the external ocean. In the case of the Black Sea, the fall of global sealevel during glacial stages of the late Pleistocene ice-age periodically cut off an exchange of water through the Bosporus Strait with its bedrock sill at -70 m.
Over the past million years the Black Sea has spent approximately 90% of its time as a vast lake with only 8 to 9 brief marine connections at times of global highstand. In the subsurface of the Black Sea continental shelf one observes pervasive erosion surfaces, old shorelines and coastal dunes that lie well below the Bosporus sill. Investigations of sediment cores suggest a swelling of the lake to its spill point in cold climate and a shrinking of the lake below its outlet in warm climate.
The Mediterranean became isolated in the Messinian stage of the Late Miocene when the tectonic shifting of Earth's plates led to a constriction in seaways crossing Spain and Morocco. Sealevel began to drop in the Mediterranean while the Atlantic was still supplying water, but at a rate of delivery that could not keep pace with evaporation. Drawdown commenced first in the most distant eastern Mediterranean and later in the west as the result of intervening sills and differences in surface area and river supply. Drawdown was cyclical and extreme in the Mediterranean and exceeded 2 km, leading to an enormous incision of ancient river valleys and pervasive erosion on all margins.
Drawdown in the Black Sea commonly drained most of the shelf. However, a mid-Pleistocene incision of the Dnieper and Dniester Rivers is observed to a depth of -600 meters in the subsurface of the Urkraine shelf.
In both seas regression was climatically modulated. In the Mediterranean it concentrated salinity, which then deposited halite and anhydrite on shrinking salinas and their sabkha rims in basin centers.
Regression in the Black Sea coincided with the deposition of calcite (Seekride). Both seas experienced very abrupt terminal transgessions once the global ocean breached the sill and flooded the depressed lakes. High-resolution reflection profiles coupled with AMS carbon-14 dates, analyses of faunal assemblages, stable isotopes and sediment physical properties allow the creation of Wheeler diagrams that offer a clear view of sequence boundaries and their evolution. The instantaneous nature of the flooding surfaces in both the Black and Mediterranean Seas is crystal sharp.

Last keynote was postponed to the afternoon, because Strasser had to give a talk in another meeting room.

REPORTS were given by:

(1) Piero Gianolla new ISSC member

See his presentation in Appendix 1

(2) Fabio Petti CARG project on Catologue of the Italian Formation

REPORT ON RESULTS OF THE CARG/CIS PROJECT "CATALOGO DELLE FORMAZIONI GEOLOGICHE ITALIANE" (ITALIAN LEXICON).

Delfrati L., Falorni P., Petti F.M.

The CARG/CIS Project "Catalogo delle Formazioni Geologiche Italiane" (Catalogue of the Italian Geological Formations) is one of the projects connected to the realization of the new Geological Map of Italy on a scale of 1:50.000 (CARG project).

The project was born in 1998 as a consequence of an agreement between the Geological Survey of Italy (APAT – Agency for Environmental Protection and Technical Services) and the CNR (National Research Council). The scientific coordinator of the project is professor Maria Bianca Cita of the University of Milan and president of the Italian Commission on Stratigraphy (CIS) while all the activities carried out are directed by professor Piero Manetti of the University of Florence and director of the CNR-IGG. The scientific referent is the Italian Commission on Stratigraphy (CIS).

The project avails itself of the cooperation of the Departments of Earth Sciences of the Universities of Rome "La Sapienza", Florence and Milan where three different task-groups collect and process data from distinct regions of Italy. The task groups are constituted by dott. Luca Delfrati, dott.sa Paola Falorni, dott. Fabio Massimo Petti, dott. Pasquale Izzo and by the supervisors (prof. Maria Bianca Cita, prof. Ernesto Abbate, prof. Maria Alessandra Conti, prof. Maurizio Gaetani, dott. Gianluca Groppelli). The project are also supervised by two members of the Soil Protection Department of the Agency for Environmental Protection and Technical Services (dott.sa Maria Letizia Pampaloni, dott.sa Rita Maria Pichezzi).

The catalogue is a constantly updated database about geological formations of Italy and it represents the Italian lexicon of the formation names used in the geological literature and in geological maps. Furthermore it turned out to be an important tool for a critical revision of the Italian lithostratigraphy.

The reason that has determined the birth of the project is the considerable growth of formation names in the last fifty years. According to different published censuses (AZZAROLI & CITA, 1969; SERVIZIO GEOLOGICO D'ITALIA 1968, 1969, 1970a, 1970b; CARIMATI et al., 1981) in Italy the number of formation names from 1956 up to now has increased nearly twelve times (Fig.1). Furthermore we have estimated that with an average of ten new names for each new sheet of the Geological Map of Italy 1:50.000 the number could dramatically increase reaching 3500. Considering this scenario the proposal of new lithostratigraphic units needs a strict approach if not this huge number of names will generate trouble not only for the end-user of the maps, but also among regional specialists.

The causes of the current situation are different. Without any doubt the main reasons of this increase are the growth of the knowledge about lithostratigraphy of Italy as well as the introduction of many new names because of the new Geological Map of Italy on a scale of 1:50.000. It is worth to underline that the existence of different schools of thought has also played an important part to get this situation. At least but not last the existing amount of formation names is partly due to the attribution of different names to the same body of rocks.

Consequently the main goal of the project is to come out of this marsh of names trying to simplify the Italian lithostratigraphic nomenclature. The aim of this new Catalogue is also to provide the

Project CARG with a means of reference and immediate consultation regarding the characteristics of recognized units, together with an evaluation of their validity. To achieve this objectives is important primarily to define exhaustively formations, then recognize synonymies and finally clarify both vertical and horizontal boundaries of each units.

Geologic formations are defined using a scheme, represented by a worksheet elaborated by an ad-hoc working-group of the Italian Commission on Stratigraphy following the principles established in the International Stratigraphic Guide, and in the recently published Italian Stratigraphic Guide. The worksheet includes several items such as the name of the formation, the type-section, the type-locality, the vertical and horizontal boundaries, the geological maps in which the formation has been used, the fossiliferous contents, the depositional environment, the structural unit an so on. The catalogue includes both the hardcopy and the electronic version of all the compiled worksheets.

Worksheet elaboration process is complex and consists of different phases. In the first phase worksheets are compiled by the members of the three task-groups who collect data from the literature and from geological maps. The compiled worksheets are therefore reviewed by at least two experts (regional and stratigraphic) chosen by the supervisors. The experts evaluate the completeness of the worksheet in comparison with the existing literature and if the formation fits the Stratigraphic Guide principles. After that, the worksheets are revised, corrected and integrated with the expert suggestions. Subsequently it can be submitted to the Italian Commission on Stratigraphy (CIS) the formalization, the change of rank, or the rejection of the examined unit.

After the examination of the Italian Commission on Stratigraphy the worksheet is completed and according to the Commission advice it will be published on the booklets of the Agency for Environmental Protection and Technical Services (APAT).

*All the worksheets of the data-base are available as PDF files on-line at the web site **www.accordo-carg.it**, operating since 2001. Up to now the web-site has been visited approximately three thousand time. The web-site is continuously updated and includes a search-engine by means of which is possible to search formations selecting a region of Italy or a particular geological time interval. Other search keys are formation name, formation initials (abbreviation), worksheet status, formation status and date when worksheet has been inserted in the databank.*

The on-line databank has been created to provide visibility to the project and to maximize the use of worksheets compiled by task-groups workers, CARG operators and by "volunteers".

The present-day results of the project are the following: we have put on record 736 formations of which 332 are under review, 239 are revised and updated, 19 are related to traditional names while 146 have just been published.

The published products are represented by five issues of the Booklets the Geological Survey of Italy (DELFRATI et al ., 2000, 2002a, 2002b, 2002c, 2003a, 2003b), and by a CD-ROM with worksheets available as PDF files. This latter was distributed to the Italian geologists through the newsletter of the Italian Federation of Earth Sciences (GEOITALIA) that in Italy is the most widespread newsletter in the field of Earth Sciences.

The Catalogue of the Italian Geological formation is an ongoing effort to clarify and simplify the Italian lithostratigraphic nomenclature, but as emerged from this report there is plenty of work to be done for this project. Future goals are different, among which the census of new lithostratigraphic units, the elaboration of regional lithostratigraphic schemes, and as a short term objective the preparation and the publication of a volume covering traditional or well-established names.

In order to obtain new positive results we needs a common involvement and a deep cooperation with the Regional Committees of the CARG, because we are deeply convinced that the outcome of the project is fundamental not only for practical reasons but also to better understand the geology of Italy.

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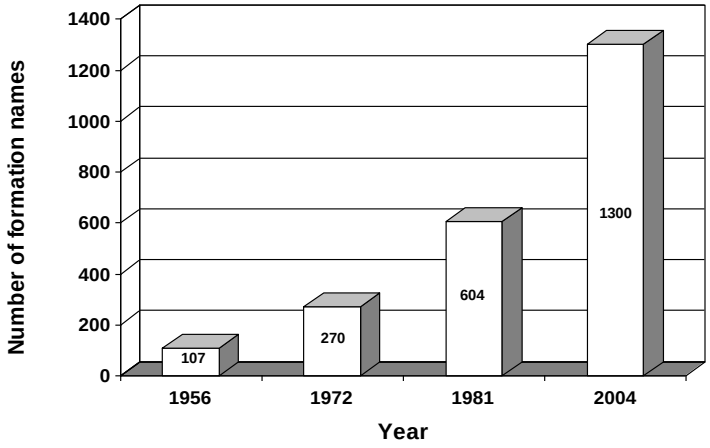

Fig. 1 - Growth of the Italian geologic formation names.

(3) Lucy Edwards new ISSC member, who was co-convener with Jordan and Vai of a Workshop of Unconformity bounded units

REPORT OF WORKSHOP DWO 04 UNCONFORMITY/DISCONTINUITY BOUNDED UNITS

Conveners: Gian Battista Vai, Lucy E. Edwards, and Robert R. Jordan

Formal Presentations

Robert Jordan, Lucy Edwards, Art Donovan, Ashton Embry, Vincenzo Picotti, Federico Lucchi, Gianluca Groppelli, Ernest Mancini, Bill Harris, Gian Battista Vai

Topics

Historical background, North American Stratigraphic Code, Definitions, Stratal Surfaces, Unconformity-ONLY Bounded Surfaces, Quaternary Deposits, Volcanic Deposits, Coastal Plain Deposits, Sets and Subsets, International Stratigraphic Guide, proposal for changes.

Participants

20-30 persons

We agree that:

- *Allostratigraphic units of the North American Code and Unconformity-bounded units of the International Stratigraphic Guide are conceptually the same and have utility.*
- *We observe that utility is currently limited because other surfaces have been excluded.*
- *Utility could be expanded by the incorporation of conformable correlative surfaces into the recognition of allowable boundaires.*
- *There are other surfaces that are potentially useful and are not completely addressed.*
- *We await revision of the International Stratigraphic Guide.*
- *Individuals from the North American Commission on Stratigraphic Nomenclature and from the International Subcommission on Stratigraphic Classification will participate in each other's deliberations.*

After the lunch break the last keynote paper was presented by Andrè Strasser. He was introduced by Cita as an ISSC new member, appointed as leader of the Task Group on Cyclostratigraphy. Strasser, from the University of Freiburg, in Swizerland, was a member of the working group on Cyclostratigraphy appointed by Alberto Riccardi, along with Schwarzacher and Hilgen.

Their activity resulted in two reports disseminated through ISSC circulars and in a SEPM volume just published.

See Strasser's presentation in Appendix 2.

In the following discussion Cita pointed out that the work of the Group is very advanced, recommended that good examples are given and considers a must that Carboniferous cycles are treated. She says that when looking for new members late in 2002, she invited prof. Ramsbottom to join ISSC, but he declined for health problems. Ramsbottom introduced in the literature the term mesothem (as a unit intermediate in rank between synthem and cyclothem) with reference to the Carboniferous stratigraphy. He suggested Riley as a substitute, but apparently Riley is too busy and overcommitted and has no spare time to dedicate to ISSC.

"Old" ISSC member Heckel, who is also member of the Carboniferous Subcommission, might take care of the problem.

Then the various **POSITION PAPERS** were presented, several by new members.

The first was Jan Zalasiewicz, chairman of the British Commission on Stratigraphy whose sense of humour was highly appreciated.

