International Union of Geological Sciences

International Commission on Stratigraphy

International Subcommission on Stratigraphic Classification

ISSC

www.geocities.com/issc_arg

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NEWSLETTER N. 8

(Circular n. 109)

October 2005

CONTENTS

1. EDITORIAL

Newsletter n. 8 starts a new phase of our activity, with a preliminary outline of a chapter prepared for our future guide by the task group on the highly controversial theme of sequence stratigraphy (see page), with a new working group appointed on the fundamental, traditional but conceptually strongly debated in the last few years (months?) theme of chronostratigraphy (see page) and a lot of expectation for the outcome of the cyclostratigraphy chapter.

A large part of this issue is dedicated to the general assembly of ICS in Leuven (September 1-5) and to its outcomes (see page 2).

During the excursion I received a cultural shock, after visiting under the excellent guidance of our belgian hosts and collegues Vanderberghe and Bultynck (past chairman of the Devonian Subcommission). We explored the Maastrichtian at Maastricht, Visean at Visé, Namurian at Namur, Dinatian at Dinant, Givetian at Givet…. Well, none of these superclassical localities was selected as standard for the stage where from the name derives.

All the Belgian coal mines have been closed; no more mining activity. Steel industry, strictly related to coal minig in the past, decreased its importance, 75% of the energy produced in Belgium now derives from nuclear power plants (85% in France). The last coal mine of the famous Rhur Basin in Germany was closed two years ago. Nuclear waste is nowdays a major environmental problem, and geologists are involved in the process.

Due to terrosism Bruxelles airport, a large one but certainly not the largest in Europe, employs 600 persons in the security staff!.

We live in a post-industrial era.

In this new world of the third millennium, which is the role played by stratigraphy, that used to be the core business of geology since the early days of this science?

Well, this was the title of a workshop I organized on September 19-20 in Spoleto, under the auspices of FIST (Italian Federation of Earth Sciences) and of the Italian Commission on Stratigraphy, with over one hundred participants, a number of well organized presentations on GSSPs, guidelines and lexicons related to mapping activities, and to the hot theme of Quaternary strtaigraphy, lively discussions and a proactive attitude, the meeting was generally considered very successful and showed beyond any doubt that stratigraphy is not dead, but still well alive (see page 15).

Next deadline for me is a kind of “performance evaluation” committee of IUGS officers with interviews in Paris (see page). Hope to survive…

Milan, October 2005

Maria Bianca Cita

2. REPORT ON THE ICS WORKSHOP "NEW DIRECTIONS IN STRATIGRAPHY" ORGANIZED BY STAN FINNEY VICE CHAIR OF ICS

2.1 PROGRAM

Thursday, 1 September

18:00-19:00 Reception at Geology & Geography Department, Katholieke Universiteit Leuven
19:00- Dinner

Friday, 2 September – 08:30 to 18:00 with lunch at 12:30-14:00 and coffee breaks

08:30-09:45 Meeting Opening
Welcome by Noël Vandenberghe
Program Announcements, organization, logistics (Stan Finney)
Status and Future of ICS (Felix Gradstein)
ICS Business Report (Jim Ogg)
"Stratigraphy" (John Van Couvering)
09:45-12:00 Subcommission Reports
12:00-12:30 Organization of meeting working groups
14:00-15:00 The Quaternary: presentation and discussion of task force recommendations (Jim Gehling, Brad Pillans, Jim Ogg)
15:00-18:00 Working Groups meet to discuss
a) Dual vs. single time scale classification
b) How to make IASG go?
19:00- Dinner

Saturday, 3 September – 08:30 to 18:00 with lunch at 12:30-14:00 and coffee breaks

08:30-09:00 GSSPs: History, mandate, meeting the goal of 2008 (Stan Finney)
09:00-09:30 Comments
09:30-10:00 Working Group Report: Dual vs. single time scale classification
10:00-10:30 Working Group Report: How to make IASG go?
10:30-11:00 Relationship between national stratigraphic commission, ICS and IASG (Tania Koren)
11:00-12:00 The Quaternary Issue – the ICS recommendation
12:00-12:30 Organization of meeting working groups
14:00-15:30 Working groups meet to discuss
a) Unit stratotypes
b) ICS Prizes and Medals
c) Cores as auxiliary or primary GSSPs
d) Quality control on GSSP proposals
15:30-16:00 Working group reports
16:00-17:00 Other ICS matters, projects, procedures, deadlines, questions, issues (Jim Ogg)
17:00-18:00 Summary and Direction (Felix Gradstein)
19:00- Formal Workshop Dinner

Sunday, 4 September – 08:15 Depart on Field Trip

2.2 LIST OF PARTICIPANTS

Felix Gradstein (Oslo, Norway), Chair ICS
Jim Ogg (West Lafayette, USA), Secretary-General ICS
Stan Finney (Long Beach, USA), Vice-Chair ICS
Maria Bianca Cita-Sironi (Milan, Italy), Chair - Subcommission on Stratigraphic Classification
Phillip Gibbard (Cambridge, UK), Chair – Subcommission on Quaternary Stratigraphy
Frederik J. Hilgen (Utrecht, Netherlands), Chair – Subcommission on Neogene Stratigraphy
Eustoquio Molina (Zaragosa, Spain), Chair – Subcommission on Paleogene Stratigraphy
Isabella Premoli Silva (Milan, Italy), Chair – Subcommission on Cretaceous Stratigraphy
Nicol Morton (Vogué, France), Chair - Subcommission on Jurassic Stratigraphy
Marco Balini (Milan, Italy), Vice Chair - Subcommission on Triassic Stratigraphy
Charles Henderson (Calgary, Canada), Chair – Subcommission on Permian Stratigraphy
Philip Heckel (Iowa City, USA), Chair – Subcommission on Carboniferous Stratigraphy

Thomas Becker (Münster, Germany), Chair – Subcommission on Devonian Stratigraphy
Rong Jia-yu (Nanjing, China), Chair – Subcommission on Silurian Stratigraphy
Chen Xu (Nanjing, China), Chair – Subcommission on Ordovician Stratigraphy
Shanchi Peng (Nanjing, China), Chair – Subcommission on Cambrian Stratigraphy
*James Gehling (Adelaide, Australia), Chair – Subcommission on Ediacaran Stratigraphy
Wouter Bleeker (Ottawa, Canada), Chair – Subcommission on Precambrian Stratigraphy
Sorin Filipescu (Cluj-Napoca, Romania), ICS Webmaster
Brad Pillans (Canberra, Australia), President – INQUA Stratigraphy & Chronology Commission
Tatyana Koren (St. Petersburg, Russia), Bureau of Interdepartmental Stratigraphic Committee of Russia
John Van Couvering (New York, USA), Executive Editor – Stratigraphy
Noël Vandenberghe (Leuven, Belgium), Local organizer
Pierre Bultynck (Bruxelles, Belgium), Field Trip Leader
*absent due to illness

2.3 LETTERS PRE-LEUVEN BY FELIX GRADSTEIN AND STAN FINNEY

Date: Fri, 19 Aug 2005
From: f.m.gradstein@nhm.uio.no
Subject: Future Directions in Stratigraphy III - Leuven 2005
To: Participants of ICS Workshop, Leuven, Belgium, 1-5 September 2005

