COMPLETE

MINERAL CATALOG

FOOTE


OF·GEMS·&c
GEM·CUTTING
GEMSTONES·OF·NORTH·AMERICA·PROSPECTING·FOR·GEM
STONES·AND
MINERALS
MINERALOGY·EMERALD·AND·OTHER·BERYLS·CATALOG
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KAS

Compliments of

W. M. FOOTE

COMPLETE MINERAL CATALOG

Compiled by W. M. Foote

PART I

Mineral Collections and Material for the Laboratory

PART II

Descriptive Account of Choice Specimens. Meteorites. Price List of Individual Specimens. Classified Table of Minerals according to Dana's System, with Index. Metallurgical Classification of Minerals

Rare Minerals for Manufacturing Purposes Supplied in Commercial Quantities

See Page 98

216 Pages, Illustrated

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Price Lists and Mineral Collection Catalogs free

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PART I.

PART II.

Note.

In this new edition of our catalog of collections, the various lists have been corrected and revised to accord with the latest and most practical educational requirements, and similarly, with the steady growth of our large stock.

Some idea of the increased store of material at hand is given in the enlarged "Complete Type Collection List" of fifteen hundred specimens. Excellent examples of these and several hundred others are offered in sufficient numbers to afford a wide choice. This is three times as extensive as any similar list published, indicating the extent and variety of the largest stock of minerals in the world. An increasing demand has been noted for the most advanced scientific collections down to the smallest elementary sets, and more efficiently than ever is this demand met with the best and most representative material obtainable. We are constantly receiving appreciative and commendatory letters, and take pleasure in referring to leading teachers and curators of mineralogy.

CABINET SPECIMENS are in one department. EDUCATIONAL SPECIMENS (under one dollar each) in another. LOOSE CRYSTALS are carefully described and arranged in separate cases. They are thus easily examined without the hindrance of a mass of unsought-for material.

A marked improvement has been made in the average quality of the specimens used, while the inclusion of numerous valuable minerals by revision of the collections has added materially to their usefulness. The minimum size for good study specimens averages 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.). Collections in smaller sizes are no longer kept in stock. Prepared to order singly, they cost the same as the student's size.

We have discontinued buying of or selling to other general mineral dealers, giving assurance that what we supply is from direct sources. Accessions come largely from our traveling collectors, or correspondents, at the localities. Our free delivery in all countries saves customers paying the profit of a local middleman or broker.

Free Delivery Throughout the World.

On orders over $20, catalog prices include packing and transportation at our risk, to any address in the world reached by railroad or steamship line.

Prices are net. No discounts. The "one-price system" wins universal favor.

Terms are cash with order, but those known to us may pay on delivery. Public institutions pay in conformance with their appropriations.

Money Refunded on any item promptly returned.

Approval Consignments, valued over $20, are sent for examination, carriage prepaid, to institutions or responsible individuals. Rejected items to be returned, carriage prepaid.

We received the

Highest Award

and medal given for

COLLECTIONS OF MINERALS

FOR EDUCATIONAL PURPOSES

At Expositions held
in the following cities:

PHILADELPHIA, 1876
CINCINNATI, 1881
NEW ORLEANS, 1884-85
NEW ORLEANS, 1885-86
LOUISVILLE, 1886
LONDON, 1887
PARIS, 1889
PARIS, 1900

PLATE II.

SAMPLE MUSEUM OR EXHIBITION SIZE SPECIMEN. LABELING AND MOUNTING ON IMPROVED BLOCK.

Museum or Exhibition Size Specimens.

AVERAGING 12 x 9 CM. ($4\frac{3}{4}$ x $3\frac{1}{2}$ IN.).

Plate III shows the average size of specimens listed by us for private or public museums, for the school or college class room, or for office or laboratory display, where large examples of showy appearance are desired. While intended for glass cases, as shown in Plate IX, they may be conveniently held in smaller space in a drawer cabinet fitted with pasteboard trays, the drawer being 9 cm. deep. In ordering this size it should be mentioned if trays are wanted instead of blocks. Either are supplied free. In preparing collections in the museum size, especial attention is paid to the neat shaping of each individual, and the selection of bright colors and striking crystallizations, wherever this can be done without impairing the representative character of the collection.

OUR IMPROVED BLOCK for mounting specimens is shown in Plate II. It is made of extra heavy pasteboard, covered with fine white paper, glazed to resist dust. There are marked advantages of this neat and light paper block over the old-fashioned and sombre wooden one. Varnished wood of any color fails to display the average specimen in the highly effective manner secured by a simple white background. The interior of the case may, however, be in natural color. The uniform depth of the mount is: Top, 9 cm. ($3\frac{1}{2}$ in.); base, 13 cm. (5 in.); slanting front, $4\frac{1}{4}$ cm. ($1\frac{5}{8}$ in.). The length is 16 cm. ($6\frac{1}{4}$ in.) and the height $2\frac{1}{4}$ cm. ($\frac{7}{8}$ in.). Wooden blocks substituted without charge, if ordered.

THE MAXIMUM LIMIT of this size is shown by the pasteboard tray in Plate III. 16 x 12 cm. ($6\frac{1}{4}$ x $4\frac{3}{4}$ in.). Many showy specimens are over size, giving the collections as a whole the appearance of being larger than advertised.

THE WEIGHT, packed for shipment, averages 1100 grams (about $2\frac{1}{2}$ lbs.) per specimen. It is about five times as large as the student's size and costs four times as much.

Any desired size can be prepared on order, the price roughly varying with volume, our high standard of quality being always the same. An extra labor cost is, however, incurred in specially prepared sizes.

Student's Size Specimens.

AVERAGING 7 x 5 CM. ($2\frac{3}{4}$ x 2 IN.).

Plate IV shows the average size of the individuals forming our various collections for study. The representative character of the specimens in illustrating physical properties and crystallization is considered of prime importance, but incidentally many of the specimens are of attractive appearance.

DRAWER CABINETS fitted with pasteboard trays offer the best means of keeping the specimens, the drawers being 5 cm. (2 in.) deep. PORTABLE CABINETS are lighter. See next page.

THE MAXIMUM LIMIT of this size is shown by the dimensions of the pasteboard tray. Many specimens reach this limit, the collections thus appearing larger than advertised.

OUR PASTEBOARD TRAYS are admittedly the best. It is impossible, without them, to keep labeled specimens in drawers, except in a state of hopeless disorder and confusion.

To meet this universal need we present with each specimen one of our standard pasteboard trays, covered with white glazed paper, and strengthened with inner linen binding. To display the specimen and label to the best advantage, a simple and effective method is to reverse the tray. (Plate IV.) The outside measurement is 8 x 6 x $1\frac{1}{2}$ cm. (about $3\frac{1}{8}$ x $2\frac{3}{8}$ x $\frac{5}{8}$ in.).

THE WEIGHT, packed for shipment, averages 225 grams (about $\frac{1}{2}$ lb.) for each specimen.

SMALLER SIZES are not kept in stock. Prepared to order, they cost the same as above. However, when a number of small size collections are ordered at the same time, the labor cost is much decreased.

MASSIVE FRAGMENTS are sold by weight. (See Laboratory List.)

If preferred, the student's size specimens may be broken into about a half-dozen $2\frac{1}{2}$ cm. (1 in.) fragments.

PLATE III.

SAMPLE MUSEUM OR EXHIBITION SIZE SPECIMEN
IN PASTEBOARD TRAY.

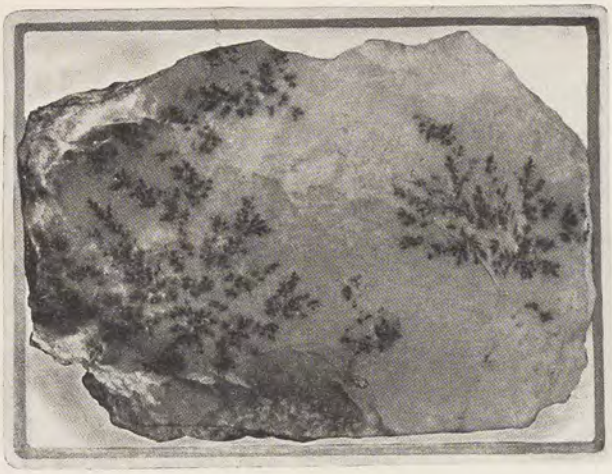


PLATE IV.

SAMPLE STUDENT'S SIZE SPECIMEN

IN PASTEBOARD TRAY.

SPECIMEN AND LABEL DISPLAYED ON REVERSED TRAY.

Drawer-Cabinets

When containing collections prices include delivery. If bought separately transportation is at buyer's expense.

The purchaser of a mineral collection finds it impossible to buy ready-made, a cabinet of shallow drawers. To meet this want at a reasonable cost, we have our Mineral Drawer-Cabinets made up in quantities, according to our own latest designs. They are planned to just hold the student's size specimens. A single cabinet made to order would cost more than our price, which includes delivery. A handsome and well-finished quartered oak is used, and the workmanship is of the best, with a view to securing a neat and strong cabinet in as compact a form as possible. Fitted with antique-metal knobs.

The drawers all measure, inside, 56 x 36 x 5 cm. ($21\frac{7}{8}$ x $14\frac{1}{4}$ x 2 in.), and each holds forty-two pasteboard trays measuring 8 x 6 cm. ($3\frac{1}{8}$ x $2\frac{3}{8}$ in.).

(Drawer-Cabinets made to order in mahogany cost one-third more.)

36-Drawer-Cabinet, measuring 130 x 138 x 46 cm. (51 x 54 x 18 in.). See Plate V. For 1500 specimens, $50.

14-Drawer-Cabinet, measuring 67 x 111 x 46 cm. ($26\frac{1}{2}$ x $43\frac{1}{2}$ x 18 in.). Similar to the one illustrated in Plate VI. Holds about 600 specimens, $20.

9-Drawer-Cabinet, measuring 65 x 74 x 45 cm. ($25\frac{1}{2}$ x 29 x $17\frac{1}{2}$ in.). Plate VI. Holds about 400 specimens, $15.

5-Drawer-Cabinet, measuring 65 x 42 x 45 cm. ($25\frac{1}{2}$ x $16\frac{1}{2}$ x $17\frac{1}{2}$ in.). Plate VII. For 210 specimens, $9.

3-Drawer-Cabinet, measuring 65 x 28 x 45 cm. (25 x 11 x $17\frac{1}{2}$ in.). Plate VIII. For 126 specimens, $6.

Portable Cabinets

Made extra strong, but light, especially for prospectors or travelers. Same good material, workmanship and finish as the above. Hinged lid and improved metal catches.

200-Specimen-Portable-Cabinet. For student's size specimens in pasteboard trays (178—8 x 6 cm. and 22—4 x 6 cm.). One fixed wooden tray in bottom and two removable wooden trays. Weight about 15 kilos (33 lbs.). Measures 78 x 49 x 19 cm. (31 x $19\frac{1}{2}$ x $7\frac{1}{2}$ in.), $9.

126-Specimen-Portable-Cabinet, with one fixed wooden tray in bottom and one removable wooden tray. Weighs about 11 kilos (24 lbs.). Measures 78 x 49 x 13 cm. (31 x 19½ x 5 in.), $6. See Plate VIII.

60-Specimen-Portable-Cabinet. Weighs about 5 kilos (11 lbs.), measuring 74 x 33 x 6½ cm. (29½ x 13¼ x 2½ in.), $3.

25-Specimen-Portable-Cabinet. Weighs about 2 kilos (4½ lbs.), measuring 48 x 33 x 6½ cm. (16½ x 13 x 2½ in.), $2. See Plate X.

Glass lid instead of wood, in any portable cabinet, $1.50 extra.

Glass Wall-Cases

For displaying museum-size specimens. Finely finished quartered oak.

1500-Specimen-Cases. Can be made up to order, following any plain design specified, $500.

600-Specimen-Cases. Same, $200.

400-Specimen-Cases. Same, $120.

200-Specimen-Cases. Two cases similar to, but larger than that shown in Plate IX. Each case holding 100-specimens, $75.

125-Specimen-Cases. Two cases (60 to 65 specimens) like that shown in Plate IX, $60.

60-Specimen-Case. Measures 74 x 138 x 36 cm. (29 x 54 x 14 in.), $30.

25-Specimen-Case. Measures 112 x 153 x 36 cm. (44 x 60 x 14 in.) See Plate XIII, $15.

Mineralogy in Mining Schools.

The individual variation in species which is so important a consideration in biological study, is of no less weight to those who would recognize the innumerable forms of the mineral world. The student who has mastered a few hundred specimens may have been warned that they represent but the commoner types. Yet in the field new and unknown varieties confuse and puzzle him at every turn.

Practice in the examination of widely varying types means a fuller acquaintance with minerals, as well as increased power of observation.

This idea is incorporated in the curriculum of the mining schools, where a course in mineralogy includes constant drill in the identification of innumerable minerals by sight and by the quick tests applicable in the field.

As complete a collection as possible should be selected. The rarer specimens may not be carefully studied, but will occasionally be invaluable for reference. It is better to risk having too extensive a collection than one which is inadequate.

PLATE V.

THIRTY-SIX-DRAWER CABINET (1500 SPECIMENS).

Containing No. 3A.

PLATE VI.

NINE-DRAWER CABINET (378 SPECIMENS).

Containing Nos. 11A or 24B.

Standard Collections.

A professor of mineralogy at one of the oldest seats of learning in Europe, speaking of an order about to be placed with us, said: "I want good working specimens—I like this Opalized-wood because it shows plainly that it is a petrifaction, and this Calcite because it does not need a pointer to call attention to its form." That is precisely the aim of our collections. Throughout, they illustrate the subject, a thing which poor or carelessly selected specimens can never accomplish.

Correct labeling is of the highest importance. Selection of specimens and labeling is done under the direct supervision of our experienced mineralogists. As a precaution against the misplacing of labels, the specimens have numbers attached, corresponding to a numbered list. A welcome innovation is the sending of a pasteboard tray with every specimen. This is essential to orderly arrangement. A neatly printed label, giving name, composition, form and locality accompanies each specimen. (See Plate II.)

Substitutions or changes ordered will be charged for at the actual cost of labor involved, and of course extra rarity means increased price. After frequent comparisons it is claimed that our collections are the most economical, because selected with greater care, include a larger number of good crystallizations, are labeled better and present a more attractive appearance than those offered for sale elsewhere. One of the least factors in specimen value is size, yet our publication of average sizes in centimeters and inches is more exact than "good" and "handy." The cataloged collections (except No. 1A) are kept in stock, ready for shipment immediately on receipt of order.

The vast stock from which our collections are selected naturally affords a wide choice of individual specimens for those who prefer to purchase according to their own list. This, however, is not quite so cheap as buying one of the regular cataloged collections, which are economically prepared a number at a time. If you do not find here a collection answering your requirements, send full details, and we will promptly furnish an estimate. If the desired collection is to consist of less than two hundred or three hundred specimens, and is for elementary study, the price list of individual specimens at the end of the catalog will aid in preparing a list.

Advanced Standard Collections.

Systematically Illustrating the Science.

Arranged acording to the generally accepted classification of Dana ("System of Mineralogy," last edition, with Appendix), but can be rearranged as purchasers may desire. The specimens are carefully labeled and numbered to correspond to typewritten list.

No. 1A. COMPLETE TYPE COLLECTION.

Fifteen hundred specimens, museum size, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $3000. Glass cases, $500 extra.

Intended for those desiring a collection, which for study or comparison is fairly complete in the light of present knowledge. Over six hundred distinct species are represented, embracing the most important in Dana's "System." Those omitted are so rare, that they are generally unrepresented in all but the largest museums. Under the commoner species all essential known varieties and types are included, embracing numerous crystal habits, variations of form, structure and color. The multiplication of slight variations or merely local examples is avoided. Otherwise the number of specimens, selected from our extensive stock, might be doubled. The occurrence of the commercial minerals is especially considered worthy of illustration by as many examples as their variations demand. The examples comprising the complete Economic, Crystallographic, Physical and Chemical Series cataloged, all find a place in this general collection. It is only from a stock as comprehensive as ours that such a series of specimens can be selected. New finds permit revision and improvement in the collection from year to year, but the "Complete Type Collection List" which follows, affords an excellent idea of the character of the collection. This or the following collection is preferred by all who appreciate the advantages of a familiarity with the numerous forms in which one mineral is found, and the practical value of the drill in observation which is thus afforded.

No. 3A. Specialist's Complete Type Collection.

Fifteen hundred specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $750. Drawer cabinet, $50. (Pl. V.) Arranged for experts or advanced students, though serving the purpose of institutions desiring a complete collection at a relatively low price. (Same list as for No. 1A.)

No. 5A. UNIVERSITY COLLECTION.

Six hundred specimens, museum size, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $800. Glass cases, $200 extra.

The "University List" (names with + or *) aims to include such minerals as are taken up in most university or college courses. All species chemically important and essential in the illustration of a comprehensive and thorough course are represented. Examples are shown of most of the ores and commercial minerals which the miner or prospector may wish to recognize, because of their actual commercial value. The numerous varieties of well-known minerals which are found with the ores are also worthy of representation, although not in themselves valuable.

The list contains over three hundred and fifty distinct species, and a careful elimination of obscure and less essential names has been observed. As outlined, this collection meets the requirements of a purely scientific course, yet is an invaluable aid in the technical and professional work of laboratory or field. The specimens are in every respect equal to those of No. 1A, approximately half being crystallized, and the remainder, typical crystalline or massive examples of minerals rarely or never occurring in good crystals.

No. 7A. Specialist's Collection.

Six hundred specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $200. Drawer cabinet, $20 extra. Similar to one in Plate VI.

An improvement on a similar collection formerly listed by us at the same price. The present list is that of the "University Collection."

No. 9A. COLLEGE COLLECTION.

Three hundred and sixty specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $480. Glass cases, $120 extra.

The list (which follows 11A) includes only names marked with a cross (+). No effort is spared in the work of abridgment to make this as useful an advanced collection as the limited number of specimens will permit. It includes practically all the minerals, emphasized by heavy type, in Dana's "Text-book of Mineralogy," and contains a much larger percentage of rare species than our old College List. About two-thirds of the specimens are distinct species. As in the larger collections, every care is exercised that the College Collection may be thoroughly illustrative, and serve as a useful adjunct to private study or class work. It makes a splendid display, and includes a large number of very beautiful specimens.

No. 11A. Student's Collection.

Three hundred and sixty specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $120. Drawer cabinet, $15 extra. See Plate VI.

This is arranged according to the revised "College List," and the same care is taken in preparation as with the larger sized collections.

Complete Type Collection, 1500, Entire List

NOS. 1A AND 3A.

University Collection List, 600 Marked + or *

NOS. 5A AND 7A.

College Collection List, 360 Marked +

NOS. 9A AND 11A.

Abbreviations.

cryst'd—crystallized on matrix or in groups.
cryst'ne—crystalline structure.
crystal—detached crystal.
octah.—octahedral.
dodec.—dodecahedral.
prism.—prismatic.
pyram.—pyramidal.
acic.—acicular.
tab.—tabular.
transp.—transparent.
pol.—polished.

General Classification

of the Advanced Collections according to Dana's *"System of Mineralogy," Last Edition with Appendix.*

I. Native Elements.
II. Sulphides, Selenides, Tellurides, Arsenides, Antimonides.
III. Sulpho-salts. — Sulpharsenites, Sulphantimonites, Sulphobismuthites.
IV. Haloids.—Chlorides, Bromides, Iodides, Fluorides.
V. Oxides.
VI. Oxygen-salts.
    1. Carbonates.
    2. Silicates, Titanates.
    3. Niobates, Tantalates.
    4. Phosphates, Arsenates, Vanadates, Antimonates, Nitrates.
    5. Borates. Uranates.
    6. Sulphates, Chromates, Tellurates.
    7. Tungstates, Molybdates.
VII. Salts of Organic Acids: Oxalates, Mellates, etc.
VIII. Hydrocarbon Compounds.

New Species. From the Supplement and Appendix.

I. Native Elements.

1. Non-Metals.

1+ DIAMOND, crystal, octahedral
2 " " dodecahedral
3* " Bort
4 " Carbonado
5+ GRAPHITE, foliated
6 " radiated
7 GRAPHITE, scales, hexagonal
8 " earthy
9+ SULPHUR, cryst'd
10 " " acute pyramidal
11* " crystal, obtuse "
12 " cryst'd, tabular
13+ " " sphenoidal
14 " massive
15 " encrusting

II. Semi-Metals.

16 TELLURIUM, cryst'd
17* " massive
18 ARSENIC, cryst'd
19 " granular
20+ " reniform
21* ALLEMONTITE, cryst'ne
22+ ANTIMONY, granular
23 " radiated
24 BISMUTH, cryst'd
25+ " foliated

III. Metals.

26 GOLD, cryst'd, octah.
27 " " hollow
28* " crystals, elongated
29 " cryst'd, filiform
30 " " spongiform
31 " disseminated masses
32 " " plates
33+ " " grains
34+ " " microscopically
35 " nugget
36 " grains
37+ " dust
38* " electrum
39* SILVER, cryst'd
40 " " arborescent
41+ " " filiform
42+ " disseminated grains
43 " " masses
44* " disseminated plates
45 " coating
46 COPPER, cryst'd, dodec.
47 " " tetrahex.
48 " " twin
49+ " " arborescent
50* " " distorted
51 " " filiform
52 " plates
53+ " massive
54+ " disseminated
55 " sand
56+ MERCURY
57* AMALGAM
58+ LEAD
59 PLATINUM, nugget
60+ " grains
61+ IRIDOSMINE
62* IRON, terrestrial
63 " meteoric, diamondiferous
64+ " " cryst'ne, etched
65 " " Siderolite
66* " " stone

II. Sulphides, Selenides, Tellurides, Arsenides, Antimonides.

I. Sulphides, Selenides, Tellurides, of the Semi-Metals.

67 REALGAR, cryst'd
68+ " massive
69* ORPIMENT, cryst'd
70+ " foliated
71 " reniform
72* STIBNITE, crystal, prism.
73 " cryst'd, acicular
74 " crystal, bent
75+ " columnar
76 " granular
77 BISMUTHINITE, cryst'd, acicular
78+ " bladed
79+ TETRADYMITE, cryst'd
80 " massive
81 MOLYBDENITE, cryst'd, prism.
82+ " " tab.
83* " cleavage, hex.
84 " disseminated scales
85 " granular

II. Sulphides, Selenides, Tellurides, Arsenides, Antimonides, of the Metals.

86+ DYSCRASITE, cryst'ne
87 DOMEYKITE, Condurrite
88* " Stibiodomeykite
89* WHITNEYITE
90 CHILENITE, cryst'ne
91 ARGENTITE, crystal, cubic
92 " cryst'd, cubo-octah.
93* " crystal, distorted
94 " massive
95 " disseminated
96 HESSITE, cryst'd
97* " massive
98 PETZITE
99+ GALENA, cryst'd, cubic
100* " " octah.

101 GALENA, cryst'd, cubo-octah.
102 " " twin
103 " " reticulated
104 " " hollow
105 " crystal, elongated
106+ " cleavage
107 " fibrous
108+ " argentif., granular
109 ALTAITE, cryst'ne
110 CLAUSTHALITE, cryst'ne
111 NAUMANNITE
112 BERZELIANITE
113 LEHRBACHITE
114 ZORGITE
115 CROOKESITE
116* CHALCOCITE, Redruthite, cr'd
117 " " crystal, twin
118 " massive, granular
119+ " compact
120 STROMEYERITE
121* STERNBERGITE
122 ACANTHITE, crystal
123+ SPHALERITE, cryst'd, black
124+ " " brown
125+ " " ruby blende
126 " " yellow
127 " crystal, distorted
128 " " repeated
129 " " twin
130 " " iridescent
131 " cleavage, dodec.
132 " " transp.
133 " coarse granular
134+ " fine " gray
135+ " fibrous
136 " Schalenblende
137 " Marmatite, cr'd
138* " cadmiferous
139 METACINNABARITE, cryst'd
140* " massive
141 TIEMANNITE, cryst'd
142* " massive
143 ALABANDITE, cryst'd
144* " massive
145* PENTLANDITE
146* CINNABAR, cryst'd, rhombic
147 " " acicular
148 " " drusy
149+ " massive
150 " earthy
151 " hepatic
152* COVELLITE
153 GREENOCKITE, crystal
154+ " coating
155* WURTZITE, cryst'd
156 " massive
157 MILLERITE, cryst'd, capillary
158 " " acicular
159+ " fibrous coating
160 NICCOLITE, cryst'd
161+ " massive
162 BREITHAUPTITE, cryst'd
163 TROILITE
164 PYRRHOTITE, cryst'd, thin tab.
165 " crystal, thick "
166+ " massive, nickeliferous
167 BORNITE, cryst'd
168+ " granular, argentif.
169 " compact, iridescent
170+ LINNÆITE, cryst'd
171+ CHALCOPYRITE, " tetrahedral
172 " " parallel
173 " " contact twin
174 " " penet'n "
175* " " hollow
176+ " compact
177 " granular
178 " reniform
179+ STANNITE, yellowish
180 " bluish
181+ PYRITE, cryst'd, cubic
182* " " octah.
183 " " cubo-octah.
184+ " crystal, pyritohedral
185 " " modified
186* " " distorted
187 " " twin
188 " cryst'd, disk
189* " " ball
190 " " stalactitic
191 " granular
192+ " compact
193+ " alt. to Limonite, cryst.
194* HAUERITE, crystal, octah.
195 " " cubo-octah.
196 SMALTITE, cryst'd
197+ " massive
198 CHLOANTHITE, cryst'd
199+ " massive
200 COBALTITE, crystals, red-gray
201+ " cryst'd, tin-white
202 GERSDORFFITE, "

203 CORYNITE
204* ULLMANNITE, cryst'd
205 " massive
206* SPERRYLITE, crystals, micro.
207 SKUTTERUDITE, cryst'd
208+ MARCASITE, cr'd, "cockscomb"
209 " " spear
210 " stalactitic
211* " globular, radiated
212* LOLLINGITE, cryst'd
213 " Leucopyrite
214 ARSENOPYRITE, cryst'd
215+ " " twin
216+ " massive
217 " Danaite
218 SAFFLORITE
219 RAMMELSBERGITE
220* GLAUCODOT, crystal
221 ALLOCLASITE
222+ SYLVANITE, cryst'd
223 " " graphic
224* CALAVERITE, cryst'd
225 NAGYAGITE, cryst'ne
226* KERMESITE, cryst'd

III. Sulpho-Salts.

I. Sulpharsenites, Sulphantimonites, etc.

227 LIVINGSTONITE
228* ZINKENITE, cryst'd
229 EMPLECTITE, "
230 GALENOBISMUTHITE, cryst'ne
231 BERTHIERITE, cryst'd
232 MIARGYRITE, "
233 PLAGIONITE, "
234 BINNITE, "
235 DUFRENOYSITE, "
236 COSALITE
237 JAMESONITE, cryst'd, capillary
238 " fibrous
239+ " granular
240 DIAPHORITE, cryst'd
241* FREIESLEBENITE, "
242+ BOURNONITE, "
243 " crystal, twin
244+ BOULANGERITE
245 GUITERMANITE
246* PYRARGYRITE, cryst'd
247 " " twin
248 " compact
249+ PYRARGYRITE, coating
250 PROUSTITE, cryst'd
251 " " twin
252+ " massive
253+ TETRAHEDRITE, cr'd, tetrahed.
254 " " twin
255 " massive
256+ " argentiferous
257 " mercurial
258 " altered to Chalcopyrite
259* TENNANTITE, cryst'd
260* MENEGHINITE, crystals
261+ STEPHANITE, cryst'd, prism.
262 " " tab.
263 " massive
264 POLYBASITE, crystal, prism.
265* " cryst'd, tab.
266 " massive

II. Sulpharsenates, Sulphantimonates, etc.

267 ENARGITE, cryst'd
268+ " massive
269 FAMATINITE
270 XANTHOCONITE, cryst'd
271 ARGYRODITE, "

IV. Haloids.

I. Anhydrous Chlorides, Bromides, Iodides, Fluorides.

272* CALOMEL, cryst'd
273 NANTOKITE
274 HALITE, crystal, cubic
275 " crystals, octah.
276 " " cubo-octah.
277* " cryst'd, hollow cubic
278+ " cleavage
279* " granular
280 " banded
281 SYLVITE, cryst'd
282+ " massive
283* SAL-AMMONIAC, cryst'd
284 CERARGYRITE, "
285 " compact
286+ " coating
287+ EMBOLITE, cryst'd, cubic
288 " " dodec.
289 " cryst'ne, spongy
290* " massive
291 BROMYRITE, cryst'd

292 IODYRITE, cryst'd
293* " massive
294+ FLUORITE, cryst'd, cubic blue
295+ " " " yellow
296 " " " green
297 " crystal, gray, cube
298 " cr'd, modified cube
299* " " octah.
300 " crystal, pseudo-octah.
301 " cryst'd, cubo-octah.
302 " " tetrahexahedron
303 " " dodec.
304 " crystal, twin, lined
305+ " pink, octah. cleavage
306+ " green, tetrah. "
307+ " granular, white
308 " altered to Quartz
309 SELLAITE, cryst'd
310 LAWRENCITE
311 COTUNNITE
312 TYSONITE
313+ CRYOLITE, cryst'd, yellowish
314 " massive, white

II. Oxychlorides, Oxyfluorides.

315 MATLOCKITE, cryst'd
316 MENDIPITE, "
317 SCHWARTZEMBERGITE, cryst'd
318 LAURIONITE, cryst'd
319 PERCYLITE, "
320+ ATACAMITE, " acicular
321 " cryst'ne
322 " massive
323 NOCERITE
324 FLUOCERITE
325 BISCHOFITE
326+ CARNALLITE
327* TACHHYDRITE
328 PACHNOLITE, cryst'd
329 THOMSENOLITE, "
330 GEARKSUTITE
331 RALSTONITE, "
332 YTTROCERITE

V. Oxides.

I. Oxides of Silicon.

QUARTZ.

A. Phenocrystalline Varieties.

333+ QUARTZ, Rock Crystal, prism.
334* QUARTZ, Rock Crystal, rhombic
335+ " " " doubly term.
336 " " " modified
337 " " " twin
338 " " " water-worn
339 " " " capped
340+ " " " drusy, geode
341 " " " radiated
342 " asteriated
343+ " Amethyst
344+ " Rose
345 " yellow, Citrine
346+ " Smoky, light
347+ " Milky
348 " Sapphire Quartz
349+ " cont. Tourmaline, pol. sec.
350 " Cat's-Eye, pol.
351 " Aventurine, "
352* " Ferruginous
353 " Chloritic, "phantom"
354+ " cont'g liquid, cavernous

B. Cryptocrystalline Varieties.

355+ QUARTZ, Chalcedony
356 " " cont'g liquid
357 " Carnelian, pol.
358* " Chrysoprase, "
359 " Prase, "
360+ " Heliotrope, Bloodstone
361+ " Agate, banded, pol.
362 " Eye-Agate "
363+ " Moss " green "
364+ " Dendritic Agate, gray
365* " Onyx, pol.
366 " Sardonyx, pol.
367+ " Flint
368 " Hornstone
369 " Basanite (Touchstone)
370+ " Jasper, red
371 " " green
372 " " riband
373+ " " Jasp. Wood, pol.

C. Other Varieties.

374 QUARTZ, granular
375 " Sandstone
376 " Conglomerate
377+ " Itacolumyte, flexible
378 " Buhrstone
379 " pseudomorphous, tab.
380 " " Silic. Wood

381* TRIDYMITE, cryst'd, tab.
382 " " twin
383 Granuline
384 Melanophlogite, cryst'd
385 OPAL, precious, greenish
386+ " " bluish
387 " " harlequin
388+ " " layer
389+ " Fire
390 " Girasol
391* " Common, milky
392 " " resin
393+ " " green
394 " " red
395 " Hydrophane
396 " Cacholong
397 " Opal-agate
398 " Menilite
399 " Jasp-opal
400+ " Wood-opal
401+ " Hyalite
402 " Fiorite
403* " Geyserite
404 " Float-stone
405+ " Tripolite

II. Oxides of the Semi-Metals, etc.

406 ARSENOLITE, cryst'd
407* SENARMONTITE, cryst'd
408 " crystals
409 VALENTINITE, cryst'd
410* " stellated
411 BISMITE
412 TELLURITE
413* MOLYBDITE
414* CERVANTITE
415 STIBICONITE

III. Oxides of the Metals.

A. Anhydrous Oxides.

416* CUPRITE, cryst'd, cubic
417+ " " octah.
418 " " dodec.
419 " " modified
420+ " Chalcotrichite, capillary
421+ " massive
422 " crystals alt. to Malach.
423 PERICLASE, cryst'd
424 MANGANOSITE
425 ZINCITE, foliated
426+ ZINCITE, granular
427* MASSICOT
428 TENORITE, cryst'd
429* " massive, Melaconite
430+ CORUNDUM, Sapphire, crystal
431 " " " star
432 " Ruby, dark red, "
433* " " light " cleavage
434 " gray, crystal
435+ " " cleavage
436 " crystal, twin
437+ " Emery, granular
438+ " small crystals, altered
439 HEMATITE, cryst'd, thick, tab.
440+ " " thin "
441 " " rhombic
442+ " " modified
443 " " twin, Eisenrose
444 " crystal, modified
445 " " cube-like rhomb
446 " lamellar
447* " micaceous
448+ " columnar, Pencil Ore
449+ " granular
450 " Kidney Ore
451 " Jasp. Clay-Iron-Stone
452+ " Fossil, Red Ochre
453+ " Martite, cryst'd
454 ILMENITE, crystal
455+ " Menaccanite, lamellar
456* " " compact
457 " Washingtonite
458 " Paracolumbite
459+ SPINEL, cryst'd, octah., gray
460 " " " black
461 " crystal, modified
462* " crystals, twins
463* " Spinel-Ruby, crystals
464 " Ceylonite, pebbles
465 HERCYNITE
466 GAHNITE, Automalite, cryst'd
467+ " Dysluite, "
468* MAGNETITE, cryst's, octah. mod.
469+ " cryst'd
470 " " dodec., striat'd
471 " octah., parting
472* " granular
473 " Sand
474+ " Lodestone, compact
475 " dendritic
476 " pseudo. Dimagnetite

477 MAGNESIOFERRITE
478+ FRANKLINITE, cryst'd, octah.
479 " " dodec.
480* " granular
481 " compact
482 JACOBSITE, cryst'd
483 CHROMITE, crystals
484 " compact
485+ " granular
486+ CHRYSOBERYL, cryst'd
487 " precious
488* " Alexandrite, crystal
489 " Cat's-Eye, pol.
490 HAUSMANNITE, cryst'd
491* " massive
492 MINIUM
493 PSEUDOBROOKITE, cryst'd
494+ BRAUNITE, cryst'd
495 " massive

IV. Dioxides.

496 CASSITERITE, cryst'd, acicular
497+ " " contact twin
498 " " pentr. "
499 " " repeat'd "
500* " massive, brown
501 " " yellow
502+ " disseminated
503 " Wood Tin
504+ " Stream Tin, fine
505 " " coarse
506 POLIANITE
507+ RUTILE, red crystals
508 " " cr'd, pseudo-rhom.
509+ " " crystal, twin
510 " " acicular crystals
511 " " reticulated "
512* " " capillary
513 " brown, cryst'd
514 " Nigrine, crystal, twin
515+ " " cryst'ne
516* " paramorph—Brookite
517 OCTAHEDRITE, bl'k, cryst's, tab.
518+ " " cr'd, pyrm.
519 " yellow "
520 BROOKITE, cryst'd, tab.
521 " Arkansite, crystal
522+ " " cryst'd
523* PYROLUSITE, cryst'd, prism.
524 " " tab.
525+ PYROLUSITE, cryst'ne
526 " columnar
527 " granular

B. Hydrous Oxides.

528 TURGITE, fibrous
529* " reniform
530+ DIASPORE, cryst'd
531 " foliated, massive
532 GOTHITE, cryst'd, tabular
533+ " " acicular
534 " " radiated
535* " columnar
536 " velvety
537 " Onegite
538+ " fibrous, reniform
539 MANGANITE, cryst'd
540+ " columnar
541* LIMONITE, compact
542 " stalactitic
543+ " botryoidal, iridescent
544 " ocherous, brown
545+ " " yellow
546 " Bog Ore
547 " Clay-Iron-Stone
548 " pisolitic
549 XANTHOSIDERITE
550 BAUXITE, red, pisolitic
551+ " yellowish
552 " grayish, earthy
553+ BRUCITE, cryst'd
554 " fibrous, Nemalite
555 PYROCHROITE, foliated
556* GIBBSITE
557 HYDROTALCITE
558 PYROAURITE, cryst'd
559* CHALCOPHANITE, "
560+ PSILOMELANE, massive
561 " reniform
562 " stalactitic
563 LITHIOPHORITE
564* WAD (A) Bog Manganese
565* " (B) Asbolite, cobaltif.
566 " (C) Lampadite, cupre's

VI. Oxygen-Salts.

I. Carbonates.

A. Anhydrous Carbonates.

CALCITE.

Crystallized Varieties.

567 CALCITE, rhombic, obtuse

568 CALCITE, scalenohedral, white
569 " " "phantom"
570+ " modif. " yellow
571+ " hexagonal
572+ " " Papierspath
573 " Nail-head Spar
574* " modified
575* " twin, scalenohedral
576 " modified twin
577 " cleavage " asteriated
578+ " Iceland Spar
579 " cleavage, red
580 " " blue
581+ " siliceous, acute rhomb.
582 " " hexag. pyram.

Fibrous and Lamellar Varieties.

583 CALCITE, Satin Spar
584 " Argentine
585+ " Marble, white, pol.
586* " " Siena, yellow, pol.
587 " " black, pol.
588 " " Egyptian, pol.
589* " " Shell-marble, pol.
590 " " Ruin Marble, "
591 " " Breccia " "
592 " " Puddingstone, "
593+ " Lithographic stone
594+ " Hydraulic Limestone
595+ " Chalk
596 " Oölite
597* " Pisolite
598+ " Stalactite
599 " Stalagmite
600+ " Mexican Onyx, pol.
601 " Onyx, clouded, "
602* " Travertine
603+ " Calc Tufa
604 " Rock-milk

Varieties Based Upon Composition.

605 CALCITE, Strontianocalcite
606* " Ferrocalcite
607 " Manganocalcite

Alterations.

608 CALCITE, altered to Calamine
609* " " " Quartz
610 " Thinolite
611+ DOLOMITE, cryst'd, Pearl Spar
612 " "curved " "
613+ " granular massive
614 " compact "
615 DOLOMITE, ferriferous
616 " alt. to Calamine
617* ANKERITE, cryst'd
618 " granular
619 MAGNESITE, "
620+ " compact
621 " ferrif., Breunnerite
622 MESITITE, cryst'd
623+ SIDERITE, " rhomb.
624 " " " acute
625 " " " curved
626* " " modified
627 " crystal, twin
628 " Sphærosiderite
629+ " cleavage
630 " granular
631 RHODOCHROSITE, cryst'd
632 " drusy
633+ " cleavable
634* SMITHSONITE, cryst'd
635+ " mammillary
636 " massive
637 " cupriferous
638 " cadmiferous
639 SPHÆROCOBALTITE
640* ARAGONITE, cry'l, prism, yellow
641* " cryst'd, acicular, rad.
642 " " " "spire"
643 " " twins, white
644+ " crystals " brown
645 " fibrous
646+ " coralloidal, Flos-ferri
647 " Tarnowitzite
648 " Mossottite
649 " crystal, altered
650 BROMLITE, cryst'd, pseudo-hex.
651+ WITHERITE, " " "
652 " granular
653 STRONTIANITE, cryst'd
654+ " columnar
655 CERUSSITE, cryst'd, tabular
656 " " prismatic
657 " " pyramidal
658+ " " twin
659+ " " aggregate
660 " " reticulated
661+ " granular, brown
662* " compact, gray
663+ BARYTOCALCITE, cryst'd, prism.
664 PARISITE, cryst'd
665 BASTNASITE, crystal

666+ PHOSGENITE, cryst'd, prism
667 " " modified
668 " cryst'ne

B. Acid, Basic and Hydrous Carbonates.

669 MALACHITE, cryst'd, acicular
670+ " " capillary
671+ " massive
672 " incrusting
673 " botryoidal
674 " velvety
675* " banded, pol.
676 AZURITE, cryst'd, Chessylite
677* " ball of crystals
678 " cryst'd, tab.
679+ " " modified
680 " " drusy
681+ " massive
682* " alt. to Malachite
683 " " " Copper
684* AURICHALCITE, cryst'd
685* HYDROZINCITE
686 HYDROCERUSSITE, cryst'd
687 DAWSONITE
688+ GAY-LUSSITE, cryst'd
689 LANTHANITE
690+ TRONA
691 HYDROMAGNESITE
692* ZARATITE
693 BISMUTITE
694 VOGLITE
695 Randite

2. Silicates.
A. Anhydrous Silicates.
I. Disilicates, Polysilicates.

696 PETALITE, Castorite
697+ " massive
698 MILARITE, cryst'd
699 EUDIDYMITE, crystal
700* ORTHOCLASE, Adularia, cryst'd
701 " Valencianite, "
702* " Sanidine, "
703 " white, crystal
704 " yellow, cryst'd
705+ " reddish, "
706+ " cleavage
707+ " Carlsbad twin crystal
708* " Baveno " "
709 " Manebach " cryst'd
710 ORTHOCLASE, compact red
711 " Loxoclase
712 " Necronite
713 " alt. to Cassiterite
714 PERTHITE, cleavage
715 HYALOPHANE, cryst'd
716 MICROCLINE, grayish, chatoy'nt
717+ " Amazonstone, crystal
718 " Chesterlite, cryst'd
719 ANORTHOCLASE
720* ALBITE, cryst'd
721 " massive
722 " Peristerite
723 " Aventurine
724+ " Moonstone
725+ " Pericline, cryst'd
726+ " Cleavelandite, lamel.
727 OLIGOCLASE, cryst'd
728 " transp., massive
729+ " Sunstone, cleav.
730* ANDESINE, cryst'ne
731+ LABRADORITE, blue, cleav. pol.
732 " compact
733* ANORTHITE, crystal, gray
734+ " cryst'd, white
735 " massive

II. Metasilicates.

736+ LEUCITE, crystal
737 " cryst'd
738 POLLUCITE
739 ENSTATITE, grayish, fibrous
740+ " Bronzite, cryst'ne
741 " altered to a steatite
742+ HYPERSTHENE, cleavage
743+ PYROXENE, Diopside, cryst'd
744* " Malacolite, crystal
745 " Mussite
746 " Hedenbergite, cryst'd
747 " Salite, cleavage
748* " Violan
749+ " Coccolite
750 " Diallage
751 " Omphacite
752* " Schefferite, cryst'd
753 " Jeffersonite, "
754 " Augite, Leucaugite
755 " " Fassaite
756+ " " green, cryst'd
757 " " black, "
758+ " " " crystals

759 PYROXENE, Augite, bl'k, tw'n cr's
760 ACMITE, cryst'd
761+ " Aegirite, cryst'd
762 SPODUMENE, cryst'd
763+ " cleavage
764 " Hiddenite, crystal
765+ JADEITE, dark green
766 " greenish gray
767+ WOLLASTONITE, grayish, cryst'd
768 " pink, manganif. "
769 PECTOLITE, cryst'd
770+ " mammillary, radiated
771 " Manganpectolite
772 LAVENITE
773 WOHLERITE, cryst'd
774* RHODONITE, Paisbergite, cryst'd
775+ " granular
776 " compact
777 " Bustamite
778+ " Fowlerite
779 BABINGTONITE, cryst'd
780+ ANTHOPHYLLITE, radiated
781 " Gedrite
782+ AMPHIBOLE, Tremolite, cryst'd
783 " " columnar
784 " " fibrous
785* " " Hexagonite
786* " Actinolite, cryst'd
787+ " " columnar
788 " " radiated
789 " Nephrite
790+ " Asbestus, white
791 " " gray
792* " Mountain leather
793 " " wood
794 " Byssolite
795 " Uralite
796 " Richterite, cryst'd
797 " Breislakite, "
798* " Edenite, "
799 " Pargasite, "
800 " Hornblende, "
801+ " " crystals
802+ " " cleavage
803 " " granular
804 " " green, cryst.
805+ GLAUCOPHANE, cryst'ne
806* RIEBECKITE, cryst'd
807+ CROCIDOLITE, fibrous
808 " altered to Quartz, pol.
809+ ARFVEDSONITE, crystal
810 ÆNIGMATITE
811+ BERYL, Emerald, cryst'd
812+ " ordinary, crystal
813 " " massive
814 " colorless, cryst'd
815* " Aquamarine
816 " yellow, crystal, transp.
817 " " massive, opaque
818* EUDIALYTE, cryst'd
819 " Eucolite, cryst'd
820 CATAPLEIITE, crystal
821 MELANOCERITE
822 CARYOCERITE, cryst'd
823 TRITOMITE
824 LEUCOPHANITE, cryst'd
825 MELIPHANITE, "
826 IOLITE, "
827+ " granular
828 GANOMALITE, cryst'ne

III. Orthosilicates.

829 NEPHELITE, gray, cryst'd
830+ " glassy, white, cryst'd
831 " Elæolite, "
832+ " " massive
833 " altered, Gieseckite
834 " " Liebenerite
835+ CANCRINITE, yellow
836 " blue
837 MICROSOMMITE, cryst'd
838 SODALITE, cryst'd
839+ " massive
840 HAUYNITE, cryst'd
841 " massive, blue
842+ " granular, green
843 NOSELITE, cryst'd
844 LAZURITE, "
845+ " massive
846* HELVITE, cryst'd
847 DANALITE, "
848 EULYTITE, "
849 ZUNYITE, "
850+ GARNET, Grossularite, cr'd, white
851 " " " green
852 " " " yellow
853 " " cr'd, transl., brown
854+ " " " opaque
855 " " " rose-red
856 " Pyrope, pebbles, transl.
857+ " Almandite, red, cr'l, dodec.
858* " " " cr'd, mod.

859 GARNET, Almandite, br'n, cr's
860+ " Spessartite, transp.
861 " " cryst'd
862* " Andradite, Topazolite, cr'd
863 " " Demantoid, "
864 " " Colophonite
865 " " Melanite, "
866+ " " Polyadelphite, "
867 " " Yttriferous
868 " Uvarovite, cryst'd
869 " altered to Chlorite
870 SCHORLOMITE
871* MONTICELLITE, cryst'd
872 FORSTERITE
873* " Boltonite
874 CHRYSOLITE, cryst'd
875* " precious
876 " meteoric
877+ " Olivine, granular
878 " Hyalosiderite
879 FAYALITE
880 KNEBELITE
881 TEPHROITE
882 ROEPPERITE
883* WILLEMITE, Troostite, cryst'd
884 " transparent, "
885+ " green, massive
886 " reddish, "
887+ PHENACITE, cryst'd
888+ DIOPTASE, "
889 FRIEDELITE
890 PYROSMALITE, "
891+ MEIONITE, "
892+ WERNERITE, "
893 " Nuttalite, cryst'd
894+ " massive, pink
895 " " yellow
896 " Glaucolite
897 MIZZONITE, Dipyre, cryst'd
898 SARCOLITE, cryst'd
899+ MELILITE, "
900 " Humboldtilite, cryst'd
901 GEHLENITE, cryst'd
902 Cacoclasite, "
903* VESUVIANITE, crystal, prism.
904 " cryst'd "
905 " " pyr. & "
906 " " modified
907+ " columnar
908 " Cyprine
909+ ZIRCON, crystals, prism & pyram.
910 ZIRCON, cryst'd, pyramidal
911 " " modified
912* " " twin
913+ " Hyacinth, crystals, mod.
914 " Jargon
915 " alt., Malacon, cryst'd
916 " " Cyrtolite, "
917* THORITE, crystal
918 " massive
919 " Orangite
920+ DANBURITE, cryst'd
921 " crystals, transp.
922 TOPAZ, cryst'd
923+ " crystals, colorless
924* " " yellow
925 " " blue
926 " transparent cleavage
927 " pebbles
928* " massive, opaque, gray
929 " Pycnite
930+ ANDALUSITE, cryst'd
931* " Chiastolite, cryst'd
932+ SILLIMANITE, cryst'd
933 " Fibrolite, columnar
934* CYANITE, cryst'd, blue
935+ " bladed, curved
936 " green
937 " white
938+ DATOLITE, " cryst'd
939 " green, "
940 " compact
941 HOMILITE, cryst'd
942 EUCLASE, crystal, transparent
943 GADOLINITE, cryst'd
944* " massive
945 YTTRIALITE
946 ZOISITE, cryst'd, brown
947+ " columnar, gray
948* " Thulite, pink
949+ EPIDOTE, cr'd, pale green
950 " cr'l, dark " transp.
951+ " massive, "
952 " cryst'd, gray
953* PIEDMONTITE, cryst'd
954 " cryst'ne
955 ALLANITE, cryst'd
956+ " massive
957 AXINITE, brown, cryst'd
958+ " " " modif.
959 " yellow, " "
960* " " compact

961 PREHNITE, distinctly cryst'd
962 " cryst'd, rounded
963+ " drusy, mammillary

IV. Subsilicates.

964 HUMITE, cryst'd
965+ CHONDRODITE, cryst'd red
966 " granular, yellow
967 " altered, gray
968 CLINOHUMITE, cryst'd
969* ILVAITE, "
970 ARDENNITE
971 LANGBANITE, "
972 KENTROLITE, "
973* MELANOTEKITE, "
974 BERTRANDITE, "
975 CALAMINE, " tabular
976 " " curved
977+ " " drusy
978 CARPHOLITE, cryst'd
979* CERITE
980 TOURMALINE, black, cr'd, acic.
981 " black, crystal, prism.
982 " " cryst'd, modif.
983+ " " radiated
984+ " Rubellite, cryst'd
985 " " crystal, transp.
986 " Indicolite, cryst'd
987* " brown, cr'd, modif.
988 " " " flat
989 " Achroite, crystals
990+ " green, transp. "
991 " multi-colored, cr'l
992* " columnar, black
993 DUMORTIERITE, cryst'ne
994* STAUROLITE, cryst'd, prism.
995+ " crystals, twin
996 SAPPHIRINE

B. Hydrous Silicates.

I. Zeolite Division.

997 INESITE, fibrous
998 GANOPHYLLITE
999 OKENITE
1000* APOPHYLLITE, cryst'd, pink
1001 " " pyram.
1002+ " " prism.
1003 " " tabular
1004 " " cube-like
1005 " foliated
1006 PTILOLITE, cryst'ne
1007+ HEULANDITE, white, cryst'd
1008 " red "
1009 BREWSTERITE, cryst'd
1010 EPISTILBITE, "
1011 PHILLIPSITE, cr'd, crucif. twin
1012+ " " comp'nd "
1013* " " drusy, glob.
1014* HARMOTOME, cryst'd
1015* STILBITE, " tabular
1016+ " " aggreg. brown
1017 " crystal, "sheaf"
1018 " radiated, white
1019 " foliated, red
1020 GISMONDITE, cryst'd
1021 LAUMONTITE, " white
1022* " " red
1023+ CHABAZITE, " white
1024* " cr'd, Acadialite
1025 " " brown
1026 " Haydenite, cryst'd
1027 " Phacolite, flat twin
1028+ " " lenticular "
1029 " " composite "
1030 " Herschellite, globular
1031+ GMELINITE, rhombic twin
1032 " hexagonal twin
1033+ ANALCITE, cryst'd, white
1034 " " transp.
1035 " crystal, reddish
1036 FAUJASITE, cryst'd
1037 EDINGTONITE, "
1038+ NATROLITE, " prismatic
1039* " " capillary
1040 " " radiated
1041 " massive, "
1042+ SCOLECITE, cryst'd
1043 " radiated
1044 MESOLITE, cryst'd
1045* " " globular
1046 THOMSONITE, cryst'd
1047+ " globular, white
1048 " pebbles, red

Appendix to Zeolites.

1049 Chlorastrolite
1050 Zonochlorite

II. Mica Division.

1051+ MUSCOVITE, crystal, hex. form
1052* " " rhombic "

1053 MUSCOVITE, crystal, green
1054+ " Damourite
1055 " Margarodite
1056 " Gilbertite
1057 " Ivigtite
1058 " Sericite
1059 " Oncosine
1060* " Fuchsite
1061 " Oellacherite
1062 Pinite
1063 Agalmatolite
1064 PARAGONITE
1065 Euphyllite
1066 LEPIDOLITE, cryst'd
1067+ " coarse scaly-gran.
1068 " fine " "
1069 Cookeite, cryst'ne
1070* ZINNWALDITE, cryst'd, gray
1071 " Cryophyllite, cryst'd
1072+ BIOTITE, cryst'd, black
1073* BIOTITE, crystal, silvery
1074 " cryst'd, green
1075 " Barytbiotite, cryst'd
1076 " Siderophyllite, "
1077 " Manganophyllite "
1078 Rubellan, cryst'd
1079 PHLOGOPITE, crystal
1080+ " cleavage, asteriated
1081 LEPIDOMELANE, cryst'ne
1082 ROSCOELITE, "
1083+ MARGARITE, cryst'd, reddish
1084 " schistose, greenish
1085+ SEYBERTITE, Clintonite, cr'd
1086 " Brandisite, "
1087 XANTHOPHYLLITE, cryst'd
1088 CHLORITOID, Sismondine
1089+ " Masonite
1090 OTTRELITE, cryst'ne
1091 CLINOCHLORE, cryst'd
1092+ " " cleavage
1093 " Leuchtenbergite
1094+ PENNINITE, cryst'd
1095 " Kammererite
1096 " Rhodochrome
1097 PROCHLORITE, cryst'd
1098+ " scaly-granular
1099* CORUNDOPHILITE, cryst'd
1100 Klementite
1101* CRONSTEDTITE, cryst'd
1102 THURINGITE
1103 STILPNOMELANE, Chalcodite
1104 DIABANTITE
1105 DELESSITE
1106* JEFFERISITE, cleavage
1107 Vermiculite
1108 Roseite, cryst'd

III. Serpentine and Talc Division.

1109 SERPENTINE, cryst'd, pseudo.
1110 " massive, precious
1111+ " " common
1112 " " resinous
1113 " " Bowenite
1114+ " Williamsite, lamellar
1115 " thin fol., Marmolite
1116+ " fibrous, Chrysotile
1117 " " Picrolite
1118+ " Marble, polished
1119* DEWEYLITE, yellowish
1120 " greenish
1121+ GENTHITE
1122+ Garnierite
1123+ TALC, foliated, green
1124 " coarse granular, gray
1125* " fine " white
1126 " indurated
1127 " pseudomorphous
1128+ SEPIOLITE
1129* SAPONITE
1130 CELADONITE
1131 GLAUCONITE, earthy
1132* " sand

IV. Kaolin Division.

1133 KAOLINITE, clayey, yellowish
1134+ " compact, white
1135+ HALLOYSITE
1136 CIMOLITE
1137 MONTMORILLONITE
1138+ PYROPHYLLITE, rad. lamellar
1139 " compact
1140+ ALLOPHANE
1141 SCHROTTERITE

V. Concluding Division.

1142 CENOSITE, cryst'd
1143* THAUMASITE, cryst'ne
1144* URANOPHANE
1145+ CHRYSOCOLLA, blue
1146 " botryoidal, green
1147* CHLOROPAL
1148 HISINGERITE

1149 BEMENTITE
1150 CARYOPILITE
1151 NEOTOCITE

Appendix to Hydrous Silicates.

1152 Aquacreptite
1153 Picrosmine

Titano-Silicates.

1154+ TITANITE, crystal, black
1155 " " twin, yellow
1156* " cryst'd, twin, green
1157 " Lederite, cryst'd
1158 " Greenovite, "
1159 " cleavage, brown
1160 KEILHAUITE, cryst'd
1161 TSCHEFFKINITE
1162* ASTROPHYLLITE, cryst'd
1163 JOHNSTRUPITE, "
1164 MOSANDRITE, "
1165* PEROVSKITE, "
1166 DYSANALYTE, cryst'd
1167* " crystals
1168 Hydrotitanite, "

3. Niobates, Tantalates.

1169* PYROCHLORE, cryst'd
1170 KOPPITE, "
1171* MICROLITE, crystals
1172+ FERGUSONITE, cryst'd
1173 SIPYLITE
1174+ COLUMBITE, cryst'd, striated
1175 " crystals, bright
1176 " massive
1177 TANTALITE, "
1178+ " grains
1179 SKOGBOLITE
1180* YTTROTANTALITE
1181+ SAMARSKITE, cryst'd
1182 ANNERODITE, "
1183 HIELMITE
1184 ÆSCHYNITE
1185 POLYMIGNITE
1186 EUXENITE
1187 POLYCRASE

4. Phosphates, etc.

A. Anhydrous Phosphates, Arsenates, Vanadates, Antimonates.

1188* XENOTIME, cryst'd
1189* MONAZITE, crystal
1190 MONAZITE, Turnerite, cryst'd
1191 " cryst'd
1192+ " sand
1193 BERZELIITE, cryst'd
1194 CARYINITE
1195* PUCHERITE, "
1196+ TRIPHYLITE
1197+ LITHIOPHILITE
1198* BERYLLONITE, crystal
1199 HERDERITE, "
1200* APATITE, cryst'd, white
1201 " crystal, green, transp.
1202+ " cryst'd "
1203 " " blue
1204+ " crystal, brown
1205* " massive, grayish
1206 " Asparagus stone
1207 " Francolite, cryst'd
1208 " Staffelite
1209+ Phosphatic Nodules
1210 Guano
1211+ PYROMORPHITE, cr'd, green
1212 " cr'd, yellow, rounded
1213* " " brown
1214 " " " moss-like
1215 " alt. to Galena
1216 MIMETITE, cryst'd, yellow
1217 " massive, white
1218+ " Campylite, cr'd, glob.
1219+ Endlichite, cr'd, yellow, "
1220 " " red, prism.
1221* " crystal, multi-color.
1222 " massive
1223+ VANADINITE, cr'd, red, prism.
1224* " " brown, curv.
1225 " crystals, hollow prism
1226 " encrusting, globular
1227 WAGNERITE, cryst'd
1228+ " Kjerulfine, crystal
1229+ TRIPLITE
1230 Griphite
1231 TRIPLOIDITE
1232 SARKINITE, cryst'd
1233 DURANGITE, "
1234+ AMBLYGONITE

B. Acid and Basic Phosphates, Arsenates, etc.

1235 MONETITE
1236+ OLIVENITE, cryst'd
1237 " fibrous

1238* LIBETHENITE, cryst'd
1239* ADAMITE, "
1240* DESCLOIZITE, "
1241 " drusy, Cuprodescloizite
1242 BRACKEBUSCHITE
1243* ERINITE
1244 PSEUDOMALACHITE
1245 " Ehlite
1246* CLINOCLASITE, cryst'd
1247 DUFRENITE, "
1248+ " fibrous
1249+ LAZULITE, cryst'd
1250 ARSENIOSIDERITE, fibrous
1251 ALLACTITE
1252 SYNADELPHITE
1253 ATELESTITE

C. Hydrous Phosphates, Arsenates, etc.

Normal Division.

1254* STRUVITE, crystals
1255 ROSELITE, cryst'd
1256 BRANDTITE, cryst'd
1257 Lavendulan
1258 VIVIANITE, cryst'd, transp.
1259+ " " bladed
1260 " Mullicite
1261 SYMPLESITE
1262+ ERYTHRITE, cryst'd
1263 " foliated
1264 " earthy, "cobalt bloom"
1265* ANNABERGITE
1266* SCORODITE, cryst'd
1267 STRENGITE
1268* VARISCITE, "
1269 " massive
1270 KONINCKITE

Hydrous Phosphates, etc.
Acid Division.

1271* PHARMACOLITE
1272* NEWBERYITE, cryst'd
1273 WAPPLERITE

Hydrous Phosphates, etc.
Basic Division.

1274* CONICHALCITE
1275 BAYLDONITE
1276+ EUCHROITE, cryst'd
1277* TYROLITE, cryst'ne
1278+ CHALCOPHYLLITE, cryst'ne
1279 LUDLAMITE, cryst'd
1280 WAVELLITE, " green
1281+ " radiated, globular
1282 " " stalac., white
1283+ TURQUOIS, sky-blue
1284 " green
1285 " grayish
1286 LISKEARDITE
1287 EVANSITE
1288 Cœruleolactite
1289* PHARMACOSIDERITE, cryst'd
1290 CACOXENITE, radiated
1291 BERAUNITE, cryst'd
1292* CHILDRENITE, "
1293 EOSPHORITE
1294 MAZAPILITE, crystals
1295* LIROCONITE, cryst'd
1296 Henwoodite
1297 CHALCOSIDERITE, cryst'd
1298 PLUMBOGUMMITE
1299+ TORBERNITE, cryst'd
1300 ZEUNERITE, "
1301+ AUTUNITE, "
1302 " foliated
1303 WALPURGITE, cryst'd
1304 MIXITE "

Antimonates; also Antimonites, Arsenites.

1305* BINDHEIMITE
1306* NADORITE, cryst'd
1307* ECDEMITE, " red
1308 " yellow, Heliophyllite

Nitrates.

1309+ SODA NITER
1310 NITER

5. Borates.

1311* SUSSEXITE
1312* LUDWIGITE, cryst'ne
1313 PINAKIOLITE, cryst'd
1314 SZAIBELYITE
1315 BORACITE, cryst'd cubic form
1316 " crystals, tetrah. "
1317+ " massive
1318 WARWICKITE
1319 HOWLITE
1320 LARDERELLITE
1321 COLEMANITE, cr'd, rhomb-like
1322+ " "prism. modif.
1323 " crystal, pyram.

1324 Priceite
1325+ BORAX, crystals
1326+ ULEXITE, cryst'ne
1327 URANINITE, Broggerite, cr'd
1328 " Cleveite, "
1329+ " Pitchblende
1330* GUMMITE

6. Sulphates, Chromates, Tellurates.
A. Anhydrous Sulphates, etc.

1331 MASCAGNITE
1332* THENARDITE, cryst'd
1333 " crystals, tabular
1334 " " twins
1335 APTHITALITE, cryst'd
1336+ GLAUBERITE, " prism.
1337 " crystals, tabular
1338 BARITE, cryst'd, white, "
1339+ " " yellow, "
1340 " crystal, " prism.
1341 " cryst'd, gray, tabular
1342 " " blue
1343+ " crystal, blue, flat
1344 " cryst'd, red, acic.
1345 " " colorless
1346* " crested, white
1347 " lamellar
1348+ " granular
1349 " compact
1350 " stalactitic, pol.
1351* " fetid, brown
1352+ CELESTITE, cryst'd, prism., wh.
1353 " " modif. bluish
1354 " crystal, tab., "
1355 " cryst'd, red
1356 " fibrous
1357+ " cleavage, bluish
1358 ANGLESITE, cryst'd, tab., white
1359+ " " prism.
1360 " " pyram.
1361 " " modif. yellow
1362 " " drusy
1363* " massive
1364 ANHYDRITE, cryst'd
1365* " cleavage, red
1366+ " granular, gray
1367 " " blue
1368 CROCOITE, crystal, acicular
1369 " cryst'd, prism.
1370+ " " rhomb-like
1371 VAUQUELINITE, cryst'd

Sulphates with Chlorides, Carbonates, etc.—In Part Hydrous.

1372 KAINITE
1373 CONNELLITE, cryst'd
1374 HANKSITE, crystal, prism.
1375* " " tab.
1376+ LEADHILLITE, cryst'd, white
1377 " crystal, green

B. Acid and Basic Sulphates.

1378 LANARKITE, cryst'd
1379 CALEDONITE, "
1380+ BROCHANTITE, "
1381* LINARITE, "
1382+ MIRABILITE
1383* KIESERITE
1384 GYPSUM, Selenite, crystal, yel.
1385+ " Selenite " prism.
1386 " " crystals, phantom
1387* " " " lenticular
1388 " " cryst'd, long prism.
1389 " " " flat, red
1390 " " crystal, cross twin
1391 " " " swallow-tail "
1392* " " " lenticular "
1393 " " cont'g liquid
1394+ " " cleavage
1395 " fibrous, coarse
1396+ " " fine, Satin Spar
1397 " Plumose
1398+ " compact, Alabaster
1399* " granular, reddish
1400 " scaly, granular
1401+ EPSOMITE, cryst'd
1402* GOSLARITE, "
1403 " massive
1404 MELANTERITE, cryst'd
1405+ " fibrous
1406 " pulverulent
1407 PISANITE
1408 BIEBERITE
1409+ CHALCANTHITE, fibrous
1410 " massive
1411 SYNGENITE, cryst'd
1412 BLÖDITE, "
1413 PICROMERITE
1414 POLYHALITE, cleavage
1415 " fibrous
1416+ " granular

1417 TSCHERMIGITE
1418 PICKERINGITE
1419* HALOTRICHITE
1420 COQUIMBITE
1421+ ALUNOGEN
1422 KROHNKITE
1423 RÖMERITE

C. Hyd. Sulphates. Basic Division.

1424 LANGITE
1425 HERRENGRUNDITE, cryst'd
1426 SERPIERITE, "
1427+ COPIAPITE
1428 UTAHITE
1429 AMARANTITE, "
1430 FIBROFERRITE
1431 ALUMINITE
1432 BOTRYOGEN
1433 SIDERONATRITE
1434+ ALUNITE, cryst'd
1435 " granular
1436 " compact
1437 JAROSITE, cryst'd, rhombic
1438+ " " flat

7. Tungstates, Molybdates.

1439* WOLFRAMITE, crystal, flat
1440 " cryst'd, prism.
1441 " cryst'ne, bladed
1442+ " " lamellar
1443 " " granular
1444+ HUBNERITE, " bladed
1445* SCHEELITE, cryst'd, pyram.
1446 " " drusy
1447+ " massive
1448* STOLZITE, cryst'd, pyram., yel.
1449 " " tab., red
1450+ WULFENITE, " " "
1451 " " octah., red
1452+ " " tab., yellow
1453 " " " " transp.
1454 " " prism. yellow

VII. Salts of Organic Acids.

1455 WHEWELLITE, cryst'ne
1456* MELLITE, crystals

VIII. Hydrocarbon Compounds.

1. Simple Hydrocarbons.

1457 Hatchettite
1458+ Ozocerite
1459 Pyropissite

2. Oxygenated Hydrocarbons.

1460* Succinite, Amber
1461 Retinite
1462 Simetite
1463 Ambrite
1464+ Copalite cont'ng insects
1465 Tasmanite
1466 Idrialite

Appendix to Hydrocarbons.

1467+ Petroleum
1468+ Asphaltum
1469* Elaterite
1470 Wurtzilite
1471 Albertite
1472 Uintahite, Gilsonite
1473+ Mineral Coal, Anthracite
1474 " " Bitum., caking
1475+ " " " non-caking
1476 " " " Cannel
1477* " " " brown
1478 Peat

New Species.

1479 AGUILARITE
1480* BOLEITE, crystals
1481* CARNOTITE
1482* CUMENGEITE, crystal, trilling
1483* CYLINDRITE, cryst'ne
1484 ELPIDITE, "
1485 EPIDIDYMITE, cryst'd
1486 FRANCKEITE
1487 GEIKIELITE
1488 HANCOCKITE, cryst'd
1489* HARDYSTONITE
1490 JOSEPHINITE
1491 KNOPITE, cryst'd
1492* LAWSONITE, "
1493 LORANDITE, "
1494 NASONITE
1495* NORTHUPITE, crystal
1496 OFFRETITE, cryst'd
1497 RASPITE, "
1498 ROEBLINGITE
1499* STIBIOTANTALITE
1500 THALENITE

PLATE VII.

FIVE-DRAWER-CABINET (210 SPECIMENS).

For Nos. 15A, 27B or 111B.

PLATE VIII.

THREE-DRAWER CABINET

126-SPECIMEN-PORTABLE-CABINET

For Nos. 20A, 29B or 119B.

Elementary Standard Collections.

The arrangement, apart from the silicates, is according to the metallic constituents. Intended to accompany a short course in any popular text-book for beginners.

All specimens are correctly labeled with printed label, giving name, chemical composition, crystallization and locality, as shown in Plate II. The specimens are in every way as good—in fact, are exact duplicates of those in the more expensive advanced collections.

No. 13A. NORMAL OR HIGH-SCHOOL COLLECTION.

One hundred and eighty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $144. Glass cases, $75 extra.

Prepared especially to meet the demand among Normal and High Schools and private Academies for a collection, embracing only the common or important species and varieties. The striking colors and choice crystallizations, in which the collection abounds, make it, when properly cased, an attractive and invaluable ornament for the class room or school museum. According to the High School List. Contains a much larger number of expensive specimens than our old Collection No. 13. This revised list includes every name in Dana's summary of species.

No. 15A. Student's Collection.

One hundred and eighty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $36. Cabinet, $9 extra.

Same list as the preceding, but smaller sized specimens, making a desirable collection for those wishing to economize space and funds.

No. 18A. SECONDARY SCHOOL COLLECTION.

One hundred and twenty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $80. Glass cases, $50 extra.

An abridgment of No. 13A, arranged for schools desiring to cut down the specimens to the minimum number required in a brief course. Except in point of size, it presents nearly the same attractive and showy appearance as the foregoing, and forms an excellent nucleus about which may be conveniently gathered other important minerals. The Secondary School List is exactly as recommended by Prof. E. S. Dana.

No. 20A. Pupil's Collection.

One hundred and twenty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $20. Cabinet, $6 extra. Same as the preceding, in smaller specimens. Put up in nice typical specimens of student's size.

No. 21A. PRIMARY COLLECTION.

Sixty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $40. Glass case, $20 extra.

This limited selection is not intended for serious study, but more to interest children, by the beauty of form and color of the specimens and the utility of a few of the popularly known kinds. Excellent for illustrating nature-study talks in kindergartens and primary schools. According to Primary School List.

No. 22A. Child's Collection.

Sixty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $10. Cabinet, $3 extra. Same as preceding but smaller sized specimens.

The High School List, 180, Entire List

Nos. 13A and 15A.

Includes all minerals noted in the summarized list of species in Dana's "Minerals and How to Study Them." (Pp. 161-6.)

The Secondary School List, 120 Marked * or +

Nos. 18A and 20A.

These minerals are recommended in the Appendix of the above book as the most important for the young mineralogist to have in his collection.

The Primary School List, 60 Marked +

Nos. 21A and 22A.

Forms the final abridgment suggested for a minimum number of specimens.

The Elementary Economic List

Nos. 29A and 29B.

Includes one hundred and twenty names, numbered from 1 to 120 consecutively. It omits the silicons and silicates.

Carbon.

1 DIAMOND, crystal
2+ GRAPHITE, foliated

Sulphur.

3+ SULPHUR, native, cryst'd

Arsenic.

4 ARSENIC, native
5 REALGAR, monosulphide, red
6* ORPIMENT, trisulphide, yellow

Antimony.

7 ANTIMONY, native, cryst'ne
8+ STIBNITE, sulphide "

Bismuth.

9 BISMUTH, native, cryst'ne

Molybdenum.

10* MOLYBDENITE, sulphide, cryst'd

Gold.

11+ GOLD, native, in Quartz
12 SYLVANITE, telluride

Platinum.

13 PLATINUM, native

Silver.

14+ SILVER, native
15 ARGENTITE, sulphide, Glance
16 PYRARGYRITE, sulph-antimonite, dark Ruby Silver
17 PROUSTITE, sulph-antimonite, light Ruby Silver
18* CERARGYRITE, chloride

Mercury.

19 MERCURY, native
20+ CINNABAR, sulphide, crimson

Copper.

21+ COPPER, native
22* CHALCOCITE, sulphide
23* BORNITE, sulphide, iridescent
24+ CHALCOPYRITE, sulphide, yel.
25+ TETRAHEDRITE, sulphantim.
26+ CUPRITE, oxide, cryst'd, red
27+ MALACHITE, carbonate, green
28+ AZURITE, carbonate, blue, cr'd
29 DIOPTASE, silicate, deep green
30 CHRYSOCOLLA, " light "
31 ATACAMITE, chloride

Lead.

32 LEAD, native
33+ GALENA, sulphide, cryst'ne, cubic cleavage
34 JAMESONITE, sulphide
35 BOURNONITE, "
36+ PYROMORPHITE, phosp. cryst'd.
37* MIMETITE, arsenate, yel., cr'd
38* VANADINITE, vanadate, red, "
39 CROCOITE, chromate, red, "
40* WULFENITE, molybdate, yel., "
41+ CERUSSITE, carbonate, cryst'd
42* ANGLESITE, sulphate, "

Tin.

43 STANNITE, sulphide
44+ CASSITERITE, Stream Tin, oxid.

Titanium.

45* RUTILE, oxide, red crystals
46 OCTAHEDRITE, oxide, cryst'd
47 BROOKITE, " "
48* TITANITE, silicate "

Radium and Uranium

49 URANINITE, varying compos.
50 TORBERNITE, phos. green, cr'd
51 AUTUNITE, " yellow, "

Iron.

52 IRON, native
53+ PYRRHOTITE, sulphide, bronze
54+ PYRITE, sulphide, cryst'd
55 " " massive
56+ MARCASITE, " cryst'd
57+ ARSENOPYRITE, sulph-arsenide
58 HEMATITE, oxide, black, cr'd
59+ " " red, massive
60 MAGNETITE, " cryst'd
61+ " " Lodestone
62* FRANKLINITE, oxide
63* CHROMITE, chromate
64+ LIMONITE, oxide, brown
65+ SIDERITE, carbonate

Nickel.

66 GENTHITE, silicate
67* GARNIERITE, " green
68+ MILLERITE, sulph. cryst'ne
69* NICCOLITE, arsenide

Cobalt.

70 LINNÆITE, sulphide
71 SMALTITE, arsenide
72 COBALTITE, sulph-arsenide
73 ERYTHRITE, arsenate, red

Niobium.

74* COLUMBITE, iron niobate

Tungsten.

75 WOLFRAMITE, iron tungstate
76 SCHEELITE, calcium "

Lithium.

77 TRIPHYLITE, phosphate
78 AMBLYGONITE, fluo-phosphate
79* LEPIDOLITE, silicate

Manganese.

80* PYROLUSITE, oxide
81* MANGANITE, "
82+ RHODONITE, silicate, pink
83* RHODOCHROSITE, carb., pink

Zinc.

84+ SPHALERITE, sulphide, cryst'd
85* ZINCITE, oxide, red
86* WILLEMITE, silicate, green
87* CALAMINE, " cryst'd
88+ SMITHSONITE, carbonate

Aluminum.

89+ CORUNDUM, oxide, cryst'd
90 BAUXITE, hydrous oxide
91* SPINEL, " " cryst'd
92* CRYOLITE, fluoride
93 TURQUOIS, phosphate, blue
94* WAVELLITE, " green

Calcium.

95+ FLUORITE, fluoride, gr'n, cleav.
96 " " blue, cryst'd
97* CALCITE, carbonate, cryst'd
98+ " " Iceland Spar
99+ " " Marble, polished
100* " " Stalactite
101* " " Mex. Onyx. pol.
102 " " Calc Tufa
103+ ARAGONITE, " twin crystals
104+ APATITE, phosphate, cryst'd
105+ GYPSUM, hydrous sulphate, Selenite, cleavage
106 GYPSUM, hyd. sulp. Alabaster
107* ANHYDRITE, sulphate

Magnesium.

108* BRUCITE, hydrate
109 MAGNESITE, carbonate
110+ DOLOMITE, " Pearl Spar
111 BORACITE, chloride

Barium.

112+ BARITE, sulphate, crystal
113* WITHERITE, carb., cryst'd

Strontium.

114+ CELESTITE, sulph., blue cleav.
115* STRONTIANITE, carbonate

Sodium.

116+ HALITE, chloride, transparent cleavage
117 BORAX, crystal

Potassium.

118 SYLVITE, chloride

Rare Elements.

119* ZIRCON, Zr. silicate, crystals.
120 MONAZITE SAND, thoria, etc.

Silicon.

121+ QUARTZ, var. Rock Crystal
122* " " Smoky, crystal
123* " " Amethyst, cryst'd
124* " " Chalcedony
125* " " Agate
126+ " " Flint
127* " " Jasp'd Wood
128+ OPAL var. Precious
129+ " " Fire, red
130 " " Wood-opal, grained

Silicates—The Feldspars.

131+ ORTHOCLASE, crystal
132* " cleavage
133 MICROCLINE, var. Amazonstone, green crystal
134+ ALBITE, lamellar
135 ANORTHITE
136* OLIGOCLASE
137* LABRADORITE, chatoyant

Silicates—Various.

138* PYROXENE, var. Diopside, cr'l
139 " " Salite
140* " var. Coccolite, cryst'ne
141+ " " Augite, cryst'd
142 ENSTATITE var. Bronzite
143* SPODUMENE, cleavage
144 AMPHIBOLE var. Tremolite
145* " var. Actinolite, green
146* " " Asbestus, white
147+ " " Hornblende
148+ BERYL, green, crystal
149 GARNET var. Grossularite, cr'd
150+ " " Almandite, crystal
151+ MUSCOVITE, white Mica
152+ BIOTITE, black "
153 PHLOGOPITE, bronze, Star Mica
154* CLINOCHLORE, gr'n hydromica
155* CHRYSOLITE, Olivine
156* SCAPOLITE, pink
157* VESUVIANITE, cryst'ne
158+ EPIDOTE, cryst'd
159* ZOISITE, cryst'ne
160* TOURMALINE, rad., black, cr'd
161 " Rubellite, "
162* TOPAZ, gem crystals
163* ANDALUSITE, crystal
164* CYANITE, blue, bladed
165 SILLIMANITE, cryst'd
166 PYROPHYLLITE, radiated
167+ STAUROLITE, twin crystals
168+ TALC var. Steatite
169+ SERPENTINE, polished
170 " Chrysotile, fibrous
171* DATOLITE, cryst'd
172+ PREHNITE, green
173+ APOPHYLLITE, cryst'd
174* PECTOLITE

Silicates—The Zeolites.

175 THOMSONITE, globular
176+ NATROLITE, cryst'd
177* ANALCITE, "
178+ CHABAZITE, "
179+ STILBITE, "
180* HEULANDITE, "

Secondary School List

NOS. 18A AND 20A.

For a brief description of the following minerals, see the names marked + or * in the preceding list.

1 GRAPHITE
2 SULPHUR
3 ORPIMENT
4 STIBNITE
5 MOLYBDENITE
6 GOLD in Quartz
7 SILVER, native
8 CERARGYRITE
9 CINNABAR
10 COPPER, native
11 CHALCOCITE
12 BORNITE
13 CHALCOPYRITE
14 TETRAHEDRITE
15 CUPRITE
16 MALACHITE
17 AZURITE
18 GALENA
19 PYROMORPHITE
20 MIMETITE
21 VANADINITE
22 WULFENITE
23 CERUSSITE
24 ANGLESITE
25 CASSITERITE
26 RUTILE
27 TITANITE
28 PYRRHOTITE
29 PYRITE
30 MARCASITE
31 ARSENOPYRITE
32 HEMATITE
33 MAGNETITE
34 FRANKLINITE
35 CHROMITE
36 LIMONITE
37 SIDERITE
38 GARNIERITE
39 MILLERITE
40 NICCOLITE
41 COLUMBITE
42 LEPIDOLITE
43 PYROLUSITE
44 MANGANITE
45 RHODONITE
46 RHODOCHROSITE
47 SPHALERITE
48 ZINCITE
49 WILLEMITE
50 CALAMINE
51 SMITHSONITE
52 CORUNDUM
53 SPINEL
54 CRYOLITE
55 WAVELLITE
56 FLUORITE
57 CALCITE, cryst'd

58 CALCITE, Iceland Spar
59 " Marble
60 " Stalactite
61 " Mex. Onyx
62 " Calc Tufa
63 ARAGONITE
64 APATITE
65 GYPSUM
66 ANHYDRITE
67 BRUCITE
68 DOLOMITE
69 BARITE
70 WITHERITE
71 CELESTITE
72 STRONTIANITE
73 HALITE
74 ZIRCON
75 QUARTZ, Crystal
76 " Smoky
77 " Amethyst
78 " Chalcedony
79 QUARTZ, Agate
80 " Flint
81 " Jasp'd Wood
82 OPAL, Precious
83 ORTHOCLASE
84 ALBITE
85 OLIGOCLASE
86 LABRADORITE
87 PYROXENE, Diopside
88 " Coccolite
89 " Augite
90 SPODUMENE
91 AMPHIBOLE Trem'lite
92 " Actinolite
93 " Asbestus
94 " Hornblende
95 BERYL
96 GARNET
97 MUSCOVITE
98 BIOTITE
99 CLINOCHLORE
100 CHRYSOLITE
101 SCAPOLITE
102 VESUVIANITE
103 EPIDOTE
104 ZOISITE
105 TOURMALINE
106 TOPAZ
107 ANDALUSITE
108 CYANITE
109 STAUROLITE
110 TALC
111 SERPENTINE
112 DATOLITE
113 PREHNITE
114 APOPHYLLITE
115 PECTOLITE
116 NATROLITE
117 ANALCITE
118 CHABAZITE
119 STILBITE
120 HEULANDITE

Primary School List

NOS. 21A AND 22A.

These specimens are included in the High School List, where they are briefly described and marked +.

1 GRAPHITE
2 SULPHUR
3 STIBNITE
4 GOLD, native
5 SILVER
6 CINNABAR
7 COPPER
8 CHALCOPYRITE
9 TETRAHEDRITE
10 CUPRITE
11 MALACHITE
12 AZURITE
13 GALENA
14 PYROMORPHITE
15 CERUSSITE
16 CASSITERITE
17 PYRRHOTITE
18 PYRITE
19 MARCASITE
20 ARSENOPYRITE
21 HEMATITE
22 MAGNETITE
23 LIMONITE
24 SIDERITE
25 MILLERITE
26 RHODONITE
27 SPHALERITE
28 SMITHSONITE
29 CORUNDUM
30 FLUORITE
31 CALCITE, Spar
32 " Marble
33 ARAGONITE
34 APATITE
35 GYPSUM
36 DOLOMITE
37 BARITE
38 CELESTITE
39 HALITE
40 QUARTZ, Crystal
41 QUARTZ, Flint
42 " Jasp'd Wood
43 OPAL, Precious
44 ORTHOCLASE
45 ALBITE
46 PYROXENE
47 AMPHIBOLE
48 BERYL
49 GARNET
50 MUSCOVITE
51 BIOTITE
52 EPIDOTE
53 STAUROLITE
54 TALC
55 SERPENTINE
56 PREHNITE
57 APOPHYLLITE
58 NATROLITE
59 CHABAZITE
60 STILBITE

PLATE IX.

GLASS CASE (60 SPECIMENS).

PLATE X.

25-SPECIMEN-PORTABLE-CABINET

For Hardness and Fusibility Series and Other Short Collections.

Economic Mineralogy.

SERIES OF ORES FOR MINING SCHOOLS, PROSPECTORS AND EXPERTS.

A long experience in supplying mining schools and similar institutions has brought our facilities up to the highest standard. Great care is exercised in selecting only such examples as are suited to the special requirements of practical work. For comparison and study the material furnished affords typical examples of the ores met with in the field.

The specimens are labeled, as shown in Plate II, with printed labels, giving name, metallic contents and locality. Each specimen has likewise a number attached corresponding to a printed list.

No. 24A. SCHOOL OF MINES COLLECTION.

Four hundred specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $800. Glass cases, $120 extra.

Designed to illustrate as fully as possible the occurrence of the useful minerals in their varied forms. The more striking differences of crystal habit are included, as well as important variations in quality of ore, structure, color and mode of occurrence. An idea of the varietal representation of species will be gained by referring to the economic minerals included in the Complete Type Collection List.

The School of Mines List includes all mineral species in the Metallurgical List. Others, which are rarer and of less present commercial importance, are added. They are nevertheless of interest in the newer mining regions, where minerals once rare, are often found in marketable quantity. The commoner species are shown in much wider variety than is possible in smaller collections. This series serves the purpose of a high-grade working collection, as well as making an attractive and imposing display.

No. 24B. Mining Expert's Collection.

Four hundred specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $200. Drawer cabinet, $15 extra.

The same as the preceding, but smaller sized specimens.

No. 27A. MINING COLLECTION.

Two hundred specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $360. Glass cases, $75 extra.

The demand for a reasonably complete series of metal-bearing minerals is met by this carefully planned collection. As will be seen by referring to the list which follows, no attempt is made to represent varieties of the same mineral, except with the most important species, and then only to show certain striking differences which cannot well be omitted. It contains a large proportion of valuable ores, as well as numerous showy specimens which enliven the collection, making a fine display for the laboratory, class room or museum.

No. 27B. Prospector's Collection.

Two hundred specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $90. Cabinet, $9 extra.

Smaller size than the preceding. List below.

No. 29A. ELEMENTARY ECONOMIC COLLECTION.

One hundred and twenty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $120. Glass cases, $50 extra.

This is essentially an abridgment of No. 27A. Most of the gold, silver, radium and thorium minerals are omitted, as well as a majority of the more expensive specimens of other ores, thus greatly reducing the cost. The list is according to Professor Dana, excluding the silicon and silicate minerals. See Elementary Economic List on preceding pages. Properly displayed, it makes a splendid show in a mining office or laboratory.

No. 29B. Beginner's Economic Collection.

One hundred and twenty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $30. Cabinet, Plate VIII, $6 extra.

Same as preceding, but smaller size.

Metallurgical List.

(ENTIRE LIST FORMS COLLECTION NO. 27A AND 27B.)

Gold, Silver and Platinum Minerals.

Nos. 34A and 34B.

Gold (with some Silver).

1 GOLD, native, grains in Quartz
2 " " dust
3 " " nugget
4 " " electrum, cryst'd
5 " " in conglomerate
6 PETZITE, telluride
7 SYLVANITE, " cryst'd
8 CALAVERITE, " "
9 NAGYAGITE, sulpho-telluride

Silver.

10 SILVER, native, plates
11 " " wire
12 DYSCRASITE, antimonide
13 ARGENTITE, sulphide
14 HESSITE, telluride
15 GALENA, lead sulphide, argentif.
16 PYRARGYRITE, sulph-antim'nite
17 PROUSTITE, sulph-arsenite
18 STEPHANITE, sulph-antimonite

19 POLYBASITE, sulph-antimonite
20 CERARGYRITE, chloride
21 EMBOLITE, chloro-bromide
22 IODYRITE, iodide

Platinum, etc.

23 PLATINUM, native
24 SPERRYLITE, arsenide
25 IRIDOSMINE, Ir. Os., etc., native

Iron Minerals.

Nos. 37A and 37B.

26 IRON, native, meteoric, with Ni
27 " " terrestrial " "
28 PYRITE, sulphide, cubic
29 " " octahedral
30 " " pyritohedral
31 " " massive
32 MARCASITE, " cryst'd
33 HEMATITE, oxide, cr'd, rhomb.
34 " " " tabular
35 " " Pencil Ore
36 " " Specular "
37 " " micaceous
38 " " Oölitic
39 MARTITE, " cryst'd
40 MAGNETITE, " "
41 " " granular
42 " " Lodestone
43 GÖTHITE, "
44 LIMONITE, " brown ore
45 " " rounded, bl'k
46 " " Yellow Ochre
47 SIDERITE, carbonate, cryst'd
48 " " massive
49 DUFRENITE, phosphate
50 MELANTERITE, sulphate

Lead, Antimony, Zinc and Cadmium Minerals.

Nos. 38A and 38B.

Lead.

51 GALENA, sulphide, cubic cleav.
52 JAMESONITE, sulphantimonite
53 CERUSSITE, carb., white, cr'd
54 " " brown
55 PHOSGENITE, chlorocarbonate
56 WULFENITE, molybdate
57 PYROMORPHITE, phosph., cr'd
58 ANGLESITE, sulphate, cryst'd
59 CROCOITE, chromate, "

Antimony.

60 ANTIMONY, native
61 STIBNITE, sulphide
62 SENARMONTITE, oxide
63 CERVANTITE, "
64 BINDHEIMITE, lead antimonate
65 NADORITE, lead chlor- "

Zinc.

66 SPHALERITE, sulph., Ruby, cr'd
67 " " Bl'k Jack, "
68 ZINCITE, oxide
69 FRANKLINITE, oxide (Fe & Mn)
70 SMITHSONITE, carbonate
71 AURICHALCITE, " (& copper)
72 HYDROZINCITE, "
73 WILLEMITE, silic., massive
74 CALAMINE, silicate, cryst'd

Cadmium.

75 GREENOCKITE, sulphide

Copper Minerals.

Nos. 39A and 39B.

76 COPPER, native, massive
77 " " in conglomerate
78 " " cryst'd
79 DOMEYKITE, arsenide
80 CHALCOCITE, sulphide, cryst'd
81 " " massive
82 COVELLITE, "
83 BORNITE, " (and iron)
84 CHALCOPYRITE, " cr'd (& ")
85 " " massive "
86 TETRAHEDRITE sulphantim'nite
87 ENARGITE, sulpharsenate
88 ATACAMITE, chloride
89 CUPRITE, oxide, cryst'd
90 " " massive
91 MELACONITE, oxide
92 MALACHITE, green carb., capil.
93 " " " pseud.
94 " " " massive
95 AZURITE, blue carb., cryst'd
96 " " " massive
97 CHRYSOCOLLA, silicate
98 PSEUDOMALACHITE, phosphate
99 CLINOCLASITE, arsenate
100 BROCHANTITE, sulphate

Lithium, Barium, Strontium, Sodium, Potassium, Magnesium, Calcium, Boron and Carbon Minerals.

Nos. 40A and 40B.

Lithium.

101 SPODUMENE, silicate (and Al)
102 LEPIDOLITE, fluo-sil. (& Al & K)
103 AMBLYGONITE, fluo-phos. (& Al)

Barium.

104 WITHERITE, carbonate
105 BARITE, sulphate, cryst'd
106 " " massive

Strontium.

107 STRONTIANITE, carbonate
108 CELESTITE, sulphate

Sodium and Potassium.

109 HALITE, chloride of sodium
110 CRYOLITE, fluoride of " Al, etc.
111 SODA NITRE, nitrate of sodium
112 SYLVITE, chloride of potassium
113 POLYHALITE, sulphate of potassium, Ca, Mg, etc.

Calcium, Magnesium and Boron.

114 KIESERITE, sulphate of magnes.
115 CARNALLITE, chloride of magnesium (and K)
116 MAGNESITE, carb. of magnes.
117 CALCITE, " " calcium
118 BORAX, borate of sodium

Carbon.

119 DIAMOND, native, crystal
120 GRAPHITE, " massive
121 OZOCERITE, hydrocarbon, wax
122 COPALITE, " resin
123 PETROLEUM, " oil
124 ASPHALTUM, " pitch
125 ANTHRACITE, " coal

Nickel, Cobalt, Chromium, Manganese and Aluminum Minerals.

Nos. 41A and 41B

Nickel.

126 NICCOLITE, arsenide
127 MILLERITE, sulphide
128 BREITHAUPTITE, antimonide
129 PYRRHOTITE, sulphide (& iron)
130 ZARATITE, carbonate
131 GARNIERITE, silicate
132 ANNABERGITE, arsenate

Cobalt.

133 SMALTITE, arsenide
134 COBALTITE, sulph-arsenide
135 ASBOLITE, oxide (and Mn)
136 ERYTHRITE, arsenate

Chromium.

137 CHROMITE, iron chromate

Manganese.

138 ALABANDITE, sulphide
139 PYROLUSITE, oxide
140 MANGANITE, "
141 PSILOMELANE, "
142 WAD, oxide
143 RHODOCHROSITE, carbonate
144 RHODONITE, silicate

Aluminum.

145 CORUNDUM, oxide, crystal
146 " oxide, Emery, granular
147 BAUXITE, "
148 KAOLINITE, silicate
149 PYROPHYLLITE, "
150 ALUNOGEN, sulphate

Rare Element Minerals.

NOTE.—List is revised and new collections prepared as the knowledge of the rare elements advances.

Nos. 42A and 42B.

Radium, Uranium, Thorium and other radio-active elements.

151 URANOPHANE, uran., radium, &c.
152 FERGUSONITE, " " "
153 YTTROTANTALITE, " " "
154 EUXENITE, " " "
155 TORBERNITE, " " "
156 AUTUNITE, " " "
157 CLEVEITE, " " "
158 URANINITE, " " "
159 GUMMITE, " " "
160 CARNOTITE. " " "
161 THORITE, thor. metals silic., "
162 ÆSCHYNITE, " " " "
163 MONAZITE SAND, thoria, etc.

Yttrium and Cerium metals.

164 GADOLINITE, yttr. met., silic., &c.
165 THALENITE, " " "
166 SAMARSKITE, " niobate, "
167 HIELMITE, " tantal., "
168 XENOTIME, " phosphate
169 FLUOCERITE, cer. met., fluoride
170 BASTNASITE, " fluocarb.
171 ALLANITE, " silic., etc.
172 CERITE, " " "
173 MONAZITE cryst., " phosphate
174 CYRTOLITE, silicate

Zirconium.

175 ZIRCON, silicate, crystals

Nos. 43A and 43B.

Tin.

176 CASSITERITE, oxide, cryst'd
177 " " massive
178 " " Stream Tin
179 STANNITE, sulphide

Tungsten.

180 WOLFRAMITE, iron tungstate (and Mn)
181 HUBNERITE, manganese tungstate (and iron)
182 SCHEELITE, calcium tungstate

Titanium.

183 ILMENITE, oxide (and iron)
184 RUTILE, " red, cryst'd
185 " " black (& iron)

Molybdenum.

186 MOLYBDENITE, sulphide, cryst'd
187 MOLYBDITE, oxide

Vanadium.

188 ENDLICHITE, lead vanadate and arsenate, cryst'd
189 VANADINITE, lead vanad. cr'd

Niobium and Tantalum.

190 COLUMBITE, Fe niobate (& Ta)
191 TANTALITE, "tantalate (&Nb)

Arsenic.

192 ARSENIC, native
193 REALGAR, sulphide, red
194 ORPIMENT, " yellow
195 ARSENOPYRITE, iron sul.-arsen.

Mercury.

196 MERCURY, native
197 CINNABAR, sulphide

Bismuth and Selenium.

198 BISMUTH, native
199 BISMUTHINITE, sulphide
200 GUANAJUATITE, selenide

The following collections accord with the above Metallurgical List. Glass cases to hold twenty-five specimens, 12 x 9 cm., each ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), cost $15 extra. A flat oak case, with lid, holding twenty-five specimens, 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), $2 extra. The same for fifty specimens, $3.

No. 34A. ORES OF GOLD, SILVER, PLATINUM, ETC.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $100.

No. 34B. Ores of Gold, Silver, Platinum, etc.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $25.

No. 37A. ORES OF IRON.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $20.

No. 37B. Ores of Iron.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), $5.

No. 38A. ORES OF LEAD, ANTIMONY, ZINC AND CADMIUM.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $20.

No. 38B. Ores of Lead, Antimony, Zinc and Cadmium.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $5.

No. 39A. ORES OF COPPER.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $20.

No. 39B. Ores of Copper.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $5.

No. 40A. ORES OF BARIUM, STRONTIUM, SODIUM, POTASSIUM, MAGNESIUM, CALCIUM, BORON AND CARBON.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $20.

No. 40B. Ores of Barium, Strontium, Sodium, Potassium, Magnesium, Calcium, Boron and Carbon.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $5.

No. 41A. ORES OF NICKEL, COBALT, CHROMIUM, MANGANESE AND ALUMINUM.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $40.

No. 41B. Ores of Nickel, Cobalt, Chromium, Manganese and Aluminum.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $10.

No. 42A. ORES OF RADIUM, URANIUM, THORIUM, YTTRIUM AND THE CERIUM METALS, ZIRCONIUM.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $100.

No. 42B. Ores of Radium, Uranium, Thorium, Yttrium and the Cerium Metals, Zirconium.

Twenty-five specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $25.

No. 43A. ORES OF TIN, TUNGSTEN, TITANIUM, MOLYBDENUM, VANADIUM, NIOBIUM AND TANTALUM, ARSENIC, MERCURY, BISMUTH AND SELENIUM.

Twenty-five specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $40.

No. 43B. Ores of Tin, Tungsten, Titanium, Molybdenum, Vanadium, Niobium and Tantalum, Arsenic, Mercury, Bismuth and Selenium.

Twenty-five specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $10.

No. 44A. ORE ASSOCIATIONS.

Sixty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $48. Glass case, $30 extra. Includes all the more important minerals commonly found associated with valuable ores. List below.

No. 44B. Ore Associations.

Sixty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $12. Cabinet, $3 extra. According to the following list.

1 ALBITE
2 ANALCITE
3 AMPHIBOLE
4 APATITE
5 APOPHYLLITE
6 ARAGONITE
7 ARSENOPYRITE
8 AZURITE
9 BARITE
10 BERYL
11 CALAMINE
12 CALCITE
13 CELESTITE
14 CERVANTITE
15 CHALCOCITE
16 CHALCOPYRITE
17 CHRYSOCOLLA
18 CORUNDUM
19 DATOLITE
20 DOLOMITE
21 ENDLICHITE
22 EPIDOTE
23 FLUORITE
24 FRANKLINITE
25 GALENA
26 GARNET
27 GYPSUM
28 HEMATITE
29 HEULANDITE
30 KAOLINITE
31 MAGNETITE
32 MALACHITE
33 MARCASITE
34 MUSCOVITE
35 OLIGOCLASE
36 ORTHOCLASE
37 PECTOLITE
38 PHLOGOPITE
39 PREHNITE
40 PYRITE
41 PYROXENE
42 PYRRHOTITE
43 QUARTZ
44 RHODONITE
45 SERPENTINE
46 SIDERITE
47 SPHALERITE
48 SPODUMENE
49 STIBNITE
50 TALC
51 TETRAHEDRITE
52 TOPAZ
53 TOURMALINE
54 WAD
55 WITHERITE
56 WOLFRAMITE
57 WOLLASTONITE
58 WULFENITE
59 ZIRCON
60 ZOISITE

No. 45A. POLISHED ORNAMENTAL STONES.

Twenty-five specimens, natural edges, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $80. Small glass wall case, $15 extra. A small series of beautiful minerals in common use for interior decoration and ornamental art. Forms by far the most beautiful aggregation of color we prepare. The artistic arrangement it permits, offers an altogether unexpected and dazzling display, in comparison with scientifically prepared collections. As an adjunct to the latter, however, it has an acknowledged value, in view of the growing importance of the decorative arts in the educational world. While the cost per specimen is quadruple that of other short collections, either of these ornamental series makes a most beautiful and acceptable gift to an individual or institution.

No. 45B. Polished Ornamental Stones.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $20. Same as above, but smaller. Oak cabinet, $2 extra.

1 ROCK CRYSTAL
2 RUTILATED QUARTZ
3 ROSE QUARTZ
4 JASPER
5 JASPERIZED WOOD
6 BRECCIA
7 HELIOTROPE
8 TIGER-EYE
9 BANDED AGATE
10 MOCHA STONE
11 MOSS AGATE
12 WOOD OPAL
13 JADE
14 MALACHITE
15 SERPENTINE
16 AMAZON-STONE
17 SODALITE
18 LAPIS-LAZULI
19 FLUORITE
20 LABRADORITE
21 RHODONITE
22 MEXICAN ONYX
23 MARBLE
24 ALABASTER
25 SATIN SPAR

No. 46A. ROUGH PRECIOUS AND SEMI-PRECIOUS STONES.

Twenty-five small specimens, $15. These are mostly of good quality although not the best, as it is not necessary to have a flawless rough stone to indicate the general characteristics of valuable gem material. The colors represented are usually in the more highly prized shades. The following comprise the collection.

1 DIAMOND
2 CORUNDUM, Ruby
3 " Sapphire
4 " Star Sapphire
5 " "Montana" Sapphire
6 TOPAZ, white
7 " yellow
8 BERYL, Emerald
9 " Aquamarine
10 " golden
11 CHRYSOBERYL, "Cats Eye"
12 SPINEL, Ruby
13 " blue
14 TOURMALINE, green
15 " Rubellite, pink
16 ZIRCON, Hyacinth
17 GARNET, Pyrope
18 " Spessartite
19 QUARTZ, Amethyst
20 CHRYSOLITE, Olivine
21 OPAL, precious, blue-green
22 " " milky
23 " " matrix
24 " " fire
25 TURQUOIS

No. 48A. AMERICAN ROCK COLLECTION.

We do not aim to supply petrographers, but the following elementary collection of typical common rocks is offered. Each specimen is labeled with name and locality, and has a number attached corresponding to this list.

Sixty specimens, 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $24. Glass case, $30 extra.

No. 48B. American Rock Collection.

Sixty specimens, 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $6. Cabinet, $3 extra. The entire list given below.

1	LIMESTONE, lithographic	31	GRANULYTE, Pegmatyte
2	" hydraulic	32	GNEISS
3	" Chalk	33	GREISEN
4	" Oölite	34	MICA SCHIST
5	" fossiliferous	35	HYDROMICA SCHIST
6	" shell, Coquina	36	FELSITE, Petrosilex
7	" Marl	37	PORPHYRY
8	" Travertine	38	TRACHYTE
9	" Marble, fine	39	OBSIDIAN
10	" coarse	40	PUMICE
11	DOLOMITE	41	SYENYTE
12	CONGLOMERATE, Puddingstone	42	QUARTZ SYENYTE
13	" Breccia	43	SYENYTE GNEISS
14	GRIT, Millstone	44	DITROYTE
15	SANDSTONE, concretions	45	DIORYTE
16	" argillaceous	46	ANDESYTE
17	" ferruginous, red	47	GABBRO
18	SHALE	48	DIABASE
19	ARGILLYTE, Slate	49	DOLERYTE, Basalt
20	KAOLINITE	50	PYROXENYTE
21	BRICK CLAY	51	AMPHIBOLYTE
22	TRIPOLYTE	52	AMPHIBOLE SCHIST
23	QUARTZYTE	53	EPIDOSYTE
24	ITACOLUMYTE	54	PERIDOTYTE
25	CHERT	55	CHLORITE SCHIST
26	JASPER	56	TALCOSE "
27	BUHRSTONE	57	STEATITE, Soapstone
28	GRANITE, red	58	" French Chalk
29	" gray, coarse	59	SERPENTINE, granular
30	" " fine	60	" Verde Antique

No. 51A. ROCK-FORMING MINERALS.

Sixty specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $36. Glass case, $30 extra. The new list includes the most important minerals mentioned in Rosenbusch-Iddings' "Microscopic Physiography of Rock-Making Minerals," and Zirkels' "Handbuch der Petrographie."

No. 51B. Rock-Forming Minerals.

Sixty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $9. Cabinet, $3 extra. A much more comprehensive set than our old No. 51. List follows.

Rock-Forming Minerals.

The specific gravities given are only average values.

1	CASSITERITE	6.84	31	TOURMALINE	3.10
2	HEMATITE	5.30	32	ACTINOLITE	3.02
3	MAGNETITE	5.20	33	BIOTITE	3.01
4	ILMENITE	4.75	34	PREHNITE	2.94
5	CHROMITE	4.46	35	DOLOMITE	2.90
6	ZIRCON	4.45	36	WOLLASTONITE	2.86
7	RUTILE	4.25	37	MUSCOVITE	2.85
8	BROOKITE	4.14	38	CHLORITE	2.78
9	CORUNDUM	3.95	39	ANORTHITE	2.76
10	PYROPE	3.75	40	LAZULITE	2.75
11	STAUROLITE	3.74	41	TALC	2.74
12	DISTHENE	3.60	42	BERYL	2.72
13	TOPAZ	3.56	43	CALCITE	2.72
14	GROSSULAR	3.50	44	LABRADORITE	2.69
15	AUGITE	3.50	45	QUARTZ	2.65
16	ACMITE	3.49	46	OLIGOCLASE	2.64
17	TITANITE	3.48	47	ALBITE	2.63
18	OLIVINE	3.41	48	ELÆOLITE	2.60
19	VESUVIANITE	3.40	49	ORTHOCLASE	2.57
20	EPIDOTE	3.39	50	SANIDINE	2.56
21	ZOISITE	3.35	51	NEPHELINE	2.55
22	AXINITE	3.29	52	LEUCITE	2.47
23	SILLIMANITE	3.23	53	CANCRINITE	2.46
24	HORNBLENDE	3.22	54	GYPSUM	2.31
25	ANDALUSITE	3.20	55	SODALITE	2.28
26	BRONZITE	3.19	56	NATROLITE	2.23
27	FLUORITE	3.18	57	OPAL	2.21
28	ANTHOPHYLLITE	3.17	58	ANALCITE	2.19
29	APATITE	3.16	59	HYALITE	2.17
30	SPODUMENE	3.14	60	CHABAZITE	2.10

PLATE XI.

COMPLETE CRYSTAL COLLECTION, NO. 73A,
IN SPECIAL CABINET.

PLATE XII.

SAMPLE CRYSTAL SET, NO. 79A,

In Special Cabinet. Glass Top if so Ordered.

Crystallography.

LOOSE CRYSTALS FOR MEASUREMENT AND STUDY.

In no department is greater improvement and progress shown than in meeting the demands of the crystallographer—whether the mathematician seeking new and rare forms for investigation or the student beginning an elementary course.

Not only have the varied needs of scientists and educators been studied and the several collections entirely revised and extended accordingly, but the selection of the specimens themselves has been done by a competent mineralogist, under the advice and criticism of several high authorities. The crystals have been measured individually, whenever necessary to insure correct classification.

Prominent teachers of crystallography, well known as writers on the subject, have examined in detail the Complete Type Collection, and expressed surprise at finding such a unique and excellent series on sale. A prevailing opinion was voiced in the remark that the real worth of so extensive a collection, can only be appreciated by one who has attempted its preparation. With this generous approval came valuable suggestions which have been adopted.

THE ADVANCED COLLECTIONS, while much superior to those obtainable in the past, will be improved with the growth of our stock and the progress of the science. Twelve of these, corresponding to the Descriptive List, have been prepared simultaneously. The aggregate changes, as shown in future collections, will mean improvement. The arrangement and definitions in Dana's "Text-book of Mineralogy," have been carefully followed, making the sets especially valuable to those using this work or that of Penfield. The chapter on crystallography in his "Determinative Mineralogy," is well illustrated by this collection, and most of the Penfield crystal forms are shown. Any other desired arrangement may be prepared on order. The aim has been to represent well as large a number of forms as possible. A duplication of any combination has been avoided, even though occurring in different minerals. Variety of form, not species, is the object. As many groups as possible are represented under each of the six systems. Out of thirty-two possible groups, only twenty-three are known in nature. Of these, every one is represented in the longer list. Thus in one sense the title "complete" is not a misnomer.

The crystals selected are the best our facilities afford. They range generally from 1 to 4 cm. in length, and nearly all possess sufficiently sharp angles and bright planes for measurement with the reflecting goniometer. The majority are large enough for contact measurement.

The cabinets holding the crystals are made according to our latest designs, especially for these collections. See Plate XI. They are well made and handsomely finished in the best quartered oak. The 4 x 3 cm. white glazed pasteboard trays strikingly display the crystals. Each collection is numbered to correspond to a list, which gives both name and locality and full description of the form in the case of the advanced collections.

Special collections or parts of the listed collections are prepared on order.

Advanced.

No. 73A. COMPLETE CRYSTAL COLLECTION.

Three hundred measurable crystals in drawer cabinet. See Plate XI. As described in the Complete Crystal List. This set evenly covers the whole field of crystallography. $150.

No. 75A. ABRIDGED CRYSTAL COLLECTION.

One hundred and fifty measurable crystals, as shown in the Abridged Crystal List. A careful elimination of rare and less important forms is here effected. In cabinet, $60. Similar to Plate XII.

Complete Crystal Collection.

No. 73A, ENTIRE LIST, