

**INTERNATIONAL SUBCOMMISSION ON
STRATIGRAPHIC CLASSIFICATION (ISSC)**

OF

**IUGS INTERNATIONAL COMMISSION ON
STRATIGRAPHY**

CIRCULAR NO. 91

JULY 5, 1996

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I. MEETING OF THE ISSC AT THE 30th INTERNATIONAL GEOLOGICAL CONGRESS IN BEIJING

The meeting of the ISSC during the 30th International Geological Congress in Beijing has been scheduled to take place from 5:30 to 20:30 p.m. on Thursday, August 8, 1996, in Room A9 of the China World Trade Centre.

I hope that all members of the Subcommittee attending the Congress will be present at the meeting.

The principal purpose of the ISSC meetings at the International Geological Congresses is to provide those members who can be present with an opportunity to review and discuss the ISSC accomplishments since the last International Geological Congress and the plans and objectives for the years until the next Congress. The meetings are also a good occasion to meet and establish personal contacts among members of the Subcommittee attending the meetings.

The meetings are primarily for Members of the Subcommittee, but other interested stratigraphers are welcome to attend. Speakers should identify themselves and their class of membership when they are given the floor. Normally only a minority of the total number of members can be present or represented at the Congress meetings of the Subcommittee. Any matters importantly affecting the Subcommittee as a whole will be discussed freely at these meetings but decisions on such matters must be deferred for a written vote of the entire membership.

The tentative Agenda for the Meeting should be:

- 1) Call to order at 5:45 p.m.
- 2) Register of attendance
- 3) Statement of purpose and rules of meeting
- 4) Report of Chairman for period since last meeting in Kyoto on August 28, 1992 (membership changes, circulars, publications, finances, etc.)
- 5) Announcement of officers for term 1996-2000
- 6) Discussion of procedures, objectives and program of ISSC
 - a. Membership of Subcommittee
 - b. Publication of the Abridged version of the ISG
 - c. Means of promoting compliance of rules on stratigraphic classification
 - d. Organization and activities of the WG on Sequence Stratigraphy
 - e. Plans for working on other possible units of stratigraphic classification (e.g. event stratigraphy, cyclostratigraphy, chemostratigraphy)
 - f. Translation of stratigraphic terms into various languages
- 7) Other
- 8) Adjournment at 8:30 p.m.

If any member of the Subcommittee who plans to attend the meeting would like to discuss other subjects, I would appreciate being advised to that effect as soon as possible so I can include the item or items in the agenda of the meeting.

II. SHORT VERSION OF THE GUIDE

A draft of the complete Short Version of the Guide was prepared by Mike Murphy and included as Appendix B to ISSC Circular No. 88. At that time comments and suggestions were requested. As a result Amos Salvador submitted a proposed revision of the Short Version, which was included as Appendix B to Circular No. 90. More recently Amos Salvador prepared another draft of his previous revision, but some changes to it have been suggested by M. Murphy.

On that basis a final text of the Short Version of the Guide will be included in the next circular for approval by the Subcommittee.

Other comments and suggestions from ISSC members to this matter as presented in circulars 88 and 90 are as follows:

R. A. Cooper

In general I prefer the Murphy version because it is more succinct. The idea was to put out a brief version that would be cheap to produce and be more accessible for students. I see the logic behind the Salvador proposal but it seems to me that there is little point in producing something that is essentially a slightly shortened version of the main Guide. I suppose the worry is that the shortened version might be used (and quoted) by professional geologists in preference to the main Guide. In this case it seems better to have a really shortened version that is obviously not a substitute for the main Guide.

Yu. B. Gladenkov

A short version of the Guide is undoubtedly very useful initiation and the work should be greatly appreciated. However, I have some notes on this version as well as on the Guide, proceeding from the general approach to stratigraphy and its goals. I think the main goal of stratigraphy is to classify rock strata according to their time formation and to elaborate timescales of geological events. In fact, stratigraphy was always “chronostratigraphy” by intention. The data obtained by different methods at the recognition of specific subdivisions (bio-, litho-, magnetic, etc.) are summarized and correlated in its framework. This enables us to distinguish major - general and regional - stratigraphic subdivisions. Virtually, we infer the geological time (absolute and relative) from radiometric and paleontological data only. So, we try to relate geological events, which are marked by litho-, magneto- and other boundaries, to the chronostratigraphic scale. By the way, many of these boundaries are not “stratigraphic” in the strict sense, because they are diachronous (i.e., lithological ones). All this means that there is a single stratigraphy (with chronostratigraphic base) and subdivisions of subglobal and regional scale. I think these considerations should be noted in the Introduction.

J. B. Waterhouse

I favour a very short version, but the Amos Salvador comments do make sense. I have just come across a pathetic ignoring of basic nomenclatural principles It underlies to me how profoundly necessary a guide - indeed a code - is, if anarchy is to be avoided. I wonder therefore - would it be an idea to draft a POSTER, that tersely summarizes basic - very basic principles, and can be mounted in university labs., with reference to the 1994 guide at the bottom.

