engineering works. Natural gas hydrates, first reported from the U.S.S.R. and most recently from the Mackenzie Delta, possess ice-like physical and electrical properties that make possible their detection by appropriate logging methods. These are now being developed in Canada.

In the session on applied permafrost hydrology and erosion two papers described the effect of permafrost on costal erosion. The first described the coastal defence measures recently installed at Tuktoyaktuk in an attempt to minimize coastal erosion. These defences appear to offer some promise of success but are susceptible to vandalism and have not yet stood the test of time. The second was a fascinating description of the upset of the permafrost regime resulting from river diversion works within the southern fringe of the discontinuous zone. Up to 35 m of shoreline erosion occurred on Southern Indian Lake in northern Manitoba.

The session on arctic construction was hampered by the absence of some of the Soviet papers. A paper from CRREL outlined the problems of tunnel entrances in permafrost primarily because of the change in the thermal regime. A paper was presented on permafrost and applied aspects in Spitzbergen where some novel and successful methods of coping with this problem have been developed.

Four papers from the People's Republic of China evoked widespread interest. Permafrost exists in 22 per cent of the country - the Northeast, Tibet and the Northwest. The Chinese are carrying out fundamental and engineering field studies as well as laboratory work. One paper surveyed the experimental research on properties of freezing and frozen soils in China. Three field studies described tests on an experimental roadbed over thick ground ice in the Chinghai-Tibet region, the performance of an embankment at the lower limit of alpine permafrost in the Northeast, and two pile test sites in permafrost in Chinghai-Tibet in thick continuous permafrost.

Field Trips

Three field trips to various parts of northern Canada took place immediately after the Conference: Yukon-Alaska, the Lower Mackenzie Valley and Northern Manitoba-District of Keewatin. Three others were cancelled because of low enrolment.

Conclusion

There were two main items at the closing plenary session. The United States invitation to hold the Fourth International Conference on Permafrost at the University of Alaska in about five years time was accepted. The matter of an international permafrost association was raised. The National Research Council agreed to investigate the possibilities by establishing an *ad hoc* secretariat and canvassing the international permafrost community to determine interest. The structure of the association, relations with other similar groups, relation of national committees to an international association and other items will have to be determined.

The Proceedings of the Conference are published in two volumes of submitted papers, review papers, banquet speech, poster sessions, exhibitors, films, open and closing plenary sessions. Volume I was published before the Conference and Volume II will be published in June 1979. Guides (written in English, French and Russian) of the six field trips will be published in the summer of 1979 as part of the Proceedings. English translations of the three Russian review papers and 49 submitted Russian papers (plus one French paper) will be published and sold separately in the summer of 1979.

Information concerning the published record of the Conference can be obtained by writing to:
Conference Services Office, National Research Council of Canada, Building M-58, Ottawa, Ontario K1A 0R6

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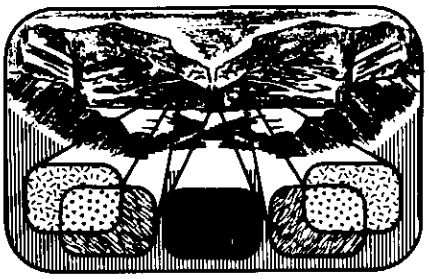

Comments Invited for Revision of American Stratigraphic Code

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Introduction

The American Commission on Stratigraphic Nomenclature (ACSN) is embarking on a thorough revision of the American Stratigraphic Code. The purpose of this note is to elicit the assistance and suggestions of interested geologists throughout North America whom the Commission seeks to represent.

Need for Revision

The current Code (ACSN, 1970) is but a slightly revised version of the Code written largely in 1960 and earlier (ACSN,1961), incorporating some minor amendments adopted by the Commission between 1962 and 1969. Although the present Code has served the profession admirably for almost two decades and has been drawn upon heavily for codes prepared in other parts of the world, it reflects the state of science at the time of its preparation. New tools and concepts developed during the past two decades have revolutionized the earth sciences. Seismostratigraphy and magnetostratigraphy, unrecognized then, are helping now to define the geometry and history of earth materials. Improved capability to drill at great water depths is helping to develop the framework of oceanic stratigraphy. The concept of subduction has led to recognition of both the complexity and significance of mé-

langes. Yet the special needs of workers in these various fields are inadequately addressed by the current Code.

There are also deficiencies in meeting the changing needs of longer established specialties. Students of the Precambrian and of the Quaternary consider that the Code tends to constrain resolution of their problems. Some geologists working in high-grade metamorphic, in plutonic and in some volcanic terranes believe the code hampers definition of rock bodies with important genetic or structural connotations. Paleontologists, too, are concerned that improved biostratigraphic precision and heightened awareness of paleoecology are inadequately served.

Important activities of numerous international bodies are necessarily unrecognized in a Code prepared earlier; updating is desirable. Recent publications by the International Subcommission on Stratigraphic Classification (ISSC) of the International Stratigraphic Guide (ISSC, 1976) brings to fruition extended but continuing efforts of a group within the Commision on Stratigraphy of the International Union of Geological Sciences (IUGS), greater harmony between the Code and the Guide seems desirable. Working groups of the IUGS Commission are engaged cooperatively with the UNESCO International Geologic Correlation Program (IGCP) in defining stratotypes for world wide chronostratigraphic units based on the point-boundary stratotype concept, all unacknowledged in the Code. The IUGS Subcommission of the Precambrian is seeking agreement on Precambrian sub-divisions based on factors other than those used for the Phanerozoic; this, too, merits attention.

ACSN Actions

ACSN responses to the foregoing problems have been varied, as reflected in the numerous Notes of the Commission published during the past decade in the Bulletin of the American Association of Petroleum Geologists. For example, magnetostratigraphic units are discussed by Oriel and others (1976), plutonic and high-grade metamorphic units by Sohl (1977), and oceanic units by Sohl (1978); point-boundary stratotypes are discussed by Macqueen and Oriel (1977). Other matters considered are mentioned in Notes dealing with Records of the Commission.

Awareness of the significance of international activities is reflected by appointment of a standing ACSN committee for IUGS liaison and by Commission representation on ISSC, as well as on other IUGS subcommissions and working groups.

Publication by ISSC of the International Guide resulted in adoption of the following resolution (Caldwell and Sohl, 1978):

> The ASCN hereby endorses the *International Stratigraphic Guide* as the accepted international standard of stratigraphic classification, procedure, and terminology. The concepts and principles embodied therein are endorsed with the recognition that advances in scientific knowledge will lead to their modification.
>
> The *American Code of Stratigraphic Nomenclature* with its amendments will continue as the embodiment of principles and practices developed in North America and as a suitable means of promulgating new concepts, principles, and practices which subsequently may be found worthy of inclusion in the *International Stratigraphic Guide*.

Of relevance here is the resolution adopted at the November 8, 1977, ACSN meeting confirming an earlier ballot by mail " . . . that the ACSN now proceed to undertake substantial revision of the Code, involving some rewriting and incorporation of Notes, etc., that postdate the 1970 reissue."

Revision Plan

The general plan for revising the Code was developed in a report of the ACSN IUGS Liaison Committee, J. D. Aitken chairman, prepared in 1977 for the Commission but not for publication, to preclude its being cast in concrete. The plan recommends appointment and participation of a Code Committee, three principal subcommittees and several advisory groups.

The responsibilities of the Code Committee are direction and overall coordination as well as ultimate assembly and preparation of an integrated manuscript for the revised Code. Principal responsibilities for writing will rest with the three Subcommittees on Lithostratigraphic, Biostratigraphic and Chronostratigraphic Units. Advisory Groups established to deal with the implications of specific geologic problems to the Code are to be independent of individual subcommittees but to advise all subcommittees and the Code Committee.