Dear Colleague,
Thanks to the excellent organisation by Stan Finney, and our colleagues in Belgium Noel van den Berghe and Pierre Bultynck, the third ICS workshop on Future Directions in Stratigraphy is shaping up.
On behalf of the ICS executive I express great pleasure that we soon will meet in Leuven to address the vital issues at the heart of ICS.There are fairly standard issues as Stan has laid out, that need your views and directions, but also our future is to be dealt with in a fundamental manner.
After the GSSP's mandate is largely completed in 2008, we will have to go new roads. Some Periods, like Ediacaran and Precambrian have an exciting new science road ahead, and this needs to be stressed. Planetary Stratigraphy, Orbital Tuning of Chronostratigraphy and Isotope Geochronology are other key directions that we have to actively help integrate in the global stratigraphic framework.
I may point out that IUGS this year paid 10.- US per member to ICS. This pityfull amount is going to decrease. With such money we could not even think of having Leuven on the agenda. We make more via industry right now, but we can do even better if we cooperate better and have a tighter organisation.
Hence, one key item is the newly to be formed International Association of Stratigraphic Geologists (IASG), and where ICS will fit in. Although some of you have said that THEIR Subcommission has a life independent of ICS, it is clear that IF ICS has no strength and mandate, the Sc's can forget about it also. Industry likes what ICS does, but we need a better and more clever organisation to funnel that international benefit.
We need to be associated with a top-notch journal, and have electronic publishing with royalties. WWW.Stratigraphy.org is immensely popular (largely thanks to GTS2004 and the GSSP tables), and we have to build on that.
IASG could have regional membership, as strongly advocated for example in Russia. ICS must be politically neutral. Several big organisations, journals and publishers have asked to be formally linked and liaisoned to an IASG. This has to be taken advantage of. One example of such liaison, scientific leadership and visibility is the Joint ICS-IAMG Symposium on 'Astronomical Tuning of the Geologic Time Scale, to be held in Liege (Luik), Belgium from 4-7 September 2006. IAMG is a very well run and very well funded organisation,with a remarkably small membership. We can learn from that.
Also, we need student memberships, more awards (e.g. for single publications), etc. to elevate our already good image, and seed an even better global stratigraphy.
I will be addressing these issues with you, at a time to be organised by Stan.
Please prepare the GSSP etc. items that Stan and Jim have asked you to bring to Leuven, as part of our new products that will be a tangible highlight in Oslo in 2008.
I look very much foreward to meet you in Leuven.
With very best regards
Prof. Felix M. Gradstein, Chair International Commission on Stratigraphy

Date: Tue, 23 Aug 2005
From: Stan Finney <scfinney@csulb.edu> Organizing Chair
Subject: Leuven Workshop
To: Participants of ICS Workshop, Leuven, Belgium, 1-5 September 2005

Soon we will meet in Leuven. All of you have received a message from Felix with regard to the importance and some of the objectives of this meeting. For your information, I attach the Summary and Report from the first such ICS workshop held in Urbino, Italy in 2002. I also attach a Program for the Leuven workshop. You will see that several issues have highest importance. These are: 1) the future of ICS and the evolution out of ICS of an International Association of Stratigraphic Geology, 2) progress towards completion of GSSPs; 3) the Quaternary; and 4) dual versus single nomenclature in the time scale. In addition, there are many more important items on the agenda, there are items that individual participants requested be placed on the program, and there will be opportunities for other matters to be brought up for discussion and consideration.

Subcommission Chairs will be asked to make brief reports, limited to 10 minutes. Except for ISSC, the subcommission reports are to focus on future progress on completing GSSPs. At both Urbino and again in Florence, Subcommission presentations have included detailed reviews of history of work and basis for GSSPs. What we want at Leuven are statements as to the steps each subcommission is taking to finish the job. Please design your presentations accordingly.

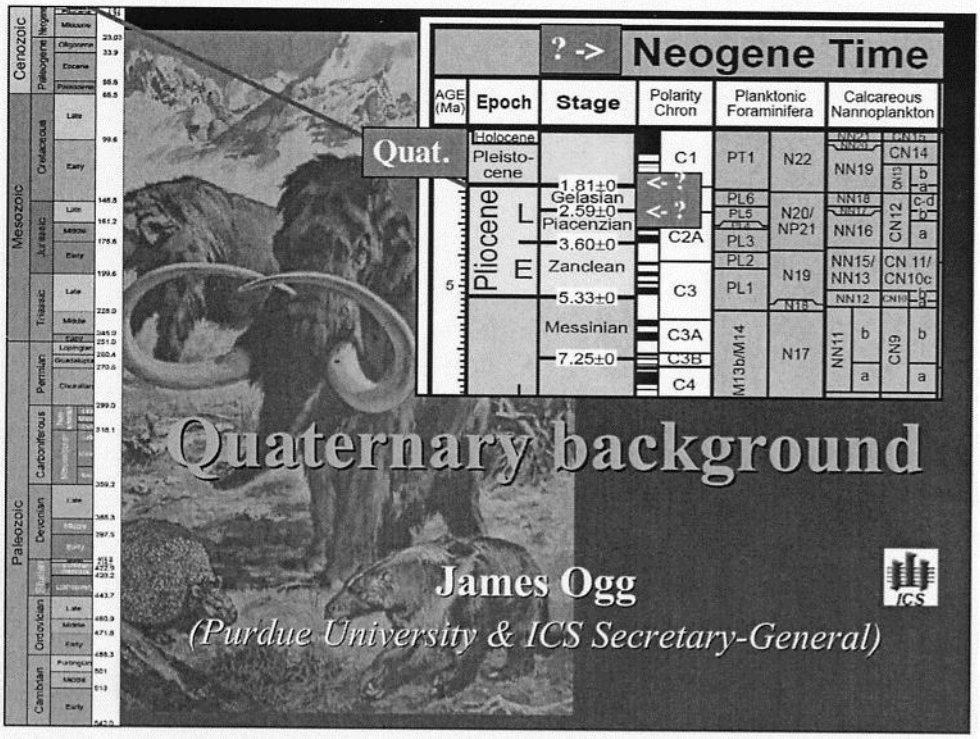
All of you have received information on the Quaternary issue that included material that I sent to you and the task force report distributed by Jim Ogg. Phil Gibbard has also asked that each of you study materials posted on the website of the Quaternary Subcommission (www.quaternary.stratigraphy.org.uk). Please be prepared to understand the issues involved and to participate in the discussion and, if called upon, to make informed decisions.