III. DRAFT OF A POSTER ON GUIDELINES FOR NEW LITHOSTRATIGRAPHIC UNITS

J. Waterhouse suggested preparation of a poster on lithostratigraphic principles. He has prepared a preliminary proposal (see **Appendix A**) to criticize and work on. He sees “it no a large poster, with background colours, may be as a stratigraphic column or an anticline, and a few fossils and minerals depicted in the corners. The included text could be too much, but then it would be easier to delete than to insert”.

Comments and suggestions are welcome.

IV. GUIDELINES FOR GSSP

Appendix A to ISSC Circular No. 88 included a modified version, prepared by M. Murphy, of the original Guidelines published by Cowie et al. (1986, Cour. Forsch.-Inst. Senckenberg 83). At that time, comments and suggestions were requested in order to prepare a version to be submitted to the ICS.

Meanwhile the ICS Bureau had approved a completely new draft of the Guidelines, which was circulated to all ICS subcommissions for their criticism and input. The ICS Bureau draft was included as Appendix C to ISSC Circular 90, together with comments on it by M. Murphy and A. Salvador. A draft on the stratigraphic principles and procedures for selection of stratotypes prepared by A. Salvador was also included as Appendix D to ISSC Circular 90.

As the ICS had requested all comments and suggestions to be sent before September 30, 1995, a questionnaire was included as Appendix E to ISSC Circular 90 in order to arrive at some consensus on the comments and proposals to be submitted to the ICS. Answers to that questionnaire are included as **Appendix B** to this circular.

They were sent to the ICS Chairman, informing that all opinions received from ISSC members on the GSSP Guidelines were coincident in stressing the need to rewrite them.

The ICS Chairman prepared a new draft which was submitted to the ICS Bureau for discussion on April 13 and 14, 1996. There a final text was approved and submitted for vote to the Full Commission. That text is here included as **Appendix C**. The deadline for the ICS Subcommissions to submit their votes was June 30, 1996. Although, this is a complete rewritten version of the Guidelines, where most suggestions and comments made by the ISSC members have been incorporated, I believe it is important to have the opinion of the whole ISSC membership, especially considering some strong objections to the previous version. On that basis I voted against the immediate approval of the Guidelines and I will send the ISSC position when I have the opinion of its members. Therefore, I would thank all ISSC members to send as soon as possible their views and comments and a definite answer on the approval or not of the Guidelines.

Additional comments to the Guidelines version reproduced in ISSC Circular 90 are included below.

Ki-Hong Chang

I have read both drafts prepared by ICS and by ISSC representatives... and my view is that both drafts deserve independent publication after some modifications.

Roger Cooper

Having read through the ICS draft Guidelines there is little that I would disagree with. However, I find it a rather convoluted discussion incorporating background (i.e. reasons for updating the Cowie 1985 version), history, procedure and principles.

Background and history - This material would be better separated out into an introductory section.

Procedures for submission of GSSP proposals - This is the proper domain of the ICS and, in general, is well covered.

Principles and geological requirements for GSSP - This is appropriate in a document on guidelines. The requirements listed are OK, except for terms like biochronozones (what are these?). But it is a great pity that the ICS apparently does not regard the ISSC Guide as adequate authority for principles of GSSP designation. I would like to hear how the ISSC Guide is in contradiction with the ICS guidelines (item 3). A short discussion on principles of chronostratigraphy is not out of place but I would like to see the ISSC Guide quoted, and referred to more where appropriate.

In general, I agree with the comments made by Mike Murphy and think some reorganization of the guidelines could greatly improve the document. It can be better focused and some largely irrelevant discussion (eg. item 12, discussion about opinions of Sandberg, Klapper) omitted. Section 3.3. (items 12-15) needs rewriting. I would not remove as much material as Amos Salvador as done but his revised draught (Appendix D) does provide a good example of how to improve the clarity and focus of the document.

Yu. B. Gladenkov

It is necessary to reflect in the Introduction the existing personal opinions on the Guide concept. The fact that all research methods are oriented to chronostratigraphy should be stressed. All existing views on the Guide structure and stratigraphic classification should be found out.

