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STEPS TAKEN FOR THE STANDARDIZATION OF STRATIGRAPHIC NOMENCLATURE AND GEOLOGIC SYMBOLS IN AUSTRALIA

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History of the Australian Code of Stratigraphic Nomenclature

The Australian Code of Stratigraphic Nomenclature had its origin in the discussions in Melbourne during the early post-war years of a small group of interested stratigraphers - Dr. H.G. (now Sir Harold) Raggatt, Dr. M.F. Glaessner, Dr. C. Teichert and Dr. D.E. Thomas. Prior to World War 2 stratigraphic nomenclature in Australia was, to say the least, unsystematic. Practically any formation observed in the field was called a 'Series', and many of these were not defined in terms of thickness, content, extent, boundaries, relationship to adjacent formations etc. This state of affairs was naturally a source of worry to geologists engaged in systematic stratigraphic work, but up to this time no rules had been formulated for stratigraphic nomenclature, nor was there any general agreement about what system should be used.

At its 1946 meeting, the Australian Association for the Advancement of Science set up a Research Committee on stratigraphic nomenclature, and in 1947, on the recommendation of this Committee, it established a Standing Committee on Stratigraphic Nomenclature. This committee consisted of a member from each of the State Geological Surveys and from the Commonwealth, and one from each State University Geology Department, with power to co-opt. The group mentioned above, acting for the Standing Committee, formulated the earliest edition of the Australian Code, after a study of the Codes in use in the U.S.A. and Canada. This was discussed with other members of the Standing Committee, and with interested geologists, and published in the Australian Journal of Science (Glaessner, Raggatt, Teichert and Thomas, 1948). Discussion was invited, copies of the preliminary Code and the papers on which it was based were made available for distribution through the Bureau of Mineral Resources, and the formal First Edition of the Australian Code of Stratigraphic Nomenclature (Raggatt, 1950) was published, again in the Australian Journal of Science. This edition of the Code was somewhat enlarged from the earlier one, with more explanation, and was divided into numbered paragraphs known as Articles, each consisting of a 'Rule' and 'Comment'. A procedure was recommended to ensure observance of the Code as widely as possible.

Further information on the application of the Code was published in the Australian Journal of Science (Raggatt, 1953) and a second (revised) edition in 1956 (A.J.S., 1956a), which did not differ in substance from the earlier one, but in which the setting out and explanation were improved.

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In 1956 the ANZAAS Standing Committee considered that it had "completed its task of preparing a code of stratigraphical nomenclature and ensuring its acceptance by Australian geologists" (A.J.S., 1956b), and recommended that it be discontinued and that the recently-formed Geological Society of Australia be requested to carry on its functions. This recommendation was accepted. The Stratigraphic Nomenclature Committee now consists of a Convener and seven Divisional Sub-committees - one for each State and one for the Commonwealth Territories - each Subcommittee consisting generally of one geologist from the State Geological Survey, one representing the University (or Universities) and one representing companies and other organizations that employ geologists. It continued to publish revisions of the Code in the Journal of the Geological Society of Australia.

In the third edition (J.G.S.A. 1959) the definition of Group was changed, some minor alterations in wording were made and the attempt to define the age of the boundary between Archaean and Proterozoic was abandoned. The fourth edition was published also in the Journal of the Geological Society of Australia (J.G.S.A. 1964). The setting out of the Code was rearranged, some articles were clarified and a general revision made in the light of experience in the application of the principles enunciated in the code. The Code is constantly under review and further revisions will be published as the necessity arises.

Steps taken to establish observance of the Code

The early editions of the Code were published in the Australian Journal of Science (1948, 1950, 1953, 1956), and the third and fourth editions in the Journal of the Geological Society of Australia (1959, 1964), both of which, particularly the latter, have very wide circulation amongst Australian geologists. The Bureau of Mineral Resources obtained large numbers of reprints of the first three editions and distributed these widely to Universities, State Geological Surveys, companies and other organizations employing geologists, and to anyone who applied for a copy. In addition the Secretary (later called the Convener) of the Stratigraphic Nomenclature Committee circularized the institutions mentioned above urging observance of the Code and wrote to the editors of all publications in Australia which include geological papers in their volumes and asked them to request authors submitting papers for publication to ensure that their stratigraphic nomenclature was in accordance with the Code, and to refer any problems to their Divisional Nomenclature Sub-committee. This request was repeated at intervals and in general the response has been extremely good. Divisional Sub-committees have been active in promulgating the use of the Code, and reference to it is included in the curriculum of the Geology Departments of the Australian Universities, so that at least all the geologists educated in Australia are familiar with it.

All editions of the Code have included information on how to obtain advice on its application. The procedure generally has been to refer questions to the Divisional Sub-committee, and if the author and the Sub-committee were unable to agree, the matter would be submitted to the Convener, who would place it before the full Committee.

Following are the functions of the Convener, the full Committee and the Divisional Sub-committees:

1. Election

The Convener/Secretary of the Committee is appointed by the Council of the Geological Society. The Convener may or may not be a member of a Divisional Sub-committee. The Stratigraphic Nomenclature Sub-committee for each Division is elected by financial members of the appropriate Division at the Annual General Meeting; the Sub-committee normally consists of three members, one of whom becomes the Secretary of the Sub-committee. The Divisional Sub-committees together with the Convener constitute the Stratigraphic Nomenclature Committee of the Geological Society of Australia.

2. Functions of Convener

(i) To call meetings of the Committee and to arrange agenda for meetings.

(ii) To co-ordinate the work of the Committee; to advise on problems connected with the application of the Code, and if necessary to refer such problems to the full Committee.

(iii) To initiate action for revision of the Code or of any of its Articles when the need for such revision becomes apparent.

(iv) To maintain liaison with the central registry of stratigraphic names established by the Bureau of Mineral Resources so that duplication may be avoided.

3. Functions of the Committee

(i) To consider and resolve amendments to the Code of Stratigraphic Nomenclature and problems in Stratigraphic Nomenclature submitted by the Convener.

(ii) To make revisions of the Code or parts thereof.

(iii) To take action appropriate to a Federal Body to encourage adherence to the Code by geologists and by organizations publishing geological literature.

4. Functions of Sub-committees

(i) To consider, and advise on, submissions of new or revised nomenclature for units within the Division's area. The Sub-committee is competent to advise on the name and classification of rock units proposed and should ensure that the name, classification and definition of units follow the

principles of the Code of Stratigraphic Nomenclature. The Sub-committee should ensure that all names are checked with the Central Register in order to avoid duplication of names in use in other States.

(ii) To keep a list of names used in nomenclature within the State in order to avoid duplication of names within the Division.

(iii) To take appropriate action to encourage adherence to the Code of geologists and organizations publishing geological literature within the Division.

(iv) To submit to the Committee comment on problems raised, or amendments to the Code, suggested by meetings of the Division, and comment on proposals for new or revised time-rock or time units.

N.B. The functions of the Sub-committee do not include making decisions on correlation or on the interpretation of field data, although such questions may be referred to the Sub-committee, as an advisory body, should an author wish to do so.

Central Register of Stratigraphic Names

In 1949 the Bureau of Mineral Resources began the compilation of a Stratigraphic Index of the named formations recorded in Australian Geological literature. Stratigraphic information was recorded on base cards, 8" x 5", specially designed for the purpose. Cross indexes to authors, ages, and map areas were also prepared. This work was done with the co-operation of the State Geological Surveys and Universities, and in fact the South Australian index was compiled by the State Survey, and other State Surveys subsequently appointed staff for indexing. Copies of the index cards for the State were kept at the State Geological Survey and at the University and a complete set for all States and Territories at the Bureau of Mineral Resources, Canberra, which is the basis of the Central Register of Stratigraphic Names.

During 1951 the Bureau undertook the responsibility of compiling Stratigraphic Lexicons as part of the International Stratigraphic Lexicon being prepared by the Commission of Stratigraphy of the International Geological Congress. These were compiled in parts by States and were published as follows:

Fascicule	5a	Queensland 1958
"	5b	New South Wales 1959
"	5c	Victoria (in press)
"	5d	Tasmania 1959
"	5e	South Australia 1958 (compiled by S.A. Geological Survey)
"	5f	Western Australia 1963
"	5g	Northern Territory 1962
"	5h	New Guinea, Solomon Islands etc. (in press).

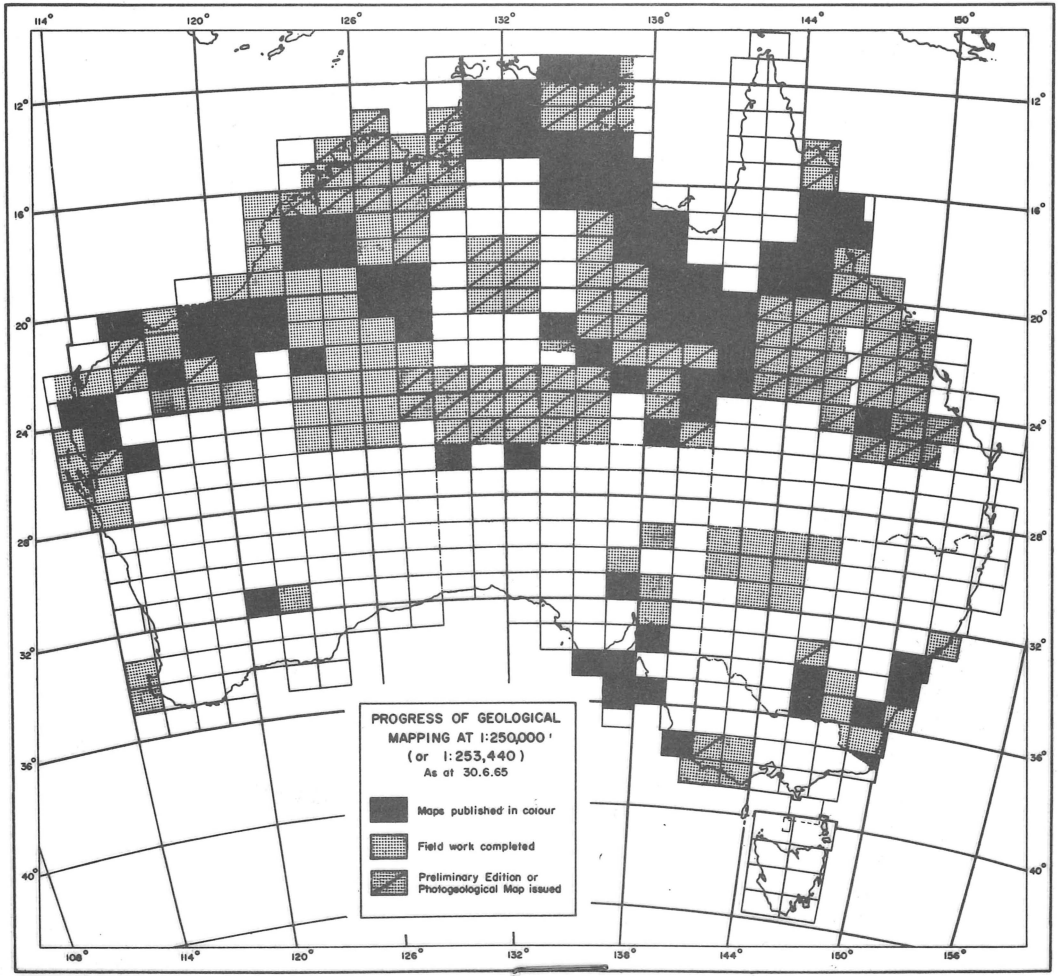

Figure 1

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The Stratigraphic Index and the Lexicons constitute a basic reference from which the Central Register of Australian Stratigraphic Names, which is maintained by the Bureau of Mineral Resources in Canberra, has been compiled. This Register records the first known publication of a Stratigraphic Name (whether it conforms to the requirements of the present Code or not) and any significant appearance of the name since its introduction, the age of the unit, its type locality and characteristic features. This Register is kept up-to-date by comprehensive examination of new publications. Authors are invited to (and nearly all do) check with the Central Register when setting up new unit names, either directly or through their Divisional Sub-committee, to ensure that the names are not already in use. A copy of the reply is always sent to the Divisional Sub-committee for its records.

At two-monthly intervals lists of new names used or proposed, and their authors, are circulated to Divisional Sub-committees, to the Geological Surveys, and to the Heads of University Geological Departments. Recently mining and exploration companies have been added to the distribution list. This all helps to keep geologists in Australia aware of the requirements of stratigraphic nomenclature and to avoid duplication of unit names and other violations of the Stratigraphic Code.

Standardization of Geological Symbols

The steps taken to establish a standard set of geological symbols throughout Australia, together with a uniform colour scheme, were closely related to a combined Commonwealth and State geological map compilation project which was inaugurated after World War 2 by the Commonwealth Government at the instigation of the Bureau of Mineral Resources. Under this scheme a decision was taken to compile a series of geological maps of Australia at standard scales and with uniform colours and conventions. The first decision was that the main series of maps would be at 8 miles to an inch, but this was changed to 4 miles to an inch as a result of the adoption of that scale as the standard mapping scale for Australia. This has since been altered to 1:250,000, which is the present scale of geological map compilation. The main series is supplemented by maps at 1 inch to a mile. The Bureau of Mineral Resources was to be responsible for maps of areas within Commonwealth Territories and would assist States, where required, with the compilation and publication of maps of areas within the States.

Figure 1 shows the progress achieved with this mapping project up to 1965. Much of the field work upon which these maps are based has been carried out by joint geological parties from the Bureau of Mineral Resources and the Geological Surveys of Queensland or of Western Australia.

It was found that there was no uniformity in colour schemes previously used in geological maps published by State Geological Surveys or Universities, and so a standard colour scheme and a system of letter-symbols for geological formations were prepared that were considered to be suitable for portrayal of Australian geology, based closely on the scheme used by the United States Geological Survey. This was examined in close detail by a conference of Government Geologists in 1950, at which the State Geological Surveys and the Bureau of Mineral Resources were represented. The proposed scheme was adopted with some modifications and was later published by the Bureau and distributed to all the State Geological Surveys and also to Universities and other map-printing organizations.

At the same meeting a standard set of geological symbols, also based on those of the United States Geological Survey, was adopted, as well as topographic conventions, following those of the Australian National Mapping Council, symbols for mineral deposits, and lithological patterns for maps in black and white. These also were printed in a booklet and widely distributed. Both the colour scheme and the geological symbols are kept constantly under review, especially by the organizations most active in map publication - the Bureau of Mineral Resources and the South Australian Department of Mines; modifications are suggested where experience shows that they are necessary and ratified by the Conference of Government Geologists which is held generally at intervals of approximately two years.

New editions of the list of standard symbols are printed by the Bureau as the amount of revision justifies it and as stocks of the previous edition become exhausted.

Since 1960 occasional meetings have also been convened of the Chief Draftsmen of the State Geological Surveys and the Bureau of Mineral Resources to exchange information and to discuss problems relating to drafting, reproduction, and printing of geological maps, colour schemes, geological representation, the use of screens, colour separation, and the development of drafting techniques. As a result of the first of these meetings, a duplicated information bulletin "Geologic Cartography", edited by the Chief Draftsman of the South Australian Mines Department, has been issued twice a year; it contains information on mapping progress and programmes and particularly on technical developments in drafting, reproduction, and printing.

Accompanying documents

Accompanying this paper are 50 copies each of the following documents for distribution to each of the delegations to the 3rd Symposium on the Development of Petroleum Resources of Asia and the Far East.

1. Australian Code of Stratigraphic Nomenclature, Fourth Edition 1964, with corrigenda and a note on the Central Register of Australian Stratigraphic Names.

2. Standard Colour Scheme for Geological Maps, including stratigraphic symbols and index sheets of screens available to the Bureau of Mineral Resources, printed in each of the standard colours; issued 1964.

3. Standard Geological Symbols; revised and published 1963.

4. Standard layout for 1:250,000 Geological Map sheet, with typical surround and specifications for map symbols.

5. Copy of Stratigraphic Base Index Card used for recording stratigraphic information.

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