SIMPLIFYING THE STRATIGRAPHY OF TIME: IMPLICATIONS AND PRACTICAL CONSEQUENCES

Jan Zalasiewicz[1]
Alan Smith[2]
Patrick Brenchley[3]
Jane Evans[4]
Robert Knox[4]
Nicholas Riley[4]
Andrew Gale[5, 6]
F. John Gregory[6, 13]
Adrian Rushton[6]
Philip Gibbard[7]
Stephen Hesselbo[8]
John Marshall[9]
Michael Oates[10]
Peter Rawson[11]
Nigel Trewin[12]

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10 BG Exploration and Production Ltd, 100 Thames Valley Park Drive, Reading RG6 1PT, U.K.
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In a recent discussion paper of the Stratigraphy Commission of the Geological Society of London (Zalasiewicz et al. 2004; elaborating an earlier concept of Harland et al., 1990), the following proposals were made:

- *ending the distinction between the dual stratigraphic terminology of time-rock units (of chronostratigraphy) and geologic time units (of geochronology), on the basis that the long-held, but widely misunderstood, distinction between these two essentially parallel time-scales in stratigraphy has been rendered unnecessary by the widespread adoption of the GSSP (=golden spike) principle, in defining intervals of geologic time within rock strata.*
- *using the name "chronostratigraphy" for the definition and application of a hierarchy of eons, eras, periods, epochs and ages. The time units defined by chronostratigraphy in this sense may be qualified by "early" and "late", but not by "lower" and "upper". Although founded within strata, they encompass all rock on Earth*
- *making the terms eonothem, erathem, system, series and stage formally redundant.*

- *allowing the term "geochronology" to revert to its mainstream vernacular use of referring to dating and ordering geological events, particularly by obtaining numerical estimates of time, through radiometric dating, the counting of Milankovitch cycles and so on.*

It was argued that these suggested changes should simplify stratigraphic practice, encompass both stratified and non-stratified rocks, and help geologic understanding, while retaining precision of meaning. What would be the practical consequences of implementing such changes? In the short term, there would certainly be reluctance by many working stratigraphers, possessing long familiarity with the dual terminology, to abandon terms such as "systems" and "series", which are convenient shorthand for referring to the depositional ages of strata. Longer-term, and, more widely, there may be considerable advantages in operating a unified geological time-scale: this would facilitate the correlation of diverse geological phenomena in the construction of increasingly sophisticated (and societally relevant) models of earth history, and aid research between geologists and scientists of other disciplines.

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In the discussion following his presentation it was remarked that the highly provocative paper by Zalasiewicz et al. was first submitted to the Royal Society, that turned it down. Then it was submitted to, and printed in the american GEOLOGY, notwithstanding the recommendation for REJECTION made by Berggren, who complained for that as well as for the publication (in Europe, by an Elsevier Journal) of an other highly provocative paper by an american scientist (Steve Walsh) dealing with stratigraphic classification concepts, that he recommended for REJECTION.

A position paper by the North American Commission on Stratigraphic Nomenclature (NASCN) was presented by new member Lucy Edwards

REGIONAL STRATIGRAPHIC COMMISSIONS: TESTING GROUNDS FOR NEW AVENUES IN STRATIGRAPHIC CONCEPTS

Randall C. Orndorff, Lucy E. Edwards, R. Michael Easton, Brian R. Pratt, and Ismael Ferrusquía-Villafranca

The North American Commission on Stratigraphic Nomenclature (NACSN) consists of about two dozen stratigraphers from Canada, Mexico, and the United States who meet annually to review and develop statements of stratigraphic principles, recommend procedures applicable to classification and nomenclature of stratigraphic and related units, review problems in classifying and naming stratigraphic and related units, and formulate expressions of judgment on these matters. The NACSN actively seeks input from the North American geological community, and it considers and amends the North American Stratigraphic Code to reflect changes in the discipline of stratigraphy. The NACSN, like other regional stratigraphic commissions, considers itself complementary to the International Subcommission on Stratigraphic Classification. Regional codes serve the geological community as a means to test new ideas in stratigraphic terminology and nomenclature. The recent publication by the Stratigraphy Commission of the Geological Society of London (Zalasiewicz et al., 2004, Geology, v. 32, p. 1-4) on geochronology, geochronometry, and chronostratigraphy is a good example of the airing of new ideas, with the stated goal of stimulating discussion prior to

considering formal recommendations. The NACSN has not yet officially considered this new publication, but recent past Chairmen and the present Chairman of the NACSN want to note that the NACSN is aware of, and has had recent discussions of the potential confusion in the usage of the words geochronology, geochronometry, and chronostratigraphy. The NACSN recognizes that the confusion is real andneeds to be addressed. The comments of Zalasiewicz et al. (2004) are most welcome as they will certainly encourage discussion. We note that the terminology for time and rocks in the pre-Phanerozoic should be added to any discussion, as should the concepts of chron and chronozone.

New member Manfred Menning from from Potsdam (Germany) showed and commented two very complex tables summarizing the stratigraphy of Germany

DUAL LITHOSTRATIGRAPHY IN THE STRATIGRAPHIC TABLE OF GERMANY 2002: LITHOFACIES AND MARKER STRATIGRAPHY IN THE CLASSIC ZECHSTEIN AND GERMANIC TRIAS

Menning, M., Etzold, A., Hagdorn, H., Käding, K.-Ch., Lepper, J., Lutz, M. & Nitsch, E.

The Stratigraphic Table of Germany 2002 (STD 2002) is based on a dual lithostratigraphic subdivision for the Zechstein Group and the Germanic Trias Supergroup. 30 formations are defined mainly by their lithofacies, whereas 29 Folgen are distinguished from each other using quasi-isochronous markers:

	Folge	*rock type*	*colour*	*unconformities*
Keuper	*k1 - k6*	*clastics > carb.*	*multi-coloured*	*most significant*
Muschelkalk	*m1 - m9*	*carbonates*	*grey*	*minor*
Buntsandstein	*s1 - s7*	*clastics*	*red >> grey*	*significant*
Zechstein	*z1 - z7*	*evaporites*	*grey > red*	*minor*

