

**MINERAL SYSTEMS: A REVIEW  
WITH OUTLINE OF AN  
ATTEMPTED CLASSIFICATION OF  
MINERALS IN NATURAL GROUPS**

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Mineral Systems: A Review with Outline of an Attempted Classification of Minerals in Natural Groups by E. J. Chapman

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**E. J. CHAPMAN**

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## MINERAL SYSTEMS

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**MINERAL SYSTEMS**

**A REVIEW**

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**CLASSIFICATION OF MINERALS**

**IN NATURAL GROUPS**

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**LONDON**

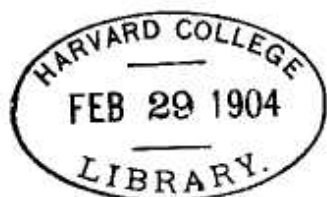
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## PREFACE

APART from certain questions bearing more or less directly on the subject, the present Essay concerns itself entirely with the Classification of Minerals. It is not intended to serve in any way as an introduction to the actual study of Mineralogy: nor, indeed, can its argument be properly understood except by those who have already some knowledge of the subject to which it refers. It is published as a protest against the system of classification now so greatly in vogue, by which Mineralogy is practically dethroned as a natural science; and secondly, in the hope that it may induce some of our younger workers in this field of research to develop, sooner or later, a truly natural system that may be acceptable to all. The writer's own day has gone by for this. The inevitable "Thus far and no farther" that awaits the coming years of all, is, in his case wellnigh reached. In his discussion of past and present classifications, he is constrained, it will be seen, to differ somewhat widely from the views and opinions of others: but, in contesting these views, he has striven to do so without undue discourtesy.



## POSTSCRIPT

On reading over the introductory sections to this Essay, it seemed to the writer to be hardly fair to criticise adversely the mineralogical classifications of others, without affording those who adopt these systems an opportunity of counter-criticism. An Appendix has therefore been added, containing an Outline of a Distribution of Minerals on an essentially mineralogical basis, as proposed by the author—so far, at least, as ingrained prejudices would admit of a departure from the beaten track.

In this Classification, the "Groups," only, are to be regarded as forming part of the Classification proper. The "Series," into which the Groups are collected, are merely given to convey to Readers accustomed to chemical systems a more ready conception of the Classification generally. The Groups, it is maintained, are natural collocations: whilst the Series, as in the Classes and Orders of ordinary Systems, are unavoidably more or less artificial groupings—resembling, in this respect, the commonly adopted subdivisions of Simple Bodies, Sulphides, Oxides, Oxygen Salts, etc., in which minerals the most dissimilar in character and conditions of occurrence find places side by side—such as the *Diamond* and *Native Sulphur*; *Cinnabar* and *Zinc Blende*; *Minium* and *Hausmannite* (as oxides of

the same formula); *Chlorargyrite* ("Horn Silver") and *Rock Salt*; with a host of other incongruous associations: whilst, in these systems also, the enforced separation of many naturally allied minerals, as *Hausmannite* and *Braunite* (often placed, far apart, in different sections), *Hauerite* and *Alabandite*, etc., etc., is equally conspicuous. Critics who may be inclined to regard in too hostile a spirit the author's attempted classification, are asked to answer honestly the following question. Are not the unions and separations, as recorded above—the union, for example, of *Minium* and *Hausmannite* in one and the same subdivision, and the wide separation of *Hausmannite* and *Braunite*—simply indefensible (to use no stronger term) in a classification of *minerals*? And scores of similar cases are involved, unavoidably, in all chemical or chemico-crystallographic classifications hitherto applied to Mineralogy. See the remarks in Sections I. and II. of the present Essay; and those, also, prefixed to the various classification-groups, in Appendix A.

In a *classification of Minerals*, the following points cannot be legitimately ignored:

(1) Two minerals may possess the same molecular constitution (as now understood), and yet, *as minerals*, may have absolutely nothing in common: *e.g.*, to give but one example, *Minium* and *Hausmannite*, placed together, in modern chemical classifications of minerals, as compounds of  $R_2O_4$ .

(2) Two minerals may be alike crystallographically,

and yet, *as minerals*, may be totally distinct in composition and all other characters: *e.g.*, *Augite* and *Borax*, *Anatase* and *Mercury Chloride*.

(3) Two minerals may be alike both in constitution and crystallization, and yet *as minerals*, if viewed in their entirety, may lie far apart: *e.g.*, *Hauerite* and *Pyrite*; *Laurite* and *Pyrite*; *Wollastonite* and *Pyroxene*; *Euclase* and *Gadolinite*, etc., etc.

(4) Many elements and their compounds are known to occur under different conditions as regards crystallization and other characters. It is more than probable, therefore, that every chemical body is capable of crystallizing in distinct systems, and of assuming other distinct conditions.

(5) The condition of an element, or elementary body, in composition with other matters, is evidently in many cases, and probably in all, totally unlike the ordinary conditions which the substance presents in its free or uncombined state. Hence, in classification, a mineral cannot properly be regarded as only the natural embodiment of a chemical conception, but should be viewed as regards itself, alone—*i.e.*, as a natural inorganic body—apart from all abstract considerations.

(6) In many chemical subdivisions—perhaps, it may eventually be found, in all—certain recurrent types occur: identical in crystallization, but quite distinct in general character and actual composition; and hence, *as minerals*, not properly referable to the