Nils Spjeldnaes

I am a bit worried about two points, which are briefly touched in the circular. One is the accessibility (points 33-35 on p. 8 of Appendix C). I am in complete agreement with the suggested text, but there are some underlying problems. In Norway we have a number of protected localities (especially in the Lower Paleozoic of the Oslo Region), which partly are preserved for fossil content, and stratigraphic importance. The mechanism is that all collecting is forbidden from solid rock in these localities. Dispensation can be given by the natural conservancy officer in the local county, and a specific permission from the landowner is needed. Since the natural conservancy officers normally would not have a competence in this field, they will have to seek advice about the dispensations among local geologists/stratigraphers. Unless a simple and rapid procedure is established, this may be a complicated and time consuming bureaucratic procedure, which in some cases will cause an effective barrier to realistic access to a type locality. Several unrelated developments can also be calculated to give problems. Because of wanton collection - both in protected and unprotected geological localities on private land - many landowners have become very restrictive in giving access to localities on their land to foreign geologists. "Green" organizations are also active to prevent dispensations from any protection of nature, and even if their ultimate goals are understandable, their protests may cause time consuming procedures before a dispensation can be given. These problems makes it almost impossible to guarantee a permanent access to boundary localities in Norway, and the legal complications will be almost unsurmountable. Other countries have different rules, but in general the tendency is to increase the restrictions, and it will also in general be difficult to assure permanent accessibility to boundary localities. In cases where access has been promised, political changes could easily change the rules (this is - as mentioned - the current trend), and it would be extremely difficult to change a boundary stratotype because the rules regulating access has been changed by a democratic political procedure. Another potential problem is that many countries - as a condition to give work-permit to foreign scientists at all - requires both cooperation with local scientists, and that the collected material should be returned to the country of origin - if permitted to take it out at all. I am really in favour of many of these restrictions, to preserve the scientific cultural heritage of smaller, and often less developed countries. The possible solution to these problems may be to delegate the maintenance, study and protection of boundary stratotypes to the local (national) Committees on Stratigraphy, and let all requests for information, samples and studies be routed through these committees.

My other worry, which is related to my current work on increasing the precision of stratigraphy, is that we have to be prepared for discoveries of index fossils below the marker point ("golden spike"). This will certainly result from intense studies on the stratotypes themselves, and other sections, especially if the marker fossils are rare macrofossils. The use of microfossils should be encouraged, either as the marker fossils themselves, or as ancillary markers. The methods to increase precision are - in my opinion - related to good paleontological practice (precise determination of fossils and their variability), and to considerate use of quantitative methods in sampling, and treatment of the fossils. I am somewhat reluctant to some of the current trends in using mathematical models in biostratigraphy ("quantitative stratigraphy"). The idea is basically a good one, but the first requirement is that the input data are of high quality (that is more important than their number). I also have a feeling (but here I must admit that my competence in computing is not good enough for a final judgement) that some of the current models are not sufficiently robust for the wrong and incomplete data we only too often meet in the daily stratigraphic practice.

Jürgen Remane

I was surprised to see that the Guidelines of ICS are considered by some (e.g. M. Murphy) as being in competition and in conflict with the International Stratigraphic Guide (ISG). In my view, both documents complete each other. It is very clearly stated in the foreword of the ISG "that nobody should

feel constrained to follow it". Indeed, as desirable as it is to arrive at a unified stratigraphic terminology (not to be confused with nomenclature), a certain freedom of usage is necessary to cope with specific situations or simply with different traditions. Here I may recall the disclaimer on p. 2 stating that the ISG is in disagreement with the North American Code of Stratigraphic Nomenclature in some points, which in my opinion does not harm to the ISG.

However, for the establishment of a global geochronologic standard, which is of paramount importance for a uniform chronostratigraphic nomenclature, some binding regulations are necessary. It is the task of the ICS Guidelines to define these, and all Subcommissions are invited to participate in the discussion with equal rights. If one or more SCs were to be given a prominent position in the discussion, this would quite naturally be those which have already defined a GSSP and can thus contribute their practical experience. But strict regulations should be limited to the necessary minimum, and in this sense the theme of the Guidelines is not as vast as that of the ISG.

J. B. Waterhouse

I have to say that I am not impressed with Appendix C on Guidelines for establishment of GCS, although some very good people have played a role in presenting it, and there are many good ideas. It is poorly presented, and so full of arguable assertions that any editorial adjustment would probably be wasted. Unless there is some subtle plot to discredit GSC procedures. The bold assertion discrediting priority, for example, is that sort of observation which may cause considerable trouble, even though the statement is partly hedged with qualifications that would do credit to an O. J. Simpson lawyer. The Murphy version is so much clearer and less disputable.

Moreover, I would think there must be need for some restraint before granting full acceptance to the McLaren boundary stratotype principle. It is still early days, and the fact is that the methodology is still being tested. Reservations about the applicability to more than a few modes of fossil distribution in a few geological settings are yet to be disproved. We know that the method falters for Precambrian, and causes difficulties for the Pleistocene-late Pliocene. It may of course work well for some fossil groups, and in some to many settings, but that may result in decoupling the methodology from regions where correlation is more practically based on unit stratotypes. I would therefore see the approach as to be applied with full vigour, as quickly as possible, but with the express retention of scientific caution, and full acknowledgment of contrary or awkward or unresolved difficulties. This has happened in some boundary commission studies, and should be textually reinforced.

V. SEQUENCE STRATIGRAPHY

ISSC Circular No. 90 of August 25, 1995, announced the organization of a working group or committee to review sequence stratigraphy.

As announced a Working Group on sequence Stratigraphy (WG) has now been organized by Bill Berggren and Amos Salvador. It is composed of 15 members representing some of the best qualified stratigraphers to carry out the review; they represent both academic institutions and the petroleum industry: Marie Pierre Aubry (*), Bill Berggren (*), Bob Carter, Nick Christie-Blick, Anthony Hallam, Jan Hardenbol (*), Ken Miller, Don Owen (*), Henry Posamentier (*), L. Sloss (*), Amos Salvador (*), Pete Vail (*), John Van Couvering (*), John Van Wagoner, and Joel Watkins (*).