The basic units of lithofacies-stratigraphy, the formations of the International Stratigraphic Guide, are defined as largely homogeneous lithofacies bodies; as such they have a limited lateral extent. The basic units of marker stratigraphy (allostratigraphy) are synthems, alloformations, marker formations, summarized in the STD 2002 as Folgen. Allostratigraphic units have been deposited in a given interval of time over large areas – indeed over whole basins. In the Central European Basin they are bounded by quasi-isochronous markers and bounding surfaces in variable rock types.
Formations and Folgen represent different, but complementary views of the same rock pile. Quasi isochronous Folgen boundaries may cross diachronous formation boundaries. An allostratigraphic unit can be recognized only where both of its bounding marker surfaces are developed and can be recognized. Lithofacies-stratigraphy and allostratigraphy should be used together wherever high resolution biostratigraphy is either missing or is not fully available to the geologist in the field.
Lithostratigraphy sensu lato, using lithologic characteristics should be subdivided into:
a) lithofacies-stratigraphy (lithostratigraphy sensu stricto) using rock composition and other rock properties and
b) allostratigraphy and marker stratigraphy using lithologic discontinuities of large extension, which are the rock record of short-term events or sequences of events (e.g., suitable bedding planes, unconformities).
The dual subdivision of stratigraphic successions into a) lithofacies units and b) quasi-time units facilitates the recognition and model-based prediction of facies variations in space and time. That is important both for practical geological applications and for the understanding of the geological history.

Silvia Gardin from Paris University presented the position of the French Commission on Stratigraphy, chaired by J. Thierry.

GLOBAL STRATIGRAPHY, SIMPLIFIED SUBDIVISIONS, DIVERSITY; CONTRIBUTION TO THE IMPROVEMENT OF THE NOMENCLATURE OF THE UNITS OF THE EARTH HISTORY RESULTING FROM MODERN CONVENTIONS

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The present international nomenclature in English/American recommends a dual hierarchy for the stratigraphical units: rock-units (Erathem, System, Series, Stage) and time units (Era, Period, Epoch, Age) with formal subdivisions into Lower/Upper and Early/Late subunits respectively; the corresponding disciplines are respectively called chronostratigraphy and "geochronology".

In 2004, experience has shown that introducing the dual nomenclature, previously not used in French, did not help in the understanding with non-stratigraphers, nor in teaching, and was not successful either among many stratigraphers.

The recent proposal by the Commission on stratigraphy of the Geological Society of London (2004) to simplify the nomenclature is consistent with the definition of stratigraphic units using Global Stratotype Section and Points (GSSPs) and is favourably considered.

Our colleagues would favour the hierarchy Era, Period, Epoch, Age, and early/late subdivisions. It is argued that the more simple hierarchy Era, System, Stage would be more efficient and these names are favoured by French speaking stratigraphers. These were the geological terms used at the beginning of the stratigraphical knowledge in many languages (including French, German, Italian, Spanish). The major reason to favour his hierarchy is not that its traditional use in such or such language. This solution i- never met fundamental problems in the understanding (in fact, less than the use of a dual nomenclature); ii- recommends terms which cannot be confused with vernacular words; iii- acknowledges the fundamental character of the stratigraphical time i.e. that the geological history is essentially read from bottom to top in rocks.

We agree that continuity in the record where GSSPs are defined (at the scale of our present knowledge) allows GSSP to designate an interstage boundary (for instance: the Campanian-Maastrichtian boundary) better than the base of the stage above (the base of the Maastrichtian).

However, the French-speaking stratigraphers would add that they do not support the fact that a single GSSP defines a stratigraphical unit. Definition of a stage needs the definition of its two boundaries in addition to a name for its designation. This name is derived from an historical stage which documents its general content. In this sense, it is recommmended to keep some significance to these historical definitions. On the other hand, it is agreed that the boundary between two stages must be made the most efficient possible in the light of our present knowledge and slight change in the content of historicl stages may be accepted.

Finally, the concept of GSSP cannot be used for definition of all units of the geological calendar. For the Precambrian time, conventional numerical ages should replace GSSPs as is presently recommended by ICS; for the Quaternary (or Plio-Quaternary) time one does not need conventional stages; to our opinion, each stratigraphical tool is able to subdivide the history in particular units and a common language is reached by the simple fact that all these kinds of unit (geochemical, biostratigraphic, lithological, climatic, magnetostratigraphic, man artifacts) can be precisely correlated between them and that their numerical age is commonly well known.

We would support discussion and decision of the Subcommission on Stratigraphic Classification along the above suggested lines.

In the following discussion it was made clear that the distinction between lower, middle and upper versus early, mid and late recommended by the international guides and by international journals in reality is only followed in english-speaking countries and/or journals, since the corresponding terms for early or late are never ever used in french, or italian, or russian.

The last two POSITION PAPERS were presented by "old" members of the Subcommission Algimantas Grigelis from Lithuania and Yuri Gladenkov from the Russian Academy of Sciences, both being supported by national stratigraphic guides or codes authored by them, and officially used in their countries.

LITHUANIAN STRATIGRAPHIC GUIDE AND REGIONAL STRATIGRAPHIC UNITS

Algimantas Grigelis and Lithuanian Working Group
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Lithuanian Stratigraphic Guide is compiled in 1998-2000, approved by Lithuanian Commission on Stratigraphy on 16 May 2000. Pre-print of the Guide was issued in June 2000, and presented on the ISSC Meeting during the 31st Session of the International Geological Congress in Rio de Janeiro, August 2000. Final Guide version is published in 2002 (Lithuanian Stratigraphic Guide. A.Grigelis, O.Kondratienė, J.Paškevičius, T.Jankauskas, J.Satkūnas; compiled by A.Grigelis. - Vilnius: LGT, 2002. - 163 p., 19 figs., 6 tables. Lith., Engl. - ISBN 9986-623-37-5).

The Guide describes main principles of stratigraphy and contains rules of stratigraphic classification, terminology and nomenclature (Salvador, Amos (Editor), 1994). The Abridged Version of the International Stratigraphic Guide is reproduced within the permission of the IUGS from Episodes, 1999, Vol. 22, No. 4, pp. 255-271. Glossary of stratigraphic terms, wide bibliography and indexes in Lithuanian and English are given as the Supplements. The Guide is adopted to the Lithuanian geology and recommended for use in all geological researches.