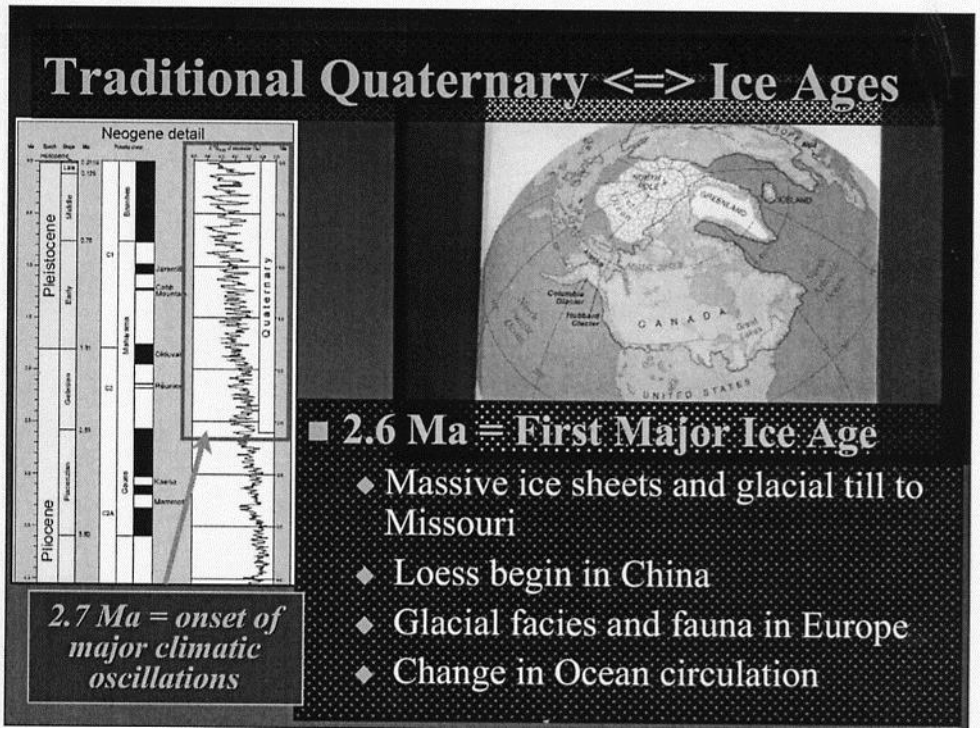
A final topic that might involve much discussion is the issue of dual vs. single time scale classification (or Are chronostratigraphic units redundant?). This idea, reflecting differences in philosophy that were dealt with long ago by ICS and ISSC, has arisen again with the publication of the paper in "Geology" by Zalasiewicz et al in 2004. I attach a copy in pdf format. Other views on this matter have been presented in the past by Walsh and I attach a copy of his 2001 paper in the GSA Bulletin. Extended discussions can also be found in ISSC newsletters no. 5 and no. 6 and in columns in the newsletters of the Palaeontological Association which are available at http://palass.org/pages/jans/jan-column.html . If you wish to participate in the working group on this issue, which will be led by ISSC chair Maria Cita and myself, I ask that you study these documents and, most importantly, that you review the International Stratigraphic Guide, Second Edition by Amos Salvador (ed.) and produced by the ISSC or read the International Stratigraphic Guide - An Abridged Version by M.A. Murphy and A. Salvador, which is available on the ICS website at stratigraphy.org.

I look forward to seeing all of you for dinner in Leuven on the evening of 1 September.
Have a safe journey.

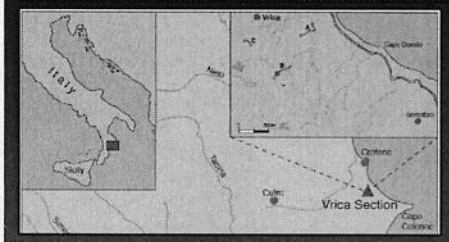
Stan

2.4 QUATERNARY TASK GROUP DOCUMENT presented by Jim Ogg

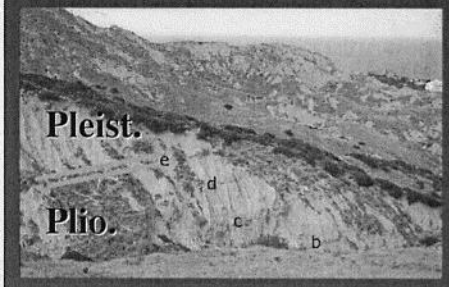




Pleistocene = cooling in Italian Neogene



GSSP = Vrica, Italy = 1.8 Ma

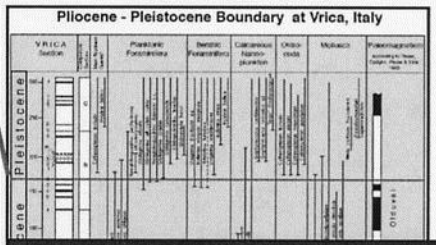


- **Recommendations of Commission appointed to advise on the definition of the Pliocene-Pleistocene boundary; 1 Sept 1948:**
- The **Pliocene-Pleistocene** (Tertiary-Quaternary) boundary should be ***based on changes in marine faunas***, especially in the classic area of marine sedimentation in Italy.
- *.. in order to remove existing ambiguities*, the lower Pleistocene should include as its basal member in the type-area the Calabrian formation (marine) together with its terrestrial (continental) equivalent, the Villafranchian.
- **… the usage would place the boundary at the horizon of the first indication of climate deterioration in the Italian Neogene succession.**

INTERNATIONAL STRATIGRAPHIC CHART

ICS

International Commission on Stratigraphy



"The Pliocene/Pleistocene Boundary is between units of *Series* rank. … Neither the Working Group nor the Subcommission makes any recommendation on the status of *Neogene* and *Quaternary*, which is a separate issue."

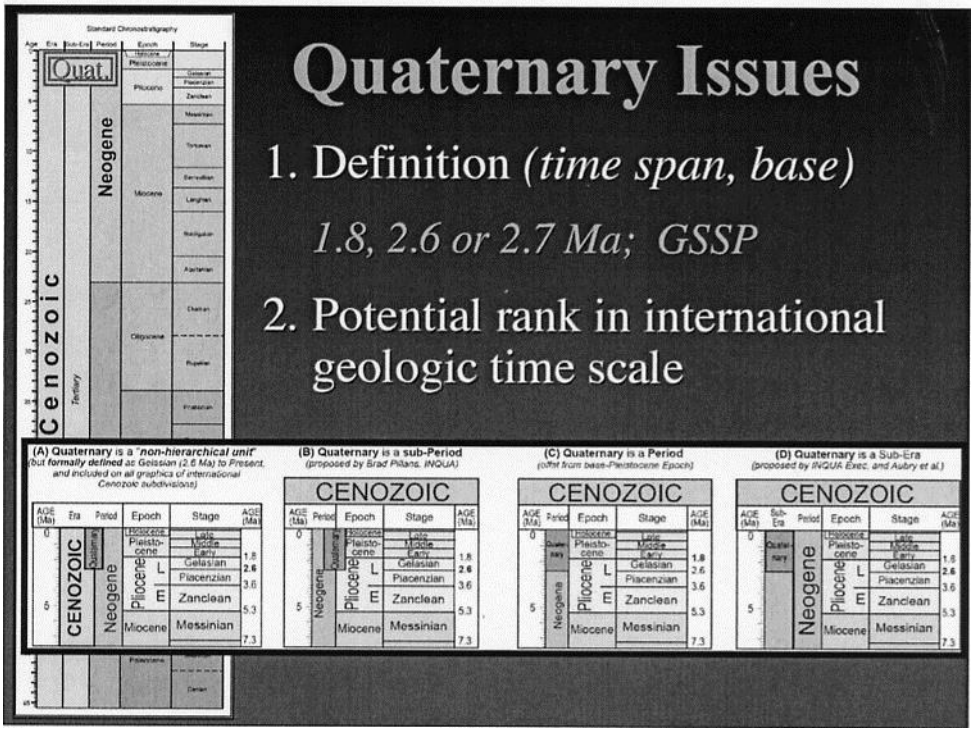
-- R.P. Suggate (25 May, **1984**), "*Proposal for the Definition of the Pliocene/Pleistocene Boundary*" for IUGS ratification