Most (*) WG members met in Houston in late April. R. Lane, incoming First Vice President of ISC was also present. In preparation for the meeting two memos were distributed to the members of the WG. The first by Amos Salvador and Bill Berggren (November 1, 1995) described the general objectives of the WG, its composition, and its expected modus operandi. The second, by Amos Salvador (January 30, 1996), stated in more detail the objectives of the WG and included a questionnaire the answers to which were expected to provide the basis for the discussions at the meeting in Houston.

Even though the main objective of the WG is to review the concepts and terminology of sequence stratigraphy and of other schemes of stratigraphic classification based on the recognition of "breaks" in the stratigraphic record - the allostratigraphic units of the North American Commission on Stratigraphic Nomenclature, the unconformity-bounded units (synthem) of the ISSC - the leaders of the WG considered the possibility to review and discuss other alleged "new" approaches to

stratigraphic work: genetic stratigraphy, event stratigraphy, cyclostratigraphy, etc. and their possible relationship to sequence stratigraphy.

Reports of the views, conclusions and proposals of the WG will be submitted to the ISSC members and other interested stratigraphers in future Subcommittee circulars. This will assure a broad sampling of opinions from stratigraphers and stratigraphic organizations from throughout the world. With this in mind, the WG tried to establish a communication and cooperation with the Committee on Genetic Stratigraphy that the International Commission on Stratigraphy had planned to appoint, but was informed that the Committee has not yet been organized.

If a reasonable consensus is eventually reached, the review and recommendations concerning sequence stratigraphy hopefully will be published, and eventually used in the preparation of a new chapter, or a modification of the chapter on unconformity-bounded units, of the next edition of the International Stratigraphic Guide.

VI. SECOND EDITION OF THE INTERNATIONAL STRATIGRAPHIC GUIDE

Information prepared by A. Salvador on the reviews and sales of the Guide, is included in **Appendix D**.

VII. GEOLOGICAL MAP OF THE WORLD

Prof. J. Dercourt, Chairman of the Commission for the Geological Map of the World (CGMW) proposed to the ISC Chairman the creation of a joint WG to develop a unified color scheme for the divisions of the chronostratigraphic standard scale which could also be used in the Geologic Map of the World. As a result the ISC Chairman suggested, and I agreed, with a possible cooperation of ISSC. Input from national and regional surveys and bodies is necessary and in this regards it would be important to receive information and/or suggestions from all ISSC members.

VIII. ISC NEWS

New Secretary. On Sept. 1st. 1995 Klaus Gohrbandt withdrew from the post of Secretary General of ICS and in the second half of October Prof. Olaf Michelsen, University of Aarhus, Denmark, became new Secretary General of ICS.

New ICS Officers. The nominating Committee (J. Cowie, UK; B.F. Glenister, USA; F.F. Steiniger, Austria; B.D. Webby, Australia; and W. Ziegler, Germany) to elect ICS officers for 1996-2000, unanimously nominated the following candidates: **Chairman**: J. Remane (Switzerland); **1st Vice-Chairman**: H. R. Lane (USA); **Secretary**: O. Michelsen (Denmark). The proposal was approved by the full ICS and ratified by the IUGS Executive. The **2nd Vice-Chairman** will be nominated, as usually, by the country organizing the next International Geological Congress. As **Past-Chairman** will continue J.W. Cowie.

New Chairpersons and vice-chairpersons of subcommissions nominated for 1996-2000: Voted for the full ICS: **Precambrian**: L. Robb (South Africa) and R. Key (UK); **Cambrian**: J. Shergold (Australia); **Ordovician**: S. Finney (USA) and Chen Xu (China); **Silurian**: M.E. Johnson (USA) and A. Lenz (Canada); **Devonian**: P. Bultynck (Belgium) and R. Crick (USA); **Carboniferous**: J. Roberts (Australia); **Permian**: B.R. Wardlaw (USA) and E. Ya Leven (Russia); **Triassic**: M. Gaetani (Italy) and M. Orchard (Canada); **Jurassic**: G. Pavia (Italy) and D. Guy-Ohlson (Sweden); **Cretaceous**: P. Rawson (UK) and A. Dhondt (Belgium); **Palaeogene**: H. Peter Luterbacher (Germany) and J. Hardenbol (USA); **Neogene**: D. Rio (Italy) and F. Rogl (Austria); **Quaternary**: T.C. Partridge (South Africa) and Ch. Schluter (Switzerland); **Gondwana**: J.W. Collinson (USA) and J.M. Dickins (Australia); **ISSC**: A. Riccardi (Argentina) and M.B. Cita (Italy); **Geochronology**: G.S. Odin (France) and I. Kaneoka (Japan).

ABRD Meeting. On July, 1995, ICS and two other IUGS commissions were critically reviewed by the IUGS Advisory Board on Research and Development (ABRD), during a meeting held at London, Ontario, under the Presidency of Prof. W.G.E. Caldwell, University of Western Ontario. ICS had to prepare a memorandum justifying its "raison d'être". The seven pages memorandum, prepared with the input provided by most ICS bodies - including ISSC -, documented the scientific goals and activities of the various ICS bodies. The evaluation was concluded with the statement that the importance of ICS and of its scientific achievements are fully recognized by the ABRD, and that the Commission merits full support from IUGS also in the future. Additionally the ICS Chairman was asked to write to Subcommissions for their evaluation of the work and administration of ICS and to prepare a report on this subject to be submitted to the IUGS Executive Committee by the 30th IGC.

ICS Annual Report for 1995. On January, 1995 the ICS Bureau presented its Consolidated Annual report for 1995 to the International Union of Geological Sciences. About the ISSC activities the report stresses the following points: "Point (a) of the overall objectives covers indeed the whole field and all aspects of stratigraphy, whereas point (b) characterize ISSC as a link between ICS and the stratigraphic community outside ICS, as national Stratigraphic Committees and Geological Surveys. It certainly would be an interesting task to further develop this line of activity. Otherwise, some old projects have been reactivated, especially the one of creating a short version of the International Stratigraphic Guide. The origin of this idea was to provide a cheap pocket book version affordable for students (ISSC Circular No. 86). This would contain all essentials statements of the ISG, leaving aside detailed discussions".

New GSSP. Four proposals were accepted by the full ICS (with the affirmative vote of ISSC), but only two (base of the Permian and base of the Bajocian) were ratified by the IUGS Executive due to technical difficulties which made that not all the necessary documents were at hand at the IUGS E.C. meeting. The remaining two will be discussed at Beijing.

- Permian System, in the Aidaralash creek, northern Kazakhstan.
- Bajocian Stage, in Cabo Mondego, Portugal.
- Emsian Stage (Devonian), in the Zinzilban Gorge, Uzbekistan.
- Neogene System, in the Lemme-Carrosio section, Italy.

Two other proposals were voted affirmatively by the ISSC Chairman and submitted to the ICS Secretary before June 25th, 1996:

- Gelasian Stage (new stage as the third uppermost part of the Pliocene Series), in the Monte San Nicola, Sicily, Italy.
- Mid-Carboniferous boundary (base of the Upper Carboniferous), Arrow Canyon section, Nevada, USA.

Changes of ICS statutes. At a request from the IUGS Executive Committee (EC) the ICS Bureau at the annual meeting held at Neuchatel on April 13 and 14, 1996, decided to propose the following changes: a) that non-responses are not longer counted as yes-votes; b) that the Chairman of ICS should start as chairman elect (4 years), before being chairman (for 4 more years) and should not be reelected. These changes will be voted after the International Geological Congress.

Global Stratigraphic Chart. The global chart compiled for the 28th IGC at Washington (see Episodes 12/2) is being revised and updated. Input from the ISC subcommissions has been requested.

ICS business meeting at the 30th IGC, Beijing

The following topics will be discussed: 1) Activity report (GSSPs ratified in 1996; The revised Guidelines; Participation of ISC in Symposium 1, Stratigraphy of the 30th IGC); 2) Revision of ISC Statutes; 3) Future organization of ICS; 4) Revision of the Global Stratigraphic Standard of 1989; 5) Importance of GSSPs for the stability of boundary definitions.

The problem of the Neogene/Quaternary boundary. This boundary was formally defined in 1985 by a GSSP (boundary stratotype) at Vrica, Italy. The boundary was placed at a level close to the top of the

Olduvai magnetostratigraphic subchron at approximately 1,7 my. This definition was ratified by IUGS and published in Episodes (8/2). However, there are Quaternary stratigraphers who do not use the Vrica boundary, but place the base of the Pleistocene at 2,5 my, at the magnetostratigraphic Gauss-Matuyama boundary. As a result of this controversy the IUGS Executive Committee recommended that an ad-hoc committee be set up to resolve the problem. This committee should have three people for ICS and three for INQUA and the IUGS Bureau will choose a neutral chairman. As expressed by the ICS Bureau this suggestion is in contradiction with generally accepted procedures of boundary definition and ignores the existence of a Plio-Pleistocene Boundary Working Group, including members from both the Neogene and Quaternary Subcommissions of ICS.

It is quite clear that the process leading to the definition of a GSSP usually implies a lot of work, time and money. The GSSP is defined on the basis of objective stratigraphic information provided by different avenues of scientific research. During this process different candidates for GSSP are confronted in order to select the best among them, the others being discarded. All this process should follow rules and guidelines that are supposed to apply - without exceptions - to the definition of all GSSP. The same guidelines indicate that after a GSSP is approved it should be maintained, unless there are enough scientific reasons to change it. In such a case, there are also rules to comply.

The whole situation should be considered by the ICS (and IUGS). It should be especially considered if the guidelines for GSSP apply also to the Quaternary and if the Subcommission on Quaternary Stratigraphy - that belongs both to INQUA and ICS - has a different status when compared with all other ICS subcommissions.