The plan recommended a three-year timetable involving numerous specific steps to assure widespread participation. Procedures established for staffing the committees and groups have resulted in the following appoints:

Code Committee. Steven S. Oriel (USGS), chairman; Huber Gabrielse (GSC), William W. Hay (Univ. Miami), Frank E. Kottlowski (N. Mex. Bur. Mines), John B. Patton (Ind. Geol. Surv.).

Lithostratigraphic Subcommittee. James D. Aitken (GSC), chairman, Mitchell W. Reynolds (USGS), Bruce V. Sanford (GSC), Robert J. Weimer (Colo. Sch. Mines), Malcolm P. Weiss (N. Ill. Univ.).

Biostratigraphic Subcommittee. Allison R. (Pete) Palmer (SUNY-Stony Brook), chairman, Paul Copper (Laurentian Univ.), Ismael Ferrusquia V. (Univ. Mex.), Joseph E. Hazel (USGS), Erle G. Kauffman (Univ. Colo.), Walter C. Sweet (Ohio State Univ.), Karl M. Waagé (Yale Univ.).

Chronostratigraphic Subcommittee. Zell E. Peterman (USGS), chairman; Zoltan de Cserna (Soc. Geol. Mex.), Edward H. Schultz (Sun Oil, Calgary), Norman F. Sohl (USGS), John A. Van Couvering (Am. Mus. Nat. Hist.).

Plutonic-Metamorphic Advisory Group. Jack E. Harrison (USGS), chairman; John B. Henderson (GSC), Harold L. James (ret.), Leon T. Silver (Cal. Tech.).

Magnetostratigraphic Advisory Group. Roger W. Macqueen (Univ. Waterloo), chairman, G. Brent Dalrymple (USGS), Walter F. Fahrig (GSC), J. M. Hall (Dalhousie Univ.).

Advisory Group. Darrel S. Cowan (Univ. Wash.), chairman, Thomas W. Donnelly (SUNY-Binghamton), Michael W. Higgins (USGS), David L. Jones (USGS), Harold Williams (Memorial Univ., Newfoundland).

Quaternary Advisory Group. Norman P. Lasca (Univ. Wisc. - Milwaukee), chairman, Mark M. Fenton (Alberta Research Council), David S. Fullerton (USGS), Robert J. Fulton (GSC), W. Hilton Johnson (Univ. Ill.), Paul F. Karrow (Univ Waterloo)

Although the IUGS Liaison Committee report noted "The format, language, and style of the existing Code need not be considered rigidly binding, but should be followed to the greatest extent practicable," an objective of the revision is to make the American Code as harmonious as possible with the International Stratigraphic Guide.

Participation by Profession

A purpose of this announcement is to invite the participation, comments, and discussion of all interested earth scientists just as was done before the last Code was prepared (Frye, 1958). Free exchange of ideas, data, and needs can only improve the ultimate product.

Members of the committees and groups are listed above to promote direct communication.

Formal discussions of the current Code or of any published Notes of the Stratigraphic Commission intended for publication should be sent to the Chairman of the Commission so that the ACSN may consider their approval for publication at its next annual meeting.

Open Forums are being scheduled during the annual meetings of both the Geological Society of America (in San Diego on Monday, November 5, 1979) and the American Association of Petroleum Geologists (in Denver, June 1980) to foster informal discussion and comment. Slide and overhead projection facilities will be available for oral presentations; corresponding written submittals should be furnished to the subcommittee chairman concerned one month before the meetings (October 1 for GSA).

Members of the profession will also have ample opportunity to comment on a published draft of the revised Code before it is adopted by the Commission. Until then, the current Code (ACSN, 1970), as amended by subsequent Notes approved by the Commission remains in effect.

Acknoledgements

The participation of Steven S. Oriel in preparation of this note is gratefully acknowledged.

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