*A concept of Lithuanian Stratigraphic Guide is based upon the requirements of the international stratigraphic rules presuming that: * stratigraphic units based on different rock features are independent; * system of mappable units for different scales is necessary, * description of clearly defined boundaries of stratigraphic units has to be made; * stratotypes system of local and regional value has to be established. Objectives of Guide are to standardize nationally acceptable stratigraphic terminology and nomenclature, and to formalize rules of stratigraphic procedure. The hierarchy of stratigraphic units is completed, i.e. global range, regional range, and local range of stratigraphic units is accepted. The main categories of principal stratigraphic unit-terms and its terminology are recommended for use as proposed by the ISG (1994): lithostratigraphic; unconformity-bounded (sequential); biostratigraphic; magnetostratigraphic polarity; other (informal) stratigraphic categories (zone with appropriate prefix); chronostratigraphic. Appropriate Lithuanian terms for the units are proposed and approved.*

Regional Unit-terms and Quaternary Unit-terms were not described in the Second Edition of the International Stratigraphic Guide (1994). However, these terms are absolutely necessary for purposes of geological mapping, all kind of regional and local researches. These terms have been introduced and described in the Lithuanian Stratigraphic Guide.

Regional Unit-terms. The Regional Stage is the basic working unit for regional stratigraphy and mapping. The Stage can be subdivided into substages named "lower", "middle" and/or "upper". The unit-term Regional Superstage is not recommended for use. Regional unit-term the Regional Stage (-Stage with appropriate local geographic name) has been approved instead of former widely used unit-term "Horizon".

The smallest regional stratigraphic unit-term "Regional Bed" is proposed. Regional Bed has been defined as a marker bed of supposed chronostratigraphic value, with recognizable features in the sections along the wide area in the region. This unit is considered as a valuable unit for the paleobasin facies correlation in regional aspect.

There is system of stratotypes and type localities defined.

Quaternary Unit-terms. The hierarchy of unit-terms for the Quaternary stratigraphy has been distinguished taking into account a wide experience of the stratigraphers of the Baltic States. The main principle in subdividing of the Quaternary is based upon the climatostratigraphy concept. The hierarchy and main categories of the Quaternary unit-terms is proposed as follows:

Climatostratigraphic [English]	*[Lithuanian]*	*Lithostratigraphic*	*[Lithuanian]*
System (Period)	*Sistema (periodas)*		
Division (Time)	*Skaidma*		
Subdivision (Time)	*Skirsnis*	*Group*	*Serija*
Step (Glacial or Interglacial) Climatolith (Kryomer or Thermomer)	*Pakopa Klimatolitas*	*Formation*	*Svita*
Stadial (Stadium) (Kryostadial or Thermostadial)	*Stadialas*	*Subformation*	*Posvitė*
Phasial (Phase) (Kryophasial or Thermophasial)	*Fazialas*	*Member*	*Pluoštas*
Oscillation or Chronozone	*Osciliacija*	*Bed (Level)*	*Sluoksnis*

If climatostratigraphic criteria are not possible use due lack of data, lithostratigraphic subdivision has to be applied and lithostratigraphic unit-terms has to be used.

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TOWARDS IMPROVEMENTS OF STRATIGRAPHIC CODES AND GUIDES

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In the course of improvement of the International Stratigraphic Guide (ISG), a need may appear to discuss a number of problems to diminish differences between national codes.

1. Different stratigraphic school [conventionally called "European" (1) and "American" (2)] still define stratigraphy in different ways. The former (1) favors "single stratigraphy" that uses information obtained by numerous methods. The latter (2) divide stratigraphy into several independent stratigraphies (litho-, magneto-, bio- and others).

2 There are slight differences in interpretation of chronostratigraphy. Some (1) believe chronostratigraphic units correspond to rock body formed in certain time interval (what kind of interval is not clear). The others (2) emphasize the historical-geological nature of chronostratigraphic units (the time interval corresponds to certain evolutionary stage of biosphere and stratisphere).

3. Some (1) classify stratigraphic units into principal (chronostratigraphic) and special (according to the method applied). The others (2) do not agree with such classification .

4. In opinion of some stratigraphers (1), first of all Russians, chronostratigraphic units can have global, regional (regional stages, local zones) and local (suites) extent. There is no such hierarchy in the IS Guide (2).

5. Some (1) consider lithostratigraphic units to be valid only in local extent, because lithostratigraphic boundaries may be occasionally diachronous and, in strict sense, these units are not chronostratigraphic ones. Lithostratigraphy is considered to be "prostratigraphy". The others (2) are of half-and-half and even opposite opinion.

6. Some (1) interprete a chronozone (assemblage zone) as a part of stage, whereas the others (2) use it as a boundary or correlation marker. This gives rise to different opinions whether Phanerozoic zonations are necessary or the stage scale is enough.

7. In general, we should proceed from the view that all stratigraphic units (global and regional) must reflect natural evolutionary stages of biosphere and stratisphere. This allows deciphering succession and direction of geological processes and phenomena.

8. It may be expedient to set up a working group on improvement of the International Stratigraphic Guide.

Gladenkov's presentation was the last one, since the last two presentations foreseen by the program were free contributions and both authors (Mancini and van Couvering) withdrew them to leave more time for discussion.

UPPER JURASSIC AND CRETACEOUS TRANSGRESSIVE-REGRESSIVE (T-R) CYCLES, NORTHERN GULF OF MEXICO, USA

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Establishment of a chronostratigraphic framework is fundamental to the correlation of strata and for the interpretation of the geohistory of a basin. For the onshore basins in the northern Gulf of Mexico, an integrated sequence stratigraphic, using transgressive-regressive (T-R) cycles, and biostratigraphic approach has utility as a method for establishing such a framework. Eleven T-R cycles and numerous biozones are recognized in Upper Jurassic and Cretaceous non-marine, coastal and marine shelf strata of basins of the northern Gulf of Mexico. The cycles consist of a transgressive phase (aggrading and backstepping intervals) and a regressive phase (infilling interval). Cycle recognition is based on stratal geometries, the nature of the cycle boundaries, facies stacking patterns and large-scale shifts in major facies belts. Cycles are primarily controlled by the change in accommodation space resulting from stratigraphic base-level changes (eustatic and tectonic effects) and sediment supply. Utilizing this integrated approach, 12 regional unconformities and 11 surfaces of maximum transgression (regional marine flooding surfaces) were identified as major events in the Mesozoic geohistory of the northern Gulf of Mexico region. The surfaces of maximum transgression have potential as events for chronocorrelation.