IX. PUBLICATIONS ON STRATIGRAPHIC CLASSIFICATION, ETC.

Following is a short list of publications on stratigraphic classification, terminology and procedure kindly sent to me by some ISSC members. I would appreciate hearing from other ISSC members concerning publications on these subjects, so additional lists can be included in future circulars.

Devlin, B., 1995. Opening Pandora's Box: The Issue of Sequence Stratigraphic Terminology. Houston Geological Society Bulletin, Nov. 1995: 17-18.

Devlin, B., 1996. The Sequence Strat Terminology Issue: Status and Opinions, Houston Geological Society Bulletin, April 1996: 15-16.

Gladenkov, Yu.B., 1995. Prospects for the Infrazonal (Microstratigraphic) Subdivision of Sedimentary Strata. Stratigraphy and Geological Correlation 3 (4): 337-347.

Johnson, M., 1995. Chronostratigraphy is in fact chronostratigraphy. Geobulletin, Geol. Soc. S. Afr. 38 (3): 7-8.

Winter, H. de la R., 1995. What is chronostratigraphy in fact? Geobulletin, Geol. Soc. S. Afr. 38 (3): 4-7.

X. MEMBERSHIP MATTERS

A. Death of Professor David Graham Jenkins. It is with regret I have to inform that Dr. Graham Jenkins, an ex-officio member of ISSC died on 6 August 1995. Dr. Jenkins was born in 1933 and after his graduation at Aberystwyth, Wales, he worked in Australia, New Zealand and United Kingdom, where he made important contributions in fossil planktonic foraminifera and global Cenozoic biostratigraphy and paleogeography, especially on the Southern Hemisphere. He was member of the Subcommission on Neogene Stratigraphy (1980-1995), Secretary (1984-89) and Chairman (1989-1995) of the Subcommission on Paleogene Stratigraphy, Chairman of the Eocene/Oligocene Boundary Stratotype Working Group (1987-1988) and Member of the Stratigraphy Committee of the Geological Society of London (1988-1995).

APPENDIX A (TO CIRCULAR NO. 91)
DRAFT OF A POSTER ON GUIDELINES FOR NEW
LITHOSTRATIGRAPHIC UNITS (BY J.B. WATERHOUSE)

How to name and describe rock units properly

If you are describing new rocks, there are internationally accepted procedures to ensure your work is accepted for publication and recognized by the scientific community. Here are some of the guide-lines:

Name

- A. Must be based on a name, published on a map, accepted by the national organization of place names, near or at the rocks concerned.
- B. Must be new, and not the same as another published name, even if applied on a different way, within the country, or geological region such as orogen or basin.
- C. The name is accompanied either by the unit - bed, member, formation, group, or dominant lithological rock type.
- D. Validification: The name is established by publication, with adequate description, in a recognized scientific medium (not in unpublished reports or abstracts, and preferably not in field-guides). It dates from the date of publication.

Description

- E. A place for the stratotype, or type section, or type locality should be cited.
- F. Indicate distinctive features of lithologies, diagnosis of overall lithological attributes.
- G. Preferably widely mapped, and with indication or regional aspects (not based on single examined section, if possible).
- H. Data on fossil content, geochemistry, geomorphic expression, thickness and variation.
- I. Geological age, correlation with other units, genesis and significance for paleogeography and geologic history.

These and other specifications are defined and explained in the International Stratigraphic Guide, A Guide to Stratigraphic Classification, Terminology and Procedures, 2nd edition. Amos Salvador, editor.

Published by the International Union of Geological Sciences and Geological Society of America, 1994, available from Publication Sales, Geological Society of America, PO Box 9140, Boulder Co 80301 USA Fax 303-447-1133.

Price (state if can use credit card.

Or give alternative sources for purchase - maybe copies should sent to Geol. Socs. or govt in various countries)

**APPENDIX B (TO CIRCULAR NO. 91)
ANSWERS TO QUESTIONNAIRE ON GSSP GUIDELINES**

1. The GSSP Guidelines should be approved as prepared by the ICS Bureau (see Appendix C to ISSC Circular No. 90).

Agree: Gladenkov

Disagree: Cooper, Holland, Murphy, Salvador, Takayanagi, Waterhouse, Winter.

Comments:

Gladenkov: It is necessary to reflect in the Introduction the existing personal opinions on the Guide concept.

Salvador: They are incredible long, confusing, verbose, and cover all kind of unnecessary subjects.

Waterhouse: In its present form, with respect, it is unworthy:loosely written, loosely presented. The last sentence of 1.2 is disgraceful.

Winter: Too woolly and contradictory in places.

2. The draft prepared by the ICS Bureau should be approved in general, but some modifications should be introduced.

Agree: Cooper, Gladenkov, Holland, Takayanagi

Disagree: Murphy, Salvador, Waterhouse, Winter.

Comments:

Cooper: The modifications should involve some reorganization.

Gladenkov: The fact that all known research methods are oriented to chronostratigraphy should be stressed.

Salvador: I think we should start from scratch, with a shorter, simpler, and more direct version of the "Guidelines".

Waterhouse: Unless the skills of a Hedberg or Salvador are brought to bear, it will raise more difficulties than it solves.

Winter: Too many modifications required.

3. The modified version of the original Guidelines (see Appendix B of ISSC Circular # 88) should be submitted for approval to the ICS.

Agree: Gladenkov, Murphy, Salvador, Takayanagi, Waterhouse, Winter

Disagree: Holland, Salvador

Comments:

Cooper: Abstain. I don't have a copy of the ISSC version with me.

Gladenkov: All existing views on the Guide structure and stratigraphic classification should be found out.

Waterhouse: I favour a short version.

Winter: Have not seen No. 88.

4. A new version of the Guidelines should be prepared.

Agree: Cooper, Gladenkov, Murphy, Salvador, Winter

Disagree: Holland, Waterhouse

Comments:

Salvador: We should not be pushed to approve a very poor document just because it is said that it should be finished by a certain date.

Winter: Take heed of comments by M. Murphy, A. Salvador. A GSSP should be the best available basal boundary point of a Standard Global Chronostratigraphic Unit as defined in ISG (2) p. 85, but selected at a site of continuous deposition. If the traditional unit

stratotype cannot be followed into continuous deposition (eponymous region) then all attempts to define this point in other regions globally will be approximate or will have to be redefined in a region where an unconformable situation becomes conformable.

5. The draft prepared by the ICS Bureau (see Appendix C of this circular) should be approved but item [3] should be left out.

Agree: Takayanagi

Disagree: Cooper, Holland, Murphy, Salvador, Waterhouse, Winter

Comments:

Waterhouse: Except leave 3 out by all means.

Winter: Not good enough

6. The draft prepared by the ICS Bureau (see Appendix C of this circular) should be approved, but for item [3] contradictions with the ICS Guide should be clarified.

Agree: Gladenkov, Takayanagi

Disagree: Cooper, Holland, Murphy, Salvador, Winter.

Comments:

Waterhouse: leave it out.

Winter: Same reasons as 5 and all others.

7. The draft prepared by the ICS Bureau (see Appendix C of this circular) should be approved, but on item [13] the ISSC should uphold the position adopted in the I.S. Guide.

Agree: Gladenkov, Takayanagi, Waterhouse

Disagree: Cooper, Holland, Murphy, Salvador, Winter.

Comments:

Winter: 13 not the only problem.

8. The draft prepared by the ICS Bureau (see Appendix C of this Circular) should be approved in general, but the following items should be rewritten (R) or omitted (O).

To be rewritten:

Takayanagi: 1, 2, 7, 11, 12, 24, 31

Winter: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 14, 16, 17, 19, 24, 25, 27, 31, 42.

To be omitted:

Takayanagi: 3, 13

Winter: 10, 23,

Waterhouse: most of it omitted or rewritten.

With regard to Item 15 A. Salvador noted that “stages are not geochronologic units! They are chronostratigraphic units”.

**APPENDIX C (TO CIRCULAR NO. 91)
GUIDELINES FOR THE ESTABLISHMENT
OF GLOBAL CHRONOSTRATIGRAPHIC STANDARDS BY ICS (REVISED)
(BY J. REMANE ET AL.)**

APPENDIX D (TO CIRCULAR NO. 91)
SALES AND REVIEWS OF THE SECOND EDITION OF
THE INTERNATIONAL STRATIGRAPHIC GUIDE (BY A. SALVADOR)

As of mid-February, 800 copies of the second edition of the International Stratigraphic Guide had been sold by the Geological Society of America.

Twenty two reviews of the Guide have been published so far, and five others are to be published in the near future. Following is a list of the journals where the reviews were published and of the authors of the reviews, organized by country.

Argentina

Revista de la Asociación Geológica Argentina, v. 49, nos. 3-4, p. 378, 1994, by A.C. Riccardi

Australia

The Australian Geologist, no. 93, p. 61-62, 1994, by Tony Cockbain.

ESRISAT, Australian Mineral Foundation, Informative Book Review Series No. 2566, 1994, by B.G. Forbes

Bulgaria

Geologica Balcanica, v. 24, no. 6, p. 103-105, 1994.

Review of the Bulgarian Geological Society, v. 56, pt. 1, p. 113-116, 1995

Priroda (Popular Scientific Journal of the Bulgarian Academy of Sciences), no. 3, 1994

All three by I. Sapunov

Czech Republic

Journal of the Czech Geol. Soc., v. 39, no. 4, p. 296, 1994, by Ivo Chlupac

France

Geochronique, no. 54, p. 25, 1995, by P. De Weber

Germany

Newletter on Stratigraphy, v. 32, no. 3, p. 175, 1995, by Gerd W. Luttig

Italy

Bolletino della Societa Geologica Italiana, v. 114, Fasc. 3, p. 679, 1995, by M.B. Cita.

Rivista Italiana di Paleontologia e Stratigrafia, v. 100, no. 4, 1995, by M. Gaetani

Lithuania

Journal of the Geological Soc. of Lithuania, no. 4, p. 87-88, 1995, by A. Grigelis

New Zealand

New Zeland Journal of Geology and Geophysics, v. 38, p. 403-405, 1995, by Roger Cooper

South Africa

Geobulletin, v. 38, no. 1, p. 10-11, 1995, by Mike Johnson

Spain

Noticias Paleontológicas, no. 24, 1994, by Salvador Reguant

The Netherlands

Earth Science Reviews, v. 39, nos. 1-2, p. 123-127, 1995, by G.S. Odin

U.S.A.

Bulletin of the American Association of Petroleum Geologists, v. 79, no. 8, p. 1189, 1995, by Charlotte Schreiber

Economic Geology, v. 90, no. 8, p. 2376, 1995, by Frank Kottlowski

Geotimes, v. 39, no. 10, p. 40, 1994, by Don Baars

Journal of Sedimentary Research, v. B65, no. 3, p. 417, 1995, by Donald E. Owen

Micropaleontology, v. 42, no. 1, p. 64, 1996, by John Van Couvering

PRISCUM (Newsletter of the Paleontological Society), v. 6, no. 1, p. 16-17, 1996, by William C. Elsik

Alexander Zhamoida advises that “information about the second edition of the Guide has been published in the journal Regional Geology and Metallogeny (St. Petersburg), and in the Transactions of the Siberian Institute (Novosibirsk)”, but he did not include copies of the publications.

As additional reviews are published, they will be reported in future ISSC circulars. Meanwhile, if reviews of the Guide, other than those listed above, come to the attention to readers of this circular, a note and, if possible, a copy of the review will be much appreciated.

The reviews range from purely descriptive - number of chapters, content of the chapters and of other sections of the Guide, etc. - to more thoughtful and highly complimentary. Many of the reviews recommended that stratigraphers interested in complying with the principles of stratigraphic classification and nomenclature accepted over much of the world now should consult the Guide, which several reviewers believe should be in every stratigrapher's bookshelf. The second edition of the Guide is acknowledged as making an important contribution to the improvement of international communication and understanding in stratigraphic work.

An exception to the generally favorable reviews is that of G.S. Odin in Earth Sciences Reviews. This review is highly critical of many aspects of the Guide and of its editor, to whom he consistently refers as the “author”. Dr. Odin states, for instance, that the Guide “is the result of a personal synthesis, following many discussions, and represents merely one view amongst others. The author of the volume militates for an ‘international agreement’, i.e. his proposals”. He states that the Guide “clearly represents [the author's] own personal views ... influenced by his own professional experience, scientific background and cultural

environment”, and he adds that “not everyone is cast in the particular American model described”. He objects to many of the Guide’s discussions and recommendations. He disapproves of the recommended procedure for the selection of boundary stratotypes for chronostratigraphic units and asserts that “Following an old fashioned Anglo-Saxon concept, chronostratigraphic units are said to be defined with the emphasis on the lower boundary ... Not everyone will agree with this...”.

Dr. Odin finds little in the Guide that he likes. He “regrets, denies, and rejects the choice of the term ‘geochronometry’ to designate a field of scientific study”, and regrets “the debatable distinction made between formal units (capitalized: litho-, bio-, chrono-, magnetostratigraphic and unconformity-bounded units) and informal ones (non-capitalized: chemostratigraphic or physical, or with a genetic meaning).” He even objects to the list of National or Regional Stratigraphic Codes which he believes “partly reflects [the author’s] personal judgment on publications, some of which have the same ‘international’ pretensions as the present Guide”, and to the Bibliography which he says “includes the 2 or 3 previous editions of the same volume by the same author...” (?), and “is mostly a list of historical publications dealing with theoretical principles”. Dr. Odin summarizes his review by stating that the Guide “is a book on theory; an important reference for a particular school of thought leading to a rigid scheme; a locally old fashioned descriptive view of stratigraphy underestimating some recent knowledge”.

One criticism of the Guide voiced by Dr. Odin that is also expressed by a number of reviewers is that it did not include a discussion of sequence stratigraphy. There was a good reason for not doing so.

The ISSC was aware in the last 1980s, of course, that a “new” approach to stratigraphy -sequence stratigraphy- was becoming extremely popular. There was no time, however, to investigate and discuss this subject if the second edition of the Guide was to be published not much later than 1993 or 1994 (the final manuscript was mailed to the IUGS in March 1993). As all ISSC members are well aware, the Subcommittee because of its large membership and way of operation, works very slowly: To reach an agreement and to be ready to publish a note on magnetostratigraphic units took 6 years; another 6 years were spent discussing unconformity-bounded units, and 9 years in dealing with igneous and metamorphic rock bodies. If we had tackled sequence stratigraphy in the late 1980s, the publication of the second edition of the Guide would have been delayed by several years, something we did not favor.

An explanation of why a discussion of sequence stratigraphy had not been included in the second edition of the Guide perhaps should have been included in the Preface, but ... hindsight is always better than foresight.

As reported elsewhere in this circular, a Working Group to review sequence stratigraphy and related subjects has now been organized and has initiated its activities. Its conclusions and recommendations will be submitted to the ISSC members for discussion and, hopefully, will be made known to stratigraphers everywhere in a publication of widespread distribution.