

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

**OF**

**IUGS INTERNATIONAL COMMISSION ON  
STRATIGRAPHY**

**CIRCULAR NO. 92**

**MARCH 25, 1997**

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## **I. REPORT OF MEETING OF ISSC AT 30th INTERNATIONAL GEOLOGICAL CONGRESS (BEIJING, AUGUST 1997)**

The International Subcommittee on Stratigraphic Classification (ISSC) held a business meeting in Beijing (China), on August 8, 1996, during the 30th International Geological Congress. Place and time of the meeting resulted in a very limited attendance: only 6 members were present. The meeting was attended by Prof. Jurgen Remane and Dr. Richard Lane, Chairman and ViceChairman of the International Commission on Stratigraphy.

The following items were on the Agenda:

### **A. Report of Chairman for period 1992-1996.**

Status of the Subcommittee. During the last International Geological Congress (Kyoto, August 28, 1992) M. Murphy assumed as Chairman and A. C. Riccardi as ViceChairman of the Subcommittee.

M. Murphy undertook several projects, i.e.: a) publication of a short version of the International Stratigraphic Guide; b) preparation of a modified version of the GSSP Guidelines; c) preparation of a supplement to the Guide on Sequence Stratigraphy. These subjects began to be discussed through ISSC Circulars 86 and 87.

However, during 1994 the status of the Subcommittee was the subject of some controversy, as the ICS Bureau reviewed the activities of the Subcommittee and decided to conduct formal discussions with the ISSC Chairman and the IUGS Secretary General before proposing to convert the Subcommittee to a Committee. Matters at stake were: a) main objectives of the Subcommittee; b) possible interferences with the ICS Bureau and the recently created WG on Genetic Stratigraphy on matters such as Guidelines on GSSP and classification of sequence stratigraphy.

On June 1994 M. Murphy offered his resignation as Chairman, which was accepted by the ICS Bureau and A.C. Riccardi became new ISSC Chairman. A meeting between Prof. J. Remane and the ISSC Chairman in October 1994, resulted in a working agreement on the goals and activities of ISSC. It was agreed that the Subcommittee would continue as such, whilst the Committee on Genetic Stratigraphy would remain independent. As before the main goals of ISSC would be to conduct and animate international discussions on stratigraphic classification, terminology and procedure, especially in the fields of seismostratigraphy, event stratigraphy and chemostratigraphy. It would also discuss sequence stratigraphy, but once the Committee on Genetic Stratigraphy had produced its first report, a clear limit should be worked out on the subjects to be handled by the Subcommittee and the Committee. Additionally ISSC would continue to channel information from and to the ICS originated in the international geologic community. Finally, the project on the short version of the International Stratigraphic Guide would be continued and its publication concerted with the Geological Society of America.

Membership of the Subcommittee. Changes in the last four years originated in the death of 2 individual members and incorporation of one new individual member. Membership stands now (1996) at: 30 individual, 18 ex-officio and 23 organizational members. Total number: 71 members.

Circulars. Since the meeting of the Subcommittee during the 29th International Congress in Kyoto, the Subcommittee distributed 6 circulars, 2 from the end of 1992 to beginning of 1994, 3 in 1995 and one in 1996.

Publications. As of mid-February 1996, 800 copies of the International Stratigraphic Guide had been sold by the Geological Society of America. Twenty two reviews of the Guide were published, mainly by Subcommittee members, in 13 countries and five others were known to be published in the near future.

Finances. Money allocated by IUGS to the Subcommittee amounted to U\$ 585 in 1995 and U\$ 780 in 1996. Additional money was sought by the Chairman within its own country in order to cover printing of Circulars and mailing costs.

Others. Scientific activities of the Subcommittee will be discussed under other items of the Agenda.

## **B. Election of officers of ISSC for term 1996-2000.**

In the election held in 1995 Alberto C. Riccardi and Maria Bianca Cita were elected Chairman and Vice Chairman of the Subcommittee for the term 1996-2000. Results were ratified by the ICS and the IUGS Executive Committee.

## **C. Plans for the period 1996-2000.**

Membership of Subcommittee. A.C. Riccardi remarked that even if number of members (71) appears quite large it is below historical levels. He also stressed the fact that for the ISSC work it is important, besides expertise, a broad and active international representation. At present individual and organizational members represent 29 countries (17 europeans, 5 american, 6 australasians and 1 african). Degree of participation of individual and organizational members will be analyzed in order to discharge those that are not active. Additionally new members will be incorporated, especially from underrepresented scientific and geographic areas. Suggestions and advise of the Subcommittee membership on names of candidates are welcome.

Publication of the Abridged version of the Guide. A draft of the complete short version of the Guide was prepared by M. Murphy and discussed through several Subcommittee Circulars. A final version will be included in the next circular for approval of the Subcommittee [**Appendix A** to the present Circular].

Means of promoting compliance of rules on stratigraphic classification. A.C. Riccardi informed that members of the Subcommittee have indicated their concern on the ignoring of basic principles of nomenclature by many geologists. This could be due to the fact that distribution of information on basic stratigraphic principles is limited. It should be realized that activities of the Subcommittee should not only be limited to conduct discussion and propose guidelines on stratigraphic classification, etc., but also should be concerned in promoting them. This is clearly shown by J.B. Waterhouse proposal to prepare a poster on lithostratigraphic units (see ISSC Circular No. 91). This and other possible ideas on the matter should be explored further.

Organization and activities of the WG on Sequence Stratigraphy. As a result of an inquiry conducted through Circular 87, where a majority of ISSC membership was in favor of preparing a supplement to the Guide on Sequence Stratigraphy, a working group was organized. Main focus of its discussions was on the difference between units recognized exclusively on being bounded above and below by discontinuities and the sequences of seismic and sequence stratigraphy and the significance of correlative conformities. Discussions on this matter will continue with an active participation of the ISSC membership.

Plans for working on other possible units of stratigraphic classification (e.g. event stratigraphy, cyclostratigraphy, chemostratigraphy). A.C. Riccardi stressed the need to work on other possible units of stratigraphic classification, e.g. event stratigraphy, chemostratigraphy, cyclostratigraphy, etc. M. Bianca Cita mentioned people that could be useful in a working group on cyclostratigraphy.

Translation of stratigraphic terms into various languages. An old project of the Subcommittee was to produce a glossary of stratigraphic term in several languages. One in English was included in the last edition of the Guide. Now it is time to discuss the convenience to translate it in other languages.

Other. A.C. Riccardi made a summary on the participation of ISSC in the discussion of the modified version of GSSP Guidelines.

## **II. SHORT VERSION OF THE GUIDE**

In ISSC Circular No. 91 I mentioned that a final draft of the abridged version of the International Stratigraphic Guide would be included in this Circular. This draft, here included as **Appendix A**, is the result of extensive discussions between Mike Murphy -who prepared the original draft- and Amos Salvador, plus comments and suggestions by several other ISSC members (see ISSC Circulars No. 88, 90 and 91).

There are two items in which there is still some disagreement. One refers to the section placed inside a margin on page 6 of Appendix A, which was added by Mike Murphy even if it is not a part of the second edition of the Guide. The second concerns the extent of section 4.B.7 (Holo-, para-, neo-...) on page 12 of Appendix A, which could include the entire text or have just the heading without any further text as done for other sections of the abridged Guide.

I will very much appreciate receiving any additional comments you may have about it. If I receive no additional comments, I will consider the present version ready for final editing and we could start to see how to publish it.

### III. SEQUENCE STRATIGRAPHY

In ISSC Circular No. 91 of July 5, 1996, I announced the organization of a working group on sequence stratigraphy (WG). I also mentioned that the WG met in Houston in April 1996 and I made some general comments about its activities.

A report on those activities and a questionnaire have now been prepared by Amos Salvador and are included as **Appendix B** to the present Circular.

Answers and comments from the ISSC membership are welcome.

### IV. GUIDELINES FOR GSSP

Appendix D to ISSC Circular No. 91 of July 5, 1996 included the final text of the new Guidelines for GSSP approved by the ISC Bureau and submitted for vote to the Full Commission (deadline June 30, 1996). As informed at that time it was a fully rewritten version where most suggestions and comments made by ISSC members were incorporated. Nevertheless I voted against the immediate approval of the Guidelines, as I considered important to have the opinion of the whole ISSC membership, especially considering some strong objections to a previous version.