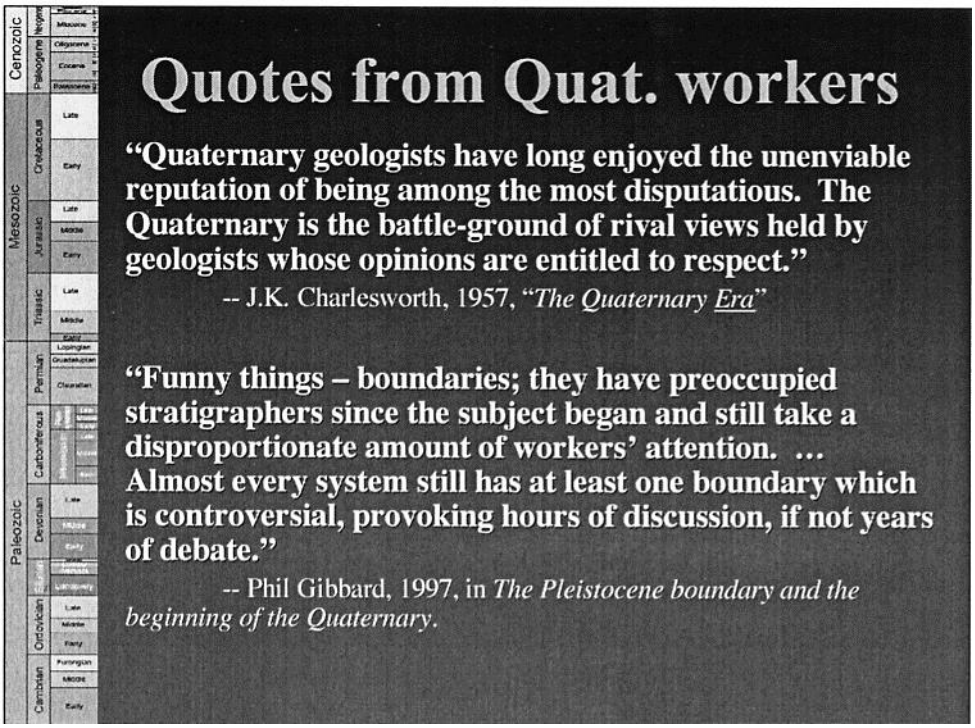
"The subject of defining the Boundary between the Pliocene and Pleistocene was isolated from other more or less related problems, such as the pending definition of the Calabrian, and the status of the *Quaternary* within the chronostratigraphic scale."

-- E. Aguirre and G. Pasini (**1985**, *Episodes* 8: 116), "*The Pliocene-Pleistocene Boundary*"

20 years later …

- The **joint INQUA-ICS Quaternary Task Group** was "*charged with the single task of defining the Quaternary in a stratigraphic sense.*
- *If the task group recommends definition in a formal chronostratigraphic sense, its proposal will go through the standard ICS consultation, voting, and ratification procedures.*"





2.5 REPORT BY STAN FINNEY ON ICS DECISION

International Commission on Stratigraphy Workshop
Leuven, Belgium
1-5 September 2005

Subject: Consideration of recommendation from Joint ICS/INQUA Task Force on Quaternary

Task Force Recommendation to ICS Voting Membership:

1) That the Quaternary is to be recognized as a formal chronostratigraphic/ geochronologic unit.
2) That the lower boundary of the Quaternary will coincide with the base of the Gelasian Stage and thus be defined by the Gelasian GSSP.
3) That the Quaternary will have the rank of either
    a. System/Period and will be at the top of the Neogene System/Period, with its lower boundary marking the top of a shortened Neogene, or
    b. Sub-erathem/Sub-era and will be correlative with the upper part of the Neogene System/Period

Decision by ICS Voting Membership:

Following extended discussion, it was the decision of a substantial majority of the voting membership, evidenced by a show of hands, that the Quaternary be recognized as a formal chronostratigraphic/geochronologic unit with a lower boundary coinciding with the base of the Gelasian Stage and defined by the Gelasian GSSP.

The ICS voting members considered several options for the rank of the Quaternary, and voted on the options by a show of hands. Only one option received a majority and that option was that the Quaternary have the rank of Sub-erathem/Sub-era. Subsequently, a written ballot was held on this single issue, whether or not the Quaternary should have the rank of Sub-erathem/Sub-era. The voting membership consisted of the executive officers of ICS and the chairs of the ICS subcommissions. M. Balini, the vice chair of the Triassic

Subcommission, voted in place of the Subcommission chair M. Orchard who was absent due to illness. The Chair of the Ediacaran Subcommission, J. Gehling, was absent because of illness, and thus was allowed to later submit a vote by e-mail.

The final vote of the ballots was:

YES	12 votes
NO	5 votes
ABSTAIN	1 vote

Thus, a substantial majority of the voting members of the International Commission on Stratigraphy favors the recommendation that the Quaternary has the rank Sub-erathem/Sub-era with its lower boundary at the base of the Gelasian Stage. With this definition the Quaternary Sub-erathem/Sub-era is correlative with the upper part of the Neogene System/Period.

Record of votes and comments submitted with ballots:

Gradstein, F. (Chair - ICS) YES

No comment

Ogg, J. (Secretary - ICS) YES

This will satisfy the needs, desires, and current usage of most stratigraphers. It also allows informal use of "Tertiary" (e.g. K/T boundary), as it is used by many geologists and geological surveys. The Neogene is preserved as it has been used by marine paleontologists for 20 years.

Finney, S. (Vice Chair - ICS) YES

This is the only solution that satisfies the different desires of two major groups of stratigraphers: the Quaternary geologists primarily working with the non-marine record who prefer the Quaternary and the marine stratigraphers who prefer the Neogene.

Bleeker, W. (Chair – Precambrian Subcommission) YES

This is a reasonable compromise that retains the Quaternary at a major formal rank in the Cenozoic time scale and recognizes the fundamentally different approaches, practices, and methodologies in the terrestrial and marine realms that led to this conflict in the first place. It is elegant in the sense that it also allows for reintroduction of the Tertiary (perhaps informal?) at a similar level of sub-era, in the sense of the time interval lasting from the K-T boundary to the onset of major glaciation in the northern hemisphere. There is a large geological constituancy and many thousands of geological maps who use the term Tertiary in that general sense. The Sub-era solution thus allows for preservation of widely used terms with important historical contexts. Eventhough some of the underlying concepts may have changed, I view the preservation of these terms as a positive aspect rather than a distraction.

Gehling, J. (Chair – Ediacaran Subcommission) YES

I can see no objection to making the Tertiary the preceding Sub-Era of the Cenozoic. The establishment of this parallel nomenclature of non-coincident boundaries between sub-eras, period and epochs will, in time, allow common usage to determine the most utilitarian means of grouping stages as the functional biostratigraphic divisions of geologic time. In principle the Quaternary and Tertiary are outmoded names like the Primary and Secondary. If they prevail as sub-eras it will be at the demise of the Paleogene and Neogene. However, the periods and epochs are more likely to prevail as providing two ranks between era and stage.

Peng Shanchi (Chair – Cambrian Subcommission) NO

As Quaternary is a long-used period, I prefer to accept that Quaternary is a period that follows upon Neogene. I don't think Quaternary is a good choice as a Sub-era.

Chen Xu (Chair – Ordovician Subcommission) NO

Quaternary is a period that follows upon the Neogene. I do not agree with Quaternary being a Sub-era.

