

APPENDIX: REPORT ON THE WORK OF THE
NOMENCLATURE AND LIAISON COMMITTEE
OF THE CLAY MINERALS SOCIETY, 1963-4

by

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Membership: G. W. Brindley (chairman), T. F. Bates, G. T. Faust, S. A. Forman, R. E. Grim, J. C. Hathaway, M. L. Jackson, C. I. Rich, C. S. Ross.

Meetings: One meeting of the Committee was held April 2, 1964, in Washington, D.C., with seven members present. Dr. Michael Fleischer was invited to be present.

Business: The meeting was called to discuss a Report prepared by J. Konta and R. C. Mackenzie summarizing the work of the Clay Mineral Nomenclature Meeting held during the International Clay Conference, Stockholm, August 1963.

Report: The Nomenclature Meeting in Stockholm agreed to a considerable extent with the nomenclature and classification scheme submitted by G. W. Brindley on behalf of the Clay Minerals Society's Nomenclature Committee (1962-3). The Nomenclature Committee (1963-4) had, therefore, a relatively easy task in preparing their reply to the Konta-Mackenzie Report, and their conclusions are summarized in the accompanying Table and appendices.

The basis of the Classification Scheme developed by the 1962-3 committee, largely approved at the Stockholm Meeting, and confirmed by the 1963-4 committee, is that a classification of clay minerals cannot be developed independently of a classification of layer silicates (phyllosilicates). Therefore the classification scheme contains minerals not normally regarded as clay minerals (e.g. margarite) and omits some commonly used clay-mineral terms because of lack of adequate definition at the present time, or because their nature is such that they do not fall within this classification scheme. Some of these omissions are mentioned in a footnote to the Table.

The Committee recommends as column headings the terms *Type*, *Group*, *Sub-Group*, and *Species*. In particular, "sub-group" is preferred to "series", since there are situations in which "series" is used in a more restricted sense, and "sub-group" clearly indicates the relation to "group". The ratios 2:1, 2:1:1, and 1:1 were accepted as Type designations.

The division into *Groups* on the basis of x , layer charge per unit cell, was regarded as generally satisfactory but it was considered that the range of charge in each group should be expressed broadly as shown by the use of the

TABLE 1.—CLASSIFICATION AND NOMENCLATURE OF THE PHYLLOSILICATES*

Type	Group (* = Layer charge)	Sub-Group	Species (representative examples)
	Pyrophyllite-talc * ~ 0	Pyrophyllite	Pyrophyllite
		Talc	Talc
2:1	Montmorillonite-Saponite† * ~ 0.5-1.0 OR Smectite‡ * ~ 0.5-1.0	Montmorillonite	Montmorillonite, beidellite, nontronite
		Saponite	Saponite, hectorite, saunonite
		Diocahedral smectite Triocahedral smectiteas above.....
	Vermiculite * ~ 1.0-1.5	Diocahedral vermiculite	Diocahedral vermiculite
		Triocahedral vermiculite	Triocahedral vermiculite
	Mica * ~ 2	Diocahedral mica	Muscovite, paragonite
		Triocahedral mica	Biotite, phlogopite
	Brittle mica * ~ 4	Diocahedral brittle mica	Margarite
		Triocahedral brittle mica	Seybertite, xanthophyllite
2:1:1	Chlorite * variable	Diocahedral chlorite	Diocahedral chlorite
		Triocahedral chlorite	Pennine, clinocllore
1:1	Kaolinite-serpentine * ~ 0	Kaolinite	Kaolinite-1Tc, kaolinite-D
		Serpentine	Crysotile, lizardite, antigorite

* The status of illite, glauconite, sericite, and kindred terms is such that they cannot be included in this table, but such materials are considered with interstratified (or mixed-layered) materials.

† No agreement was reached on the naming of the group with * ~ 0.5-1.0.

symbol \sim . For the chlorite group, a more precise statement than “ x variable” was considered to be not possible at the present time.

Group names. Of the group names given in the Table, only the group name for 2 : 1 minerals with $x \sim 0.5-1$ gave rise to long debate. The names (i) “smectite”, (ii) “montmorillonite-saponite” and (iii) “montmorillonite” were debated and a first vote gave (i) 3 votes, (ii) 3 votes, (iii) 1 vote. A second vote gave (i) 3 votes, (ii) 4 votes. It was considered likely that the two committee members not present would add one vote to each of these names. The committee was almost equally divided on this question, and accordingly both names are shown in the Table. It was considered that international agreement should be reached as soon as possible on this much-debated question.

The hyphenated names, pyrophyllite-talc and kaolinite-serpentine were unanimously accepted, as also were the single names vermiculite, mica, brittle mica, and chlorite. The division of opinion on the naming of the 2 : 1, $x \sim 0.5-1$ minerals involved not only historical questions, but a preference by some members for a single name analogous to mica and by others for a hyphenated name analogous to pyrophyllite-talc.

Sub-Group names. It was agreed that if the group name is a hyphenated word, the sub-groups should be labelled with the component names, but, if the group name is a single word, the sub-groups should be labelled dioctahedral and trioctahedral.

Species names. It was agreed that the polymorphic forms of kaolinite be described by a symbol to indicate the stacking arrangement of the layers, such as Kaolinite-1Tc (for a well-crystallized kaolinite), Kaolinite-D (for a kaolinite with disordered layer sequence), Kaolinite-2M₁ (for dickite) and Kaolinite-2M₂ (for nacrite).*

It was agreed unanimously that the terms “endellite” and “halloysite” be strongly recommended to C.I.P.E.A. as the most satisfactory way of avoiding confusions.

Miscellaneous Recommendations

1. Illite, Glauconite, Sericite and Kindred Terms.

The 1963-4 Committee agreed that the relation of these terms to the proposed scheme must be indicated.

It was considered that, in the Table itself, attention should be drawn to these terms by means of an asterisk attached to the word “phyllosilicate” in the Table heading.

The Committee unanimously endorsed the following statement in the

* Subsequently, in an open letter to the Committee, S. W. Bailey has argued strongly for a reconsideration of these symbols on the basis of “a systematic derivation of all possible polytypes for 7Å layer silicates, similar to that of Smith and Yoder (1956) for the micas” which he is preparing for publication. It seems likely, therefore, that further consideration must be given to the particular symbolic representation of the kaolinite minerals; however, the general principle is agreed.

Glossary of Geology, American Geological Institute, Washington, D.C. (1957), page 146:

Illite = Glimmerton (Ger) = Hydromica. Names used for a group of clay minerals abundant in argillaceous sediments. They are intermediate in composition between muscovite and montmorillonite; recent studies have shown that many are made up of interlayered mica and montmorillonite.

Additionally the Committee considered that some vermiculite and/or chlorite layers also may be interstratified with such materials.

2. The Naming of Interstratified Minerals.

The following are the views unanimously agreed on by the Committee:

1. The Committee approves generally the system described by Brown (1955) for *irregular interstratified minerals*, such as (for example) chloritic vermiculite, chlorite-vermiculite, and vermiculitic chlorite for minerals in which the amount of chlorite is less than, approximately equal to, or greater than the amount of vermiculite.

2. For *regular interstratified minerals*, the Committee prefers the use of the additional word "regular" to describe these minerals, for example, "regular chlorite-vermiculite".

3. The Committee disfavors special names for interstratified minerals but realizes that *eventually* the *regular* interstratifications may be given special names.

REFERENCE

BROWN, G. (1955) *Clay Min. Bull.* **2**, 294.