The ICS vote for approval of the Guidelines was as follows: 18 yes, 1 no, 2 no votes. Thus the final vote was 20 yes and 1 no and the revised Guidelines are now an official document of ICS.

Even if the Guidelines are approved following are some comments on the Guidelines (Appendix C to ISSC Circular No. 91) made by Bruce Waterhouse on August 3, 1996 .

#### **Bruce Waterhouse**

This seems to me to be greatly improved. I raise some questions, not all of the minor to me, but overall the project now looks very worthwhile. Setting aside these points, I find many excellent points made, and believe it will be very useful.

**2.2.** Why not a more useful overall name, such as Precambrian Standard Strat. age" -or is that too obvious? And think of having an "Absolute age Standard Strat. age, to extend from Precambrian to present?

**2.4.** Many paleontologists & stratigraphers would deplore this "gradualist" philosophy, and it is surely widely appreciated, if not by the GCS committee, that evolution can be very rapid - if not catastrophic. Personally I don't see what this intrusion of personal philosophy is needed: it is contentious, and stands under threat of being outdated. Indeed, some of the early workers, being Huttonists, were gradualists. That still allows valid criticism of choices vitiated by gaps and condensation. There has to be unease at dismissal of natural sequences explained away as "unnatural".

Para 3. Of course, a new name might be validly preferred over endless changes in definition.

Para 4. decided by a majority vote. But as 6 widely allows, or changed by a majority vote.

**2.5.** I realize this lies at the very heart of the GSC, and I am well aware that my little arguments will not divert from what frankly seems to be a holy obsession. No wonder they also admit to seeking "the Holy Grail". Precisely, and I would rather science did not pursue such a medieval goal, or

anything like it, with such exclusive dedication. Yet as a goal for the world-wide scale, it must have merits. It is when the procedure is applied locally to faunal sequences that difficulties arise, but I suppose that is hardly the fault of the GSC.

3. Good. But I do believe that “the gradual transition between marker & ancestor” may be a phantom. How do the writers know evolution was so Darwinian in pace? And why take the risk of later being proved wrong?

4. para intro. I suppose we have to believe that democracy works for science. You would hardly think so given the actions of some governments, but then, we also are to have faith in the holy grail. One of the principal concerns of international committees ought to be how to retain the rights of individuals to break loose from the confines of international regulations we are in the process of drawing up, not so much for the individual’s sake, but for the sake of true science. Especially in view of the tyranny imposed in many scientific journals by editors and referees, who permit only the party line. Yet instead, committees are being taken over by precisely the kind of dictator who, in the name of conformity, is the enemy of science.

4.1.2. This is the sort of thing that gives geologists a bad name, for being so imprecise. Sedimentation at the rate of 1 mm a year is hardly continuous, yet would yield a pile of sediment much thicker than most global stratotypes. So what is meant by continuous? And at what rate?

4.1.4. Continuing or nearby tectonic disturbance might be helping provide the sediment.

## **V. DRAFT OF A POSTER ON GUIDELINES FOR NEW LITHOSTRATIGRAPHIC UNITS**

Appendix B to ISSC Circular No. 91 of July 5, 1996, included a proposal prepared by Bruce Waterhouse for a poster on lithostratigraphic principles. Comments and suggestions on this proposal were requested to the ISSC membership. Thus far I have not received any response. I would like to reiterate my request for comments and suggestions.

## **VI. GEOLOGIC MAP OF THE WORLD AND GLOBAL STRATIGRAPHIC CHART**

In ISSC Circular No. 91 of July 5, 1996 I announced that the ICS Chairman, Prof. J. Remane, had requested the cooperation of ISSC in a joint WG of the Commission for the Geological Map of the World (CGMW) and ISC, 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.

Since then collaboration between ICS and CGMW was the subject of a meeting during the last International Geological Congress (Beijing, August 1996) and has focused in two subjects: 1) The establishment of a Global Chronostratigraphic Chart; 2) The establishment of a list of letter-symbols for chronostratigraphic units.