Rong Jiayu (Chair – Silurian Subcommission) NO

Quaternary is a period that follows upon the Neogene. It is useless if it has the rank of Sub-era.

Becker, T.R. (Chair – Devonian Subcommission) ABSTAIN

I strongly believe that the Quaternary should be defined as a Period/System but status as a Sub-era/Sub-erathem is just tolerable, but not really desirable. If the Quaternary is defined as a Sub-era, the Tertiary should be re-installed as a Sub-era too. Also, the base of the Pleistocene should be at the same level as the base of the Quaternary.

Heckel, P. (Chair – Carboniferous Subcommission) YES

This is the best compromise that will seriously alienate the fewest number of interested scientists.

Henderson, C. (Chair – Permian Subcommission) NO

I equate the removal of the Tertiary as a modernization of our time scale and its addition to precede the sub-era Quaternary is a step back-word. I am in favour of adding the Quaternary back into our scale, but I feel that it is wrong for a sub-era (sub-erathem) boundary to not coincide with either a period/system or epoch/series boundary. This situation is occurring because we are mixing marine and continental signals.

Balini, M. (Vice Chair – Triassic Subcommission) YES

This is a compromise solution with pros and cons. One Pro is the possibility to reintroduce the Tertiary. As Era is more defined on the basis of major changes in the history of life on Earth, the Sub-era rank seems to be appropriate, notwithstanding its short duration.

Morton, N. (Chair – Jurassic Subcommission) YES

I'm very concerned that this scheme means that one stage (Gelasian) is in both Pliocene + Neogene and Quaternary. It will be the only chronostratigraphic unit with this ambiguity.

Primoli Silva, I. (Chair – Cretaceous Subcommission) YES

I vote in favor of keeping alive the Quaternary at the rank of Sub-erathem/Sub-era. The reintroduction of the Tertiary should be the following step.

Molina, E. (Chair – Paleogene Subcommission) YES

I suppose that if the Quaternary is accepted as a Sub-era, also the Tertiary is automatically a Sub-era.

Hilgen, F. (Chair – Neogene Subcommission) YES

This is the best compromise solution available that might be acceptable for both the Quaternary and Neogene communities as well as for the broader stratigraphic communities. It is supported by the majority of SNS members that responded the SNS questionnaire.

Gibbard, P. (Chair – Quaternary Subcommission) NO

The Quaternary should be a full period/system in status above the Neogene. The Neogene should not continue to the present day.

Cita, M.B. (Chair – Stratigraphic Classification Subcommission) YES

This is a compromise solution that does not satisfy the basic rules of chronostratigraphy and does not reflect the historical evolution of thinking. I do hope that in future years the problem will be re-visited with a better understanding.

2.6 COMMENTS BY M. B. CITA

The Leuven workshop of ICS on "New directions in Stratigraphy" organized by Stan Finney and funded by ICS not with the contribution given by IUGS, which was never been so meager, but with money derived by the royalties of the 2004 Time Scale, has been very useful, a good meeting. To stay together not only during the formal presentations, but in the same hotel, at the restaurant, during the excursion allows to be acquainted with each other and to better understand scientific, political and management problems.

Money is money, and this kind of meeting is certainly very important to keep together the Internation Commission on Stratigraphy now in a critical moment of its existence. In comparison to the previous Urbino workshop (the first of this kind), a big change was noticed, a more complete representation of the various subcommissions, a fundamental change in membership, with many young, excellent, well motivated scientists, some with an innovative approach to stratigreaphic problems.

Just to mention a couple, Frits Hilgen focussed on astronomical forcing and Wout Bleeker, chair of the resurrected Precambrian Subcommission, who plans to substitute the "virtual" numerical subdivision presently adopted, with numerical but real subdivision of time based on rocks radiometrically dated, identified in the field.

All ICS members were present except for Gehling, chair of the Ediacarian Subcommission who was also chair of the Quaternary Task Group. He has been given the possibility to cast his vote later by mail.

The time allocated to the presentation of a synthetic report by each Subcommission chair was too short. How could one present in a decent way in just ten minutes the activity of a Subcommission that has several GSSPs yet unsettled? Pratically no questions time after the presentations.

I was impressed by the quality and the quantity of the work done by the Chinese scientists (all specialists in conodonts), for the older part of the Phanerozoic. A strong and motivated national support was evident.

My presentation was the last, and I briefly summarized the results of our "Post-Hedberg developments in Stratigraphic Classification" workshop held in Florence 2004, the appointment of Task Groups, the selection of a scientific journal, our plan to proceed step by step and with a bottom-up approach to the creation of a new guide entitled "Stratigraphic Classification: concepts and examples", and also the intention to cooperate to the stabilization of the marine Pleistocene with three stages to be formally defined in the Central Mediterranean area.

Quaternary was the hot topic of the conference and obviously the major concern, because of the 23 voting members of ICS only a few are really familiar with the problems of Quaternary Stratigraphy and with the large and variegated scientific community of INQUA.

The document prepared by the Task Group had been circulated previously and strongly criticized by several scientists.

However, I do not want to continue the "Quaternary war" forever. We (ISSC) expressed formally our views (see Newsletter n. 7), but the ad hoc task group had made up their mind and was apparently impermeable to external suggestions. Numbers are numbers (as I said), and we cannot always win.

The reaction of ICS to the compromise was quite good, as shown by the report distributed by Stan Finney (see page 8). After the formal vote that accepted the compromise with a substantial majority democratically expressed, and motivated, the atmosphere was much better and more relaxed. Even more during the workshop excursion. The feeling was as we had metabolized a strange, illogical decision: that of decoupling the base of the Quaternary from the base of the Pleistocene, against any "common sense" rule.

The basic reasons – not considered by the Task Group – is that continental deposits laid down during the Quaternary are very difficult to be categorized and classified according to the principles

of stratigraphy, which on the other hand can be easily applied to the marine successions. Neither the priniciple of superposition nor that of correlation are applicable. Lithostratigraphy cannot be used , and biostratigraphy is used only in lacustrine deposits or as "mammal ages". Radiometric dating is used whenever possible, but the error limits may exceed the duration of the intervals considered. Magnetostratigraphy and cyclostratigraphy often used in the last several years give acceptable results only in the case the record is continuous, which seldom occurs in continental deposits. Morphostratigraphic units, climatostratigraphic units, ubsus or synthems poorly defined and not standardized are used in mapping and descibing Quaternary continental deposits. No way to find a common language. This is the message I transferred to the Spoleto workshop of 19-20 September (see page 15) .

During the discussion in Leuven I expressed the intention of the new Italian Commission on stratigraphy that is now stemming from SGI, SPI and AIQUA (see page)

2.7 QUOTABLE QUOTES

STAN FINNEY

"Nanjing and Milano mafia"

Because Subcommissions chairs of the Cambrian, Ordovician and Silurian were from the same institution (Academy of Sciences of Nanjing, China) and M. B. Cita (ISSC), Isabella Premoli Silva (SCS) and Marco Balini (Triassic vice-chair) were also from the same deprtment of Milano University.

"global species" expression used for an Ordovician Graptolite that seems to have a worldwide distribution.

PHIL GIBBARD

"In this part of the world the Quaternary begins at 2.6 My",
"do not use recent for modern sediments", "this is forbidden"

NICOL MORTON

"Stratigraphy is pragmatic, it is not dogmatic"

MARIA BIANCA CITA

"numbers are numbers"; "we cannot always win"

FRITS HILGEN

about the concept of unit stratotype *"empty stages, topless stages"*

THOMAS BECKER

about the protection of GSSPs *"the only GSSP defined in Germany so far is so well protected by the Senckenberg Institute that visitors have to make a special request to get the key. But no request has been submitted in several years"*

WOUT BLEEKER

"geochronology is the science to date the rocks"

3. SEQUENCE STRATIGRAPHY TASK GROUP SUBMITTED BY A. EMBRY IN JULY 2005

Provisional Outline for ISG chapter on "Sequence Stratigraphy"

A. Introduction
    1. General
    2. Seismic stratigraphy and the rise of sequence stratigraphy
    3. Definition of a sequence and sequence stratigraphy
B. Surfaces of Sequence Stratigraphy
    1. Base level models and surfaces generated during changes in base level
    2. Time relationships of sequence stratigraphic surfaces and geohistory diagrams
    3. Recognizing the start and end of base level fall
C. Sequence Stratigraphic Units
    1. Sequence
        a. Transgressive-Regressive sequence
        b. Regressive-Transgressive sequence
        c. Fall-Rise sequence
        d. Rise-Fall sequence
        e. Other types of sequences
    2. Systems tracts
        a. Definitions
        b. Transgressive systems tract
        c. Highstand systems tract
        d. Lowstand systems tract
        e. Forced regressive systems tract
        f. Regressive systems tract
        g. Other types of systems tracts
    3. Parasequence
        a. Definitions
        b. Contacts
        c. Relationship to a sequence
D. Sequence Hierarchies
    1. Criteria for ranking sequence boundaries
    2. Recommended system for a sequence hierarchy
E. Naming sequence stratigraphic units
    1. Sequence
    2. Systems tract
    3. Parasequence
F. Real World Examples
    1. Triassic of the Arctic Islands (clastic ramp setting)
    2. Triassic of Dolomites (carbonate shelf/slope/basin setting)
    3. Permian of the Arctic Islands (carbonate ramp setting)
    4. Upper Cretaceous of Western Canadian Foreland Basin
    5. Tertiary of Svalbard (clastic shelf/slope/basin setting)
    6. Pennsylvanian cyclothems mid-continent USA (tie to cyclostratigraphy)
G. Current problems and pitfalls in sequence stratigraphy
    1. Recognizing sequence and systems tract boundaries in outcrop and wells
    2. Sequence stratigraphy and seismic data

G. Summary

4. CYCLOSTRATIGRAPHY TASK GROUP

Comments on the superoutline prepared by Andreas Strasser and published on ISSC Newsletter n. 7 were received by Winter, Embry, Zalasiewicz, Takayanagi and Csaszar and trasmitted to the author.

In Leuven I met Heckel and Hilgen, who were very interested in the initiative and are expected to illustrate case-studies respectively on the Pennsylvanian of the Mid Interior and on the Mediterranean Neogene by the end of the year.

5. NEW WORKING GROUP ON CHRONOSTRATIGRAPHY

As a result of the Louvain meeting on "New directions in Stratigraphy" and of the discussions during the WG meeting on "single versus dual time scale classification" an ISSC working group was appointed with an invitation mailed from ISSC chair on September 13.

All the scientists invited accepted with enthousiasm.

A brief report on the WG meeting is contained in the enclosed letter of invitation.

From M.B. Cita
To
Ashton Embry <AEmbry@NRCan.gc.ca>
Fritz Hilgen <fhilgen@geo.uu.nl>
Jacques Thierry <jthierry@mail.u-bourgogne.fr>
Jan Zalasiewicz <jaz1@le.ac.uk>
Stan Finney <scfinney@csulb.edu>
Brian Pratt <brian.pratt@usask.ca>

Subject: Appointment of an ISSC Working Group on Chronostratigraphy

Dear collegues and friends,
I am back from the general meeting of ICS in Louvain and want to let you know briefly what has been done for Chronostratigraphy before launching ISSC Newsletter n. 8, now in preparation, where an expanded report on this important meeting will be included. One of the agenda items was on "dual versus single time scale classification". The subject was proposed by ICS vice-chair Stan Finney, and he and I were appointed as conveners of an ad hoc Working Group which was announced prior to the meeting and accompained by a request to read documents as (besides "old" literature) the Zalacsievics et al. 2004 paper, the Newsletter of Paleontology, the Walsh papers of ESR 2005, ISSC Newsletter n. 5 and 6, and the ISG. The subject was considered so interesting that the entire group of 23 scientists (including ICS directory and subcommission chairs from the Precambrian to the Quaternary plus guests John Van Couvering and Brad Pillans) attended and all took an active part in the discussion.
Stan clearly expressed his position in favour of the dual terminology, then I recalled our first ISSC workshop in Firenze, and the various position papers by national and multinational stratigraphic commissions. Then Van Couvering announced that the Penrose Conference proposed to the Geological Society of America on Chronostratigraphy was accepted and will be held in Graz (Austria) in May-June 2006. Then Fritz Hilgen announced (and later presented) a paper – now accepted for publication on ESR- on the "unit stratotype" concept.
Then I expressed my own views that include a) basic chronostratigraphic unit is the stage, that has to be defined by two GSSPs, not just the base, b) chronostratigraphic units of higher rank are based on hierarchic criteria and should be defined along with the stage boundary, not before or independently, c) the smallest chronostratigraphic unit of undefined rank (as stated in ISG) is the chronozone; it is defined in a very ambigous way, and should be redefined with reference to biochronology and geochronology.
When the entire subcommission was requested to express its opinion on the dual versus single time scale classification, the large majority was in favour of keeping the dual one.
I annouced our (ISSC) plan for the new guide, I said that a working group will be appointed and that I thought I had to take the responsability to chair that WG and to prepare a chapter on chronostratigraphy for

the future guide. The composition of the WG that I propose includes, besides myself (chair of ISSC and of the Italian Commission on Stratigraphy)
- Ashton Embry, ISSC vice-chair and task group leader of sequence stratigraphy, participant to the ISSC workshop in Firenze 2004 ,
- Jan Zalasiewicz, ISSC member and chair of UK Stratigraphic Commission, proponent of single category, participant to Firenze 2004 workshop,
- Frits Hilgen, ISSC member and chair of SNS, member of Quaternary task group and of ISSC Cyclostratigraphy task group, proponent of unit stratotype concept,
- Jacques Thierry, ISSC member, WG leader of Biostratigraphy, former chair of Stratigraphic Commission of France,
- Stan Finney, ICS vice-chair (volounteers to take part to Penrose conference in 2006),
- Brian Pratt, ISSC member, past chair of North American Commission on Stratigraphic Nomenclature, participant to Firenze 2004 workshop.

I do hope that you all accept the warm invitation to join the ISSC WG on Chronostratigraphy with the mandate to prepare for the end of 2006 a concise, simple, clear, convincing chapter (review paper) on concepts, definitions, applications, real world examples in Chronostratigraphy intended as a necessary update of the existing ISG. Hope to hear from you soon.
This letter will be disseminated through Newsletter n. 8 next month, and I have to be sure that each of you is willing to take an active part in this new project.

Best regards,
Maria Bianca Cita

6. POST-LEUVEN INITIATIVES ON PLEISTOCENE CHRONOSTRATIGRAPHY

6.1 FOLLOW UP ON PLEISTOCENE STRATIGRAPHY MEDITERRANEAN MARINE STAGES

Date: The, 29 Sept 2005
To: participants to Louvain Meeeting of ICS in Louvain
From: Maria Cita
Re: Follow up on Pleistocene Stratigraphy Mediterranean marine stages

Dear Friends and Collegues,
In Louvain I announced that I was going to propose a threefoold subdivision of the Pleistocene (according to the agreed-upon criteria) based on continuous marine sections from southern Italy and Sicily and on ODP Sites 963 and 964 at a Workshop to be held in Spoleto on September 19-20.
I am now pleased to announce that the workshop went very well, with over one hundred participants and all the protagonists of the high resolution integrated stratigraphy taking an active part both in the data presentation and in the discussions.
Special working groups were appointred a) for the Calabrian and Ionian and b) for the late Pleistocene (Tyrrhenian?) which is the most difficult task, for obvious reasons.
I do hope to be able to put together a short document to be submitted to EPISODES before the end of 2005, in order to cool off the hot atmosphere deriving from the "Quaternary war" and to stabilize the stratigraphy.
May we dare to say "all is well what ends well"????
May I have the comments mailed by Brad Pillans to Amos Salvador on Sept.15?
Best regards to you all

Maria, chair of ISSC

6.2 WORKSHOP IN SPOLETO

La Stratigrafia in Italia Oggi

Spoleto, 19-20 Settembre 2005

Organizzato da

CIS3 - Commissione Italiana di Stratigrafia

Premessa

Il workshop intende fornire un quadro sintetico della situazione italiana riguardo ai problemi internazionali e nazionali della Stratigrafia in generale, della definizione degli stratotipi dei limiti (GSSP), della Stratigrafia legata alla cartografia geologica al 50.000 (escluso il Quaternario) e dei problemi specifici riguardanti i concetti, le definizioni e gli esempi delle successioni marine e continentali del Quaternario italiano.

Natura e Struttura del Workshop

Il Workshop si svolgerà nei due giorni che precedono il V Forum Italiano di Scienze della Terra, il 19 e 20 settembre 2005 a Spoleto.

Il Workshop è aperto a tutti gli studiosi italiani che si occupano di Stratigrafia in tutti i suoi molteplici aspetti. Si presenta come un evento collettivo aperto, e non come una successione di presentazioni isolate. Sono previsti interventi programmati ed alcune relazioni a invito. Sono latresì graditi poster su temi pertinenti.

Notizie pratiche

La partecipazione al workshop non richiede iscrizione, in quanto è gratuita per gli iscritti al V Forum di Scienze della Terra. Per la messa a punto dei dettagli organizzativi vorremmo conoscere il numero dei partecipanti. Preghiamo quindi di voler confermare l'adesione via e-mail all'indirizzo marco.balini@unimi.it, entro la fine luglio 2005.

Negli elenchi seguenti gli asterischi indicano le presentazioni ad invito con abstract consegnato a giugno 2005.

Programma dettagliato

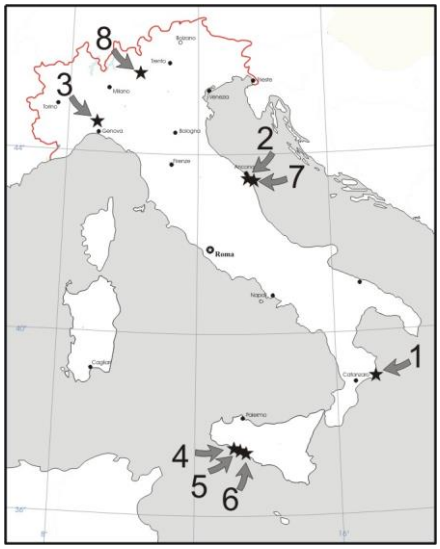
19 settembre 2005, mattina, Sessione 1 - La Commissione Italiana di Stratigrafia.

INTERVENTI PROGRAMMATI

A) Presentazione della Commissione Italiana di Stratigrafia CIS3 e sua composizione. M.B. Cita.

B) GSSP (Global Stratotype Section and Point) definiti in Italia e Geositi: Segnalazione e protezione degli otto GSSP definiti in Italia.

Progressivo	GSSP	Località	Provincia	Regione	Litologia	Setting	Anno
1	Limite Pliocene/Pleistocene	Vrica	Crotone	Calabria	Argille	Calanco	1985
2	Limite Eocene/Oligocene	Massignano	Ancona	Marche	Marne	Pendio	1992
3	Limite Oligocene/Miocene	Carrosio	Alessandria	Piemonte	Marne	Pendio	1996
4	Base Gelasiano	M.S. Nicola, Gela	Agrigento	Sicilia	Argille	Calanco	1997
5	Base Piacenziano	Punta Piccola	Agrigento	Sicilia	Presso sommità Trubi	Presso la spiaggia	1997
6	Limite Miocene/Pliocene, base Zancleano	Eraclea Minoa	Agrigento	Sicilia	Base Trubi	Sulla spiaggia	2000
7	Base Tortoniano	Monte dei Corvi	Ancona	Marche	Marne	Sulla spiaggia	2003
8	Limite Anisico/Ladinico	Bagolino	Brescia	Lombardia	Calcari	Alveo torrente	2005



- **Geositi e GSSP (Global Stratotype Section and Point).** M.B. Cita, S. Iaccarino, R. Coccioni & E. Di Stefano. *

- **GSSP del limite Anisico/Ladinico: Bagolino.** M. Gaetani, M. Balini & A. Nicora.
- **GSSP del Eocene/Oligocene: Massignano.** R. Coccioni & I. Premoli Silva.
- **GSSP del limite Oligocene/Miocene: Carrosio.** S. Iaccarino, R. Gelati & A.M. Borsetti.
- **GSSP della base del Tortoniano: Monte dei Corvi.** L. Montanari, I. Raffi & S. Iaccarino.
- **GSSP Miocene/Pliocene, e base Zancleano**: Eraclea Minoa. E. Di Stefano.
- **GSSP base Piacenziano: Punta Piccola.** E. Di Stefano.
- **GSSP base Gelasiano: Monte S.Nicola.** E. Di Stefano.

- **GSSP limite Pliocene/Pleistocene: Vrica.** G.B. Vai & D. Rio.

Intervallo

- **GSSP in Italia: strategie di conservazione.** M. D'Andrea (APAT).
- **Ricerche in corso in previsione di futuri GSSP.**

C) Nomina degli esperti della CIS3
- Nomina ex officio dei membri di commissioni o sottocommissioni internazionali.
- Esperti regionali per collaborazioni con il progetto CARG.

(gli esperti della stratigrafia del Quaternario verranno presentati nella III sessione del workshop)

D) Discussione generale, con particolare riguardo alla politica per la salvaguardia e conservazione dei GSSP.

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19 settembre 2005, pomeriggio, Sessione 2 - La Stratigrafia nella cartografia geologica italiana alla scala 1:50.000. In collaborazione con l'APAT (CARG).

INTERVENTI PROGRAMMATI
- Attività e ruolo della Commissione Italiana di Stratigrafia nel Progetto CARG. F. Galluzzo.
- Come è stata realizzata l'iniziativa a partire dal 1999. P. Manetti.
- La Guida Italiana alla classificazione ed alla terminologia stratigrafica. APAT, Quaderni serie III, Vol. 9/2003. D. Germani. *****
- Il Catalogo delle Formazioni Italiane. APAT, Quaderni serie III, Vol. 7, fasc.1-4. P. Falorni & F. Petti.

Intervallo

I nomi tradizionali:
- Un esempio classico dell'area dolomitica. C. Neri, P. Gianolla & M. Avanzini. *****
- Gessoso - solfifera, un esempio difficile, M. Roveri.

- Uso e abuso di unità litostratigrafiche nel progetto CARG. M. L. Pampaloni & R. M. Pichezzi. *****
- Correlazione stratigrafica tra successioni alpine utilizzando dati del progetto CARG: problemi e proposte. M. Pantaloni & C. Muraro. *****

Discussione generale e prospettive per il futuro.

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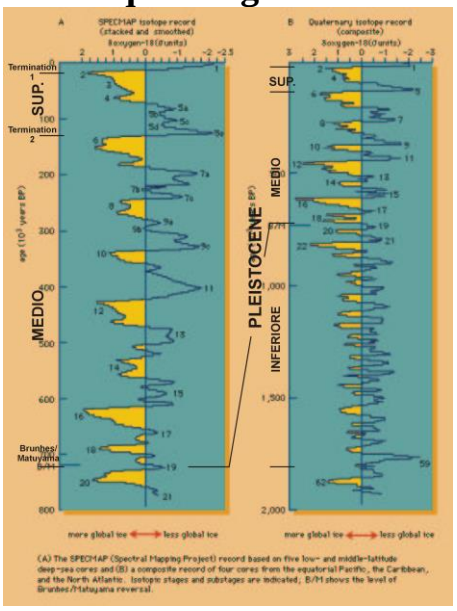
20 settembre 2005, mattina e pomeriggio, Sessione 3 - Il Quaternario.

INTERVENTI PROGRAMMATI

Il quadro generale



- Il caos internazionale riguardante il Quaternario. G. B. Vai.
- L'importanza dell'Italia nella stratigrafia del Quaternario marino e continentale (carrellata delle sezioni tipo). M. B. Cita.
- Il paleomagnetismo, link tra successioni marine e continentali. G. Muttoni.
- La geocronologia del Quaternario mediterraneo (Specmap, sapropels, ciclostratigrafia). D. Rio & C. Corselli.
- Il pozzo ODP 963 nel Canale di Sicilia al largo di Capo Rossello. R. Sprovieri, E. Di Stefano & M. B. Cita.

Intervallo

B) I piani marini del Pleistocene e la stratigrafia integrata

Proposta di piani regionali per il Pleistocene dell'area mediterranea:

Pleistocene superiore=Tirreniano

- Il piano Tirreniano nel Mediterraneo: definizione, utilizzo e riconoscimento nel record marino profondo. Una proposta. M. B. Cita, L. Capotondi & A. Asioli. *
- I terrazzi marini. L. Carobene.
- La fauna tipica di Cala Mosca. C. Spano & P. Carbone.
- Le variazioni della linea di riva collegate alle oscillazioni climatiche: marker stratigrafici. F. Antonioli.
- Studi multidisciplinari sul Pleistocene superiore-Olocene carotati nel Mar Tirreno meridionale, Italia. T. Pescatore et al. *

Pleistocene medio= Ioniano

- Lo Ioniano. N. Ciaranfi.

Pleistocene inferiore=Calabriano

- Il Calabriano. D. Rio, G.B. Vai.

Pausa pranzo

C) Il Quaternario continentale e le unità climatostratigrafiche

- La Climatostratigrafia. G. Orombelli.
- Una discussione critica sullo stato dell'arte del Pleistocene Medio e Superiore in Italia. M. Coltorti.
- Il più recente estremo climatico freddo: l'Ultimo Massimo Glaciale. C. Ravazzi.
- Il record pollinico nelle successioni lacustri dell'Italia centrale. M. Follieri & D. Magri.
- Evoluzione pleistocenica del margine tirrenico dell'Italia centrale tra eustatismo, vulcanismo e tettonica. D. De Rita, M. Fabbri & C. Cimarelli
- Le correlazioni tra Quaternario Marino e Continentale attraverso la stratigrafia sequenziale.
- Correlazioni nel Quaternario dell'Italia Centrale. G. Cavarretta.

Intervallo

D) Nomina esperti del gruppo di lavoro "QUATERNARIO" - CIS3.

E) Discussione generale ed eventuale risoluzione sui piani regionali.

7. PAPERS RECEIVED

METHODOLOGICAL PROBLEMS OF LITHMOLOGY AND SEQUENCE STRATIGRAPHY

Yu. N. Karogodin

United Institute of Geology, Geophysics and Mineralogy, Siberian Division of the RAS, Universitetskii pr. 3, Novosibirsk, 630090, Russia

The paper deals with the concepts of the object and subjects of study of two close scientific schools – lithmology and sequence stratigraphy. The main principles and rules for recognizing the chief object of study are analyzed. Some of the principal terms are defined. It is concluded that, like lithmostratigraphy, sequence stratigraphy is a part of lithmology, a science concerned with rock-layer systems.

Methodology, lithmology, sequence stratigraphy

Russian Geology and Geophysics
Vol. 37, No. 7, pp. 1-8, 1996

Geologiya i Geofizika
UDC (001.4+001.5):(551.26+551.7)

ANALYSIS OF BASIC CONCEPTS AND TERMS OF LITHMOLOGY AND SEQUENCE STRATIGRAPHY

Yu. N. Karogodin
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John. M. Armentrout*
Mobil Exploration and Producing Technical Center, Dallas, Texas 75265-0232, USA

Basic concepts and terms of two scientific trends, developed independently in Russia and abroad, are analyzed. These are lithmology and sequence stratigraphy, related to layered associations, or systems. Groups of terms, reflecting the structure, dynamics, hierarchy and other concepts are considered. The conclusion is made that it is necessary to develop a single conceptual and terminological basis for the science on layered associations as its theoretical groundwork.

Methodology, lithmology, sequence stratigraphy

Russian Geology and Geophysics
Vol. 44, No. 7, pp. 726-738, 2003

Geologiya i Geofizika
UDC 551.7.00133

DISCUSSION

SUITE AS A STRATIGRAPHIC UNIT: PAST, PRESENT, AND FUTURE. SYSTEM ANALYSIS

Yu.N. Karogodin

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3 prosp. Akad. Koptyuga, Novosibirsk, 630090, Russia

The history of the term suite has been traced, from an optional to the fundamental stratigraphic unit. In the absence of certain rules for recognizing suites as lithostratigraphic units, the basin (local, regional) stratigraphy came to a crisis. The overwhelming majority of the suites established in the Mesozoic section of West Siberia cannot fulfill the main, correlating, function of stratigraphic unit. Suites cross other stratal bodies, even themselves. The number of suites snowballs to become information noise. A possible way out of this situation is the use of a system approach, based on the suite as a system, with the resulting principles, requirements, rules, and consequences.

The system approach to recognition of suites drastically reduces their number and provides a safe tool for their unambiguous recognition and tracing (correlation) in the basin section. Any system, including the rock-layered one, is subject to classification, minimization, hierarchic arrangement, etc. according to certain properties.

Suite, stratigraphic unit, cyclite, system-stratigraphic model

Spoleto - GEOITALIA 2005

A Maria Bianca Cita, con grande stima Luigi Carobene