RASHOMON STRATIGRAPHY: WHICH STAGE TO BELIEVE?

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The stage, described by d'Orbigny as a synoptic worldwide landscape, is the original chronostratigraphic unit. Its modern application, however, is the least consistent of any element in the time scale. In the Cenozoic, where boundary definitions can be projected in a rich context of well-calibrated global models (such as planktonic biozonation, magnetostratigraphy, cyclostratigraphy, and stable isotope curves), the stage functions as an isochronous time-unit. In the Mesozoic and Paleozoic, on the other hand, the stage is functionally a self-defining biostratigraphic unit, and isochrony is not relevant. A second inconsistency is the role of the stage in defining higher units. The logic of hiererachy favors the neo-Hedbergian view, which sees the stage as the only unit that takes its age and duration from the strata. Higher units must therefore consist of stages to be valid. On the other hand, the socalled "pragmatic" view taken by the ICS dismisses the idea of global stages precisely on this basis – that as a strata-defined unit, the stage has little meaning away from its place of origin – and seeks to rheify the higher units directly, according to GSSPs associated with "natural boundaries" that are based on major, and presumably more correlatable changes. The solution to this second inconsistency is obvious: we simply define the beginning of higher units with stages that are based on the desired "natural

boundary". Such stages are not difficult to find, because major changes have strong local effects. We cite as case histories the Pleistocene, Pliocene and Eocene. The first inconsistency is due, of course, to the reduced geochronometric resolution in pre-Cenozoic levels. We therefore see a possible linkage between the first and second pairs of conflicts, in that the "pragmatic" view, with its pessimism about the isochronous correlation of stages, is rooted in the Mesozoic-Paleozoic experience. Cenozoic workers, on the other hand, tend to favor the Hedbergian view.

The **GENERAL DISCUSSION** was lively, friendly and open: Sequence Stratigraphy, Cyclostratigraphy, Unconformity bounded units have to be further discussed and clarified, but Chronostratigraphy has its own problems.

After the various presentations, we may say that two different attitudes are showing up: one tends to simplify the terminology (see Embry, Strasser, Edwards), an other one insists on a more differenciated terminology or even proposes new categories (see Menning, Gladenkov, Grigelis).

No decision was taken and will be taken in the near future, but the open forum approach was successful. and the interactions between new and old members quite interesting.

The final message of ISSC chair (see also EDITORIAL) is:

LET US WORK AS A TEAM!

Our goal is to prepare, and publish, a new version of the Guide. There is plenty of time from now to the next International Geological Congress; but we have to reach a consensus on principles and procedures.

3. ISSC BUSINESS MEETING REPORT

A business meeting of ISSC was planned at the end of the General Discussion following the various presentations of the workshop.

Due to the great interest of the discussion, the meeting did not last long, but was very productive.

A. ISSC MEMBERSHIP

Since the very beginning, ISSC membership differed drastically from that of other subcommissions, and included individual members, organizational members and ex-officio members. One scientist could well be member in two or even three capacities; membership was stable and lasted for decades.

This situation was incompatible with the new statute of ISSC (as published in ISSC Newsletter n.1 (Circular n. 102), February 2003) and a drastic reduction in the number of voting members was required. The distinction between active and less active members helped to solve the dilemma without loosing expertise.

However, the important issue is the national representation, that was at risk with the elimination of organizational members.

Indeed, the fundamental difference between ISSC and other ICS subcommissions is just there: the essential role played by National Stratigraphic Commissions, Geological Surveys, Scientific Academies in spreading the rules of stratigraphic classification.

This big problem will be overcome by appointing ISSC members as LIAISONS (see point B)

B. ISSC LIAISONS

Two categories of liaisons are foreseen

- National liaisons
- Structural liaisons

National liaisons: provisional list based on ISSC members present at the workshop (listed alphabetically)

Cita	Italy
Edwards	U.S.A.
Embry	Canada
Gladenkov	Russia
Grigelis	Lithuania
Luterbacher	Spain
Menning	Germany
Piller	Austria
Pratt	U.S.A.
Riccardi	Argentina
Strasser	Swizerland
Zalasiewicz	Great Britain

Suggested (but not present)

Petri	Brazil
Thierry	France

MANDATE: spread the messages plus instructions given by ISSC in their countries, and report on reactions and acceptance status (via correspondence through ISSC Newsletters)

ACTION: the list has to be completed by the end of this year: we are looking for liaisons with China, Japan, Australia, New Zealand, Belgium, the Netherlands, Sweden, Norway, Finland, Poland, Mexico and so on

Structural liaisons

Provisional list based on ISSC members present at the meeting

Riccardi	IUGS
Cita	ICS
Heckel	Carboniferous
Luterbacher	Paleogene
Menning	Permian
Gianolla	Triassic

Suggested (but not present)

Hilgen	Neogene

MANDATE: communicate decisions and orientations of ISSC and report on reactions

ACTION: within the end of this year this list should be completed. ISSC members who are also members of other subcommissions of ICS should volounteer and take the responsability of such a task which is very delicate since the procedures followed for approval of GSSP are such that there is no real possibility to discuss the proposals by the ICS members (= chairmen of the various subcommissions).

The program included the selection of a journal for future publications issued by ISSC activities. Journals proposed were Newsletters on Stratigraphy, Lethaia, Geologica Acta and Stratigraphy.

No decision was made because right now we have nothing ready yet for publication, and also because the new journal directed by van Couvering has been postponed of a few months.

The problem will be reconsidered when the first "chapters" of the future guide, those requiring major revisions (see task groups) will be ready for publication, after circulating within ISSC.

At the end of the meeting van Couvering announced that he proposed to GSA to run a 5-6 days long Penrose Conference on Chronostratigraphy to be organized May-June 2005 in Graz with a scientific committee composed by Aubry, Berggren, Steininger, Piller, Zalasiewicz.

ISSC asks to be invited and Alberto Riccardi, whose strong, solid, classic historic background was recognized, was nominated as official representative of ISSC.

The final words of ISSC chair were of appreciation for the spirit of the workshop, the open attitude, the strong effort to compare different viewpoints.

Her final message (see editorial) was the sense of working AS A TEAM.

4. VISIT TO STENO'S GRAVE

Steno; that is Niels Steensen, better known in Italy as Nicolò Stenone, was born in Denmark in 1638 and died in Germany in 1686. A brilliant scientist specializing in anatomy and later in geology, he spent the best part of his life in Florence at the court of the Medici family. Steno's principle of stratigraphic superposition expressed in his classic (and only) work "De solido intra solidum naturaliter contento" is a milestone in sedimentary geology. Born from a protestant family, when in Florence he converted to the catholic religion, abandoned science, became a bishop and was assigned to a region in northern Germany where he found hostility and died after a short period, before being able to return to Florence, where he was invited by Cosimo de Medici. His body arrived in Florence and was buried in the Cappella de Medici of the famous San Lorenzo Basilica a masterpiece of pure Renaissance style.

Nicolò Stenone has been beatified in 1988, a few years ago, after a very long process, for his high degree of spirituality and his holy life.

A visit to Steno's grave was suggested by Brian Pratt, inspired by the book "The seashell on the Mountaintop" by Alan Cutler, solicited to the Congress organizers and realized on August 25, at 19.00.

A beautiful ceremony was accompanied by the unveiling of a plate by the Archbishop, after several speechs by G.B. Vai, C. Cipriani and the priore of the Basilica.

As mentioned by the Arcbishop in his sermon, the present visit and ceremony testify that -unlike at the times of Steno's life, when he felt he had to abandon Science for Religion - Science and Religion are not mutually exclusive.

The ceremony was announced in the Congress Program as follows:

A TRIBUTE TO STENO

During the 2nd International Geological Congress, Bologna 1881, the participants visited the tomb of Nicholas Steno (Niels Stensen) (1636-1686) in the Basilica of St.Lawrence (San Lorenzo) in Florence to honour one of the founders of modern geology.

In remembrance a plaque was installed in the cloister of the Basilica.

To renew this tribute and stress the link between modern Earth sciences and Steno's anticipatory concepts, a plaque will be unveiled during the Congress in the Chapel where his human remains are kept 123 years after the homage of the Bologna Congress participants.

5. POSTAL BALLOT ON THE QUATERNARY ISSUE

POSITION OF ISSC TOWARDS QUATERNARY ISSUE

The Quatetrnary has been a hot topic prior and during the 32nd IGC, as all the Florence Congress participants are aware.

The time scale published on EPISODES by Gradstein and co-authors does not contain the word Quaternary, and this was strongly criticized by IUGS, which withdrew its logo from the time scale. The term Quaternary was considered obsolete and not precisely defined, notwithstanding in the GEOREF it appears largerly used (281.000 citations).

The situation is even worse after the Congress, since ICS chair and INQUA President, without consulting with the constituent bodies, are appointing one more task force to solve the problem.

I have my own opinions on this issue, and expressed them clearly in the SQS meeting held in Florence on August 20, prior to the opening ceremony. Since I believe that - when there are clearly defined rules - we have to follow them with no exception, I want to know now which is the opinion of each member of our subcommission so that - in case there is a consensus or a very large majority - we may stress our viewpoint in a politically correct manner on a topic which is strictly pertinent to STRATIGRAPHIC CLASSIFICATION.

Please, answer to two simple questions AS SOON AS POSSIBLE

QUESTION N. 1

Do you consider Quaternary a chronostratigraphic unit?

- ☐ YES
- ☐ NO

QUESTION N. 2

If your answer to the above question is yes, which rank would you give to the Quaternary?

- ☐ Erathem
- ☐ System
- ☐ Series
- ☐ Other

Comments.....

NAME_____

DATE _____

6. LETTERS RECEIVED

Hendrik de la Rey Winter winterh@xconnect.co.za (e-mail of September 16, 2004) writes:

Dear ISSC Madam Chair, Maria Bianca Cita, and Esteemed Secretary, Maria Rose Petrizzo, now that the ICS Conference at Florence is over, and I regrettably were unable to participate, I would love to continue once more with the ongoing discussions that Members are having on possible improvements to a future Guide. I have a new e-mail address and designation, in keeping with my position as an independent consultant and professional petroleum geologist keen to see that new definitions and procedures follow or improve upon repeatedly tested positive outcomes for all types of mineral deposits. I believe that the UNFC endeavours [The United Nations Framework Classification for Energy and Mineral Resources. Please ask Mr Slav Slavov for a copy: <mailto: slav.slavov@unece.org>slav.slavov@unece.org] are well advanced in promoting rules of conduct in exploiting Earth resources fairly, safely and with least environmental impact, and that our current deliberations cover the basic or fundamental geological sciences upon which to base best estimates of reserves and resources. I hope that with the help of A. Riccardi our efforts will be brought to the attention of the UNFC leadership.

Please may I receive your impressions/report-back to ISSC when that is distributed. I am intrigued with the American concept of "stratigrahy of time", but believe the inverse to be the solution:--"time spans of strata as seen by the father of stratigraphy --Steno". We see these currently as sequences and their subdivisions. I believe that we can prove them to be a hierarchy of local chronostratigraphic units responding to local tectonics, and that we must find solutions to define and describe them internationally without creating semantic confusion.

Randall C. Orndorff rorndorf@usgs.gov (e-mail of September 8, 2004) writes:

Sounds like you will be quite busy for the next several months, and I understand that you will not be able to attend our meeting. Ashton Embry has already accepted an invitation to join us and will update us on ISSC events and sequence stratigraphy. I am forwarding this email to Norm Lasca so he will be sure to get back to you on the climatostratigraphy issue and note to invite you to our 2005 meeting.

Ashton Embry AEmbry@NRCan.gc.ca (e-mail of September 9, 2004) writes:

I will definitely have a look at using sequence stratigrphy in piggy back basins. Bill Ryan's work certainly shows how fast transgressions can be and that is helpful for promoting the use of the MRS as a very important correlation surface and unit boundary. I have written to Bill and I hope he

and I are able to have further discussions. Randy Orndorff sent me an invitation to the NACSN and I have bought my plane ticket to be in Denver for the meeting on the 7th. Just like last year, I'll

arrive in the morning and go home that evening. It will give me a chance to have some discussions with Don Owen who is on our TG. Of course it is important we back up our stated desire for closer relations between ISSC and NACSN.

There is no doubt that ISSC is more vibrant than it has been for many years, thanks to your efforts.

Felix Gradstein felix.gradstein@nhm.uio.no (e-mail of September 22, 2004) writes:

ICS-INQUA joint task force on the Quaternary by Felix Gradstein and John Clague

Rationale

For over a century, the status and stratigraphic position of the Quaternary have been debated. Authoritative papers on the history of Quaternary, and its recommended stratigraphic definition

and status include Berggren (1998), Lourens et al. (2004), Ogg (2004), and Pillans (2004). The INQUA Executive, through consultation with the Quaternary community in 2004, has found widespread support for defining the Quaternary as a chronostratigraphic unit with a base at 2.6 Ma. As a consequence, ICS and INQUA consider it timely to decide on the stratigraphic meaning of the Quaternary, so that it can be unequivocally placed in the standard global time scale. John Clague, President of INQUA, Felix Gradstein, Chair of ICS, assisted by outgoing IUGS President Ed de Mulder, have agreed that a task force be struck that will make a recommendation to ICS on the definition of the Quaternary in 2005.

Task force

The task force on the Quaternary will comprise members of INQUA and ICS, and will be charged with the single task of defining the Quaternary in a stratigraphic sense. It will formulate a single proposal that will be discussed at the Second ICS Workshop on the Future of Stratigraphy in September 2005 in Leuven, Belgium. This workshop will be attended by the chairs of all Subcommissions of ICS, and the President of the INQUA Commission on Stratigraphy and Geochronology. If the task force recommends definition in a formal chronostratigraphic sense, its proposal will go through the standard ICS consultation, voting, and ratification procedures. The task force will consist of 8 members and will receive advice and input from its wider constituency. The members of the task force are:

Chair: James Gehling, Australia

Vice-Chair: Brad Pillans, Australia

Secretary: James Ogg, USA

Two members of INQUA Commission on Stratigraphy and Geochronology, appointed by the executive of INQUA.

Three members of ICS Subcommission on Quaternary Stratigraphy, appointed by the executive of ICS.

References

Berggen, 1989. The Cenozoic Era: Lyellian (chrono) stratigraphy and nomenclatural reform at the millennium. In: Blundell, D.J. & Scott, A.C. (eds) Lyell: the past is the key to the Present. Geological Society, London, Special Publication 143, 11-132.

Lourens, L., F. Hilgen, N.J. Shackleton, J. Laskar and D. Wilson, 2004. The Neogene Period. In: Gradstein, Ogg and Smith, 2004. Geologic Time Scale 2004. Cambridge University Press.

Ogg, J., 2004. Introduction to concepts and proposed standardization of the term Quaternary. Episodes 27 (2), 125-126.

Pillans, B., 2004. Proposal to redefine the Quaternary. Episodes 27 (2), 127

Yuri B. Glagenkov gladenkov@ginras.ru (e-mail of September 23, 2004)

Dear Maria, I would like to thank you for organizing the splendid meeting in Florence ("Post-Hedberg developments in stratigraphic classification"). It is fine that people think over these problems and outline new approaches to their solution. Naturally there are still differences between geological schools but people's wishes to modify the codes and guides are very important. As I told you, a new version of the Russian Code is under preparation. This is a serious work, in which I am involved and try to use positive experience of the international practice. I would be thankful if you let me know your opinion on my remarks on the stratigraphic problems, which I handed you in Italy together with the book. Probably, some of them may be subjects of future discussions. I hope for the fruitful continuation of the activities of the subcommission.

It is always a pleasure for me to meet you.

7. ANNOUNCEMENT

During the ISSC Workshop in Florence, several copies of the brand new Italian Guide of Stratigraphic classification, and CDs, were distributed to the participants.

The Guide is published by APAT (former Geological Survey) as Quaderni Serie III, vol. 9, pp. 1-155. Written by Daniela Germani and Lucia Angiolini with the supervision of Maria Bianca Cita, this guide results from the activity of the Italian Commission on Stratigraphy under contract with the APAT, that required a revised and modernized version versus that published in 1968 by A. Azzaroli and M. B. Cita.

The text follows in general the International Guide, with some well developed chapters (for instance Magnetostratigraphy, Sequence Stratigraphy, Orbital Stratigraphy) others more synthetic (as Lithostrat or Biostrat).

All the thirteen chapters are illustrated by numerous examples relative to italian stratigraphic successions.

ISSC members interested to receive the Guide should contact Dr. Maria Letizia Pampaloni (marialetizia.pampaloni@apat.it) or they can download from the website http://www.accordo-carg.it

8. PUBLICATIONS RECEIVED

Coccioni R., Galeotti S. and Lirer F. (editors) 2004. Proceedings of the First Italian meeting on Environmental Micropaleontology. Grzybowski Foundation special Publication No. 9.

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Germani D., Angiolini L., Cita M. B., and Commissione Italiana di stratigrafia della Societa' Geologica Italiana 2003. Guida italiana alla classificazione e alla terminologia stratigrafica. Quaderni serie III, vol. 9.

Gladenkov Yu. B., 2001. A problem of elaboration of refined stratigraphic schemes at the background of recent tendencies in stratigraphy. In: Towars detailed strtaigraphic schemes and paleogeographic reconstructions Gladenkov Yu. B. and Kuznetsova K. I. (Editors), GEOS, 2001, p. 9-20.

Gladenkov Yu. B., 2004. Biosphere stratigraphy (Stratigraphic Problems in the early XXI Century). GEOS, Transaction of GIN RAS, vol. 551, pp. 120.

Gradstein F. M., Ogg J. G., Smith A. G., Bleeker W. and Lourens L. J., 2004. A new Geologic Time Scale with special reference to Precambrian and Neogene. Episodes, vol. 27, n. 2, p. 83-100.

Setembrino Petri, 2004. Problems in the utilization of the Brazilian code of stratigraphic nomenclature as related to modern researches. Manuscript.

Zhamoida A. I., 2004. Some key problems of the International Stratigraphic Scale.VSEGEI Press, St. Petersburg.

URGENT ITEMS FOR ISSC MEMBERS

1. ANSWER TO THE POSTAL BALLOT
(see page 22)

2. VOLOUNTEER AS A NATIONAL LIAISON, IF APPROPRIATE
(see page 19)

3. VOLOUNTEER AS A STRUCTURAL LIAISON, IF YOU ARE ALSO A MEMBER OF ANOTHER SUBCOMMISSION OF ICS
(see page 20)