On January 30, 1997, another meeting took place at Paris, where the ICS was represented by its Chairman, Jurgen Remane and the ISSC Vice-Chairwoman, Maria Bianca Cita. On this meeting, the objectives of the WG were reconfirmed (ICS Circular 1997-1):

“In cooperation with CGMW and Unesco, ICS will establish a Global Stratigraphic Chart, indicating those divisions which can be recommended for international use, down to stage level, where possible. A typographic distinction will be made between different ‘levels of confidence’:

1) Boundaries which are formally defined by a GSSP or a GSSA; in most cases this implies that the name of the overlying stage is formalized;

2) ‘Semiformal’ names of stages (series); these are not yet defined by a GSSP or a GSSA, but have been adopted in a postal ballot by the respective Subcommission (as in the case of the Permian, the Triassic, and the Archean);

3) Informal, but generally agreed global chronostratigraphic units.

In the same time, a unified scheme of letter symbols for chronostratigraphic divisions down to series will be developed, to be used in the Geological Map of the World.

A draft [prepared by ICS Chairman, Jurgen Remane] shall serve as a basis for the establishment of the Global Chart as described above. The final version of the Global Chart will be used by CGMW to decide on the colours to be used for the divisions down to series level.

The Global Chart will be accompanied by a brief explanatory note (a couple of pages for the whole stratigraphic column) giving additional information about the state of the art concerning the system of global chronostratigraphic units. This will also include a list of all GSSPs which have so far been adopted. The chart will be periodically updated by ICS."

**Appendix C** to the present circular includes the draft of the Global Chart and a questionnaire concerning it, prepared by Prof. J. Remane, ICS Chairman.

ISSC Individual and Organizational Members are requested to send their comments and suggestions by June 1, 1997, in order to compile them for submission to ICS Chairman by June 15, 1997.

## **VII. SECOND EDITION OF THE INTERNATIONAL STRATIGRAPHIC GUIDE: SALES, REVIEWS, TRANSLATIONS AND ACCEPTANCE IN EAST ASIA.**

Information on the reviews and sales of the Guide, was included as Appendix F to ISSC Circular No. 91. More news on the same subject have been sent by Amos Salvador and are given below.

As of mid-November, 1996, 1,100 copies of the second edition of the International Stratigraphic Guide had been sold by the Geological Society of America (GSA). The price of the Guide was reduced from \$48 to \$36 (\$28.80 for GSA members) until March 1997. The Guide can now be obtained worldwide with secure credit-card ordering through the Webb. The URL of the GSA Bookstore is "http://www.geosociety.org".

Since last reported in ISSC Circular No. 91 of July 5, 1996, two additional favorable reviews of the second edition of the Guide have been published: one by Géza Császár in the Acta Geologica Hungarica (v. 38, no. 3, p. 283, 1995), and a second one by Milan Misik in Mineralia Slovaca (v. 28, no. 5, p. 6, 1996).

A Chinese translation of the Guide was published in late 1995 and early 1996. By mid-November, 700 copies had been sold (at a price of \$1.50) or distributed among Chinese stratigraphers. The translation was done by a group of qualified stratigraphers from the Nanjing Institute of Geology and Paleontology of the Academia Sinica, and from the Nanjing University. The ISSC is most appreciative of the efforts of this group in undertaking the difficult task of translating the Guide into the Chinese language. The Chinese translation of the Guide is attractively published in hardback and paperback and covers 145 pages.

Dr. J. Thomas Duto of the U.S. Geological Survey in Washington, D.C., informs that the second edition of the International Stratigraphic Guide has been accepted by a group of East-Asian countries that have organized under the auspices of the IUGS Coordinating Committee for Coastal and Offshore Programmes in East and Southeast Asia (CCOP) and the U.S. Geological Survey a Working Group on Geological Correlation (WGGC) to ultimately produce a stratigraphic data base for eastern Asia; this will consist of: 1) a lithostratigraphic lexicon, 2) a biostratigraphic lexicon, and 3) a listing of isotopic dates. This information is being prepared for each country and will be compiled for the entire region in a CD-ROM format. The countries participating in this program are: Cambodia, China, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Philippines, Thailand, and Vietnam. Forty copies of the Guide have been distributed to stratigraphers of these ten countries.

Two general meetings have been held with representatives of these countries. The first meeting of the WGGC was held in Chiang Mai, Thailand, from March 4th through 8th, 1996. The philosophy and guidelines for assembling this data base were discussed in some detail and general procedural matters were agreed upon. The two more significant decisions were: 1) English will be used for all the data bases; 2) the second edition of the International Stratigraphic Guide will be the final arbiter in questions of stratigraphic usage.

A second meeting was held in Shanghai on November 1, as a part of the annual CCOP meetings. All ten member nations presented progress reports on the compilations, which by general agreement were begun for the Tertiary part of the sequence. Expectedly, the rate of data accumulation varied from

country to country, but good progress has been made by all nations and a few have made great strides. The most progress has been in collecting and organizing isotopic ages for the geochronological part of the project.

## VIII. ISC NEWS

ABRD Meeting. As mentioned in ISSC Circular # 91, on January, 1996, the IUGS EC considered the Report on ICS activities produced by the Advisory Board on Research and Development (ABRD). According to that Report, which became available during the 30th IGC at Beijing, ABRD “fully appreciates the importance of ICS’ role in many aspects of the geological work being advanced by IUGS. Unfortunately, ICS is commonly perceived as a commission that send groups around the world to analyze sections and recommend, after very prolonged analysis (8, 10, 15 or even 18 years), the location at which a boundary-defining spike should be driven”. On that basis the IUGS Board “would encourage ICS, and particularly its Bureau, to expand its scope. ABRD envisions a greater focus on other applications of stratigraphy and the benefits derived from them” ... “The Board also recommends that the Chairman of ICS take measures to build cohesion within the Commission. There appears to be a good deal of internal dissatisfaction regarding the manner in which the Commission has been managed over a number of years. To this end, the Board recommends that the Chairman conduct an open, internal evaluation and compile the findings into a short report to be appended to the Annual Report of ICS. Each Subcommission and Working Group should be invited to suggest steps for achieving involvement in all aspects of modern stratigraphy; comment upon the strengths/weaknesses in ICS and its current structure; and recommend any changes it deems desirable”.

The evaluation produced by me, as ISSC Chairman, is included as **Appendix D** to the present circular.

ICS business meeting at the 30th IGC, Beijing. On August 9, 1996, the ICS met in Beijing, China, for a Business meeting. The meeting was chaired by Prof. J. Remane. All topics mentioned in ISSC Circular # 91 were considered. Additionally, Subcommission Chairmen present at the meeting, gave brief Reports.

New GSSP. Since ISSC Circular # 91 four new GSSP were were ratified by the IUGS Executive:

- Base of the Emsian Stage (Devonian), in the Zinzilban Gorge, Uzbekistan.
- Mid-Carboniferous boundary (base of the Upper Carboniferous), Arrow Canyon section, Nevada, USA.
- Base of the Neogene System, in the Lemme-Carrosio section, Italy.
- Base of the Gelasian Stage (new stage as the third uppermost part of the Pliocene Series), in the Monte San Nicola, Sicily, Italy.

Another proposal voted by the ICS was:

- Base of the Darriwilian Stage of the Ordovician System, in Huangnitang, Zhejiang Province, China

Changes of ICS statutes. As informed in ISSC Circular # 91 at a request from the IUGS Executive Committee (EC) the following main changes were proposed by the ICS Bureau: a) that non-responses are not longer counted as yes-votes and that 60% of yes votes among delivered completed ballots will be sufficient for approval, provided that there is a participation of 60% of the Voting Members; b) that the post as officer of ICS is limited to eight years and the position of Chairman to one term, but for the sake of continuity the chairperson should have been one of the elected bureau members during the precedent term (4 years); c) the ICS Bureau will include five voting members: Chairman, 1st ViceChairman, 2nd ViceChairman, Vice-Chairman at Large (appointed by the other officers of the Bureau in consultation with the members of the Full Commission and Preparatory Committee of the next IGC) and Secretary General. These changes were voted at the end of 1996. The ISSC Chairman



voted for the approval, excepting the provision indicating that the ISC chairperson should have been one of the elected bureau members during the precedent term.

Importance of GSSPs for the stability of boundary definitions.

As informed in ISSC Circular # 91 some problems have arisen with the boundary at the base of the Pleistocene. This problem was considered during the ISC meeting at Beijing. The ICS agreed that the stability of agreed boundaries and GSSPs should stand. Until a complaint is received about any GSSP, ICS will do nothing. It was also agreed that very strong scientific reasons are needed to consider changing established and ratified GSSPs.

Subcommission on the Stratigraphy of the terminal Proterozoic System. At the end of 1996 ICS had a ballot on the transformation of the Working Group on the Terminal Proterozoic System and part of the Subcommission on Precambrian Stratigraphy into an independent Subcommission. I cast an abstention as I did not have information about the position of the Subcommission on the Precambrian on this issue.

## **IX. MISCELLANEOUS**

### **A. “Chronostratigraphy: advances in problem exposition and solution”.**

Professor Henk de la R. Winter has requested that the following seven statements be aired for deliberation:

In his words: “I wish to enclose the outcome of some discussions on the nature and practical application of chronostratigraphy to all rocks, especially rocks older than the Mesozoic where biostratigraphy is of little practical application. Revision of several fundamental principles of stratigraphic classification and procedure is involved, and because it is necessary for practical application to economic geology, I am sure it will be applied in future whether approved by ISSC or not, just as most petroleum geologists have applied sequence stratigraphy for economic reasons. The chief principles and procedures to be considered as to their validity are: 1) That conversion of lithostratigraphy to chronostratigraphy employing interruptions in depositional sequence is the essence of sequence stratigraphy; 2) That the UBU category must include minor interruptions in deposition, when it becomes a regional type of chronostratigraphy; 3) That chronostratigraphic and lithostratigraphic categories are limited to tectonostratigraphic terranes and cannot be correlated globally; 4) That geochronometry is the calibration technique converting the relative geochronologic equivalents of chronostratigraphic units to an approach to physical time; 5) That the GSSP method is a chronocorrelation exercise towards other tectonostratigraphic terranes, achieved by calibration of biostratigraphy, eustatic cyclicity, geochronometry and other categories to the chronostratigraphy of that terrane. Such chronocorrelation is a chronometric procedure; 6) That global chronocorrelation is achieved by global correlation of synchronous portions of tectonostratigraphic terranes, and is a chronometric procedure; 7) That global geologic time scales are also chronometric and only as accurate as the global chronocorrelation, therefore never as detailed as the constituent individual terranes, but essential to global geochronologic mapping.

## **X. PUBLICATIONS ON STRATIGRAPHIC CLASSIFICATION.**

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.

Winter, H. de la R., 1996. Chronostratigraphy: advances in problem exposition and the solution. Geobulletin, Geol. Soc. S. Afr. 39 (1): 13-15.

Winter, H. de la R., 1996. Letter to Editor. Geobulletin, Geol. Soc. S. Afr. 39 (2): 27-28. (It deals with discussions on the nature and practical application, especially to the Precambrian, of chronostratigraphy].

## **XI. MEMBERSHIP MATTERS**

In order to update the ISSC membership list I would appreciate receiving from each organizational member -national or multinational stratigraphic committees, commissions, etc.- a list of its officers and the name and address of the representative of such committees or commissions to whom I should mail the ISSC circulars. Additional information on their activities are also welcome and I will be glad to include them in future ISSC circulars.

I would also like to ask the Individual Members to update their addresses, and if possible to include e-mail, telephone and fax where they could be reached.

**Notice: An active participation of all individual and organizational members is fundamental for ISSC activities.**

**APPENDIX A (TO ISSC CIRCULAR NO. 92)  
SHORT VERSION OF THE GUIDE**

**APPENDIX B (TO ISSC CIRCULAR NO. 92)  
ACTIVITIES OF THE WG ON SEQUENCE STRATIGRAPHY**

**APPENDIX C (TO ISSC CIRCULAR NO. 92)  
DRAFT AND QUESTIONNAIRE ON THE GLOBAL STRATIGRAPHIC CHART**

**APPENDIX D (TO ISSC CIRCULAR NO. 92)  
EVALUATION OF THE ICS ACTIVITIES  
(by A. C. RICCARDI, ISSC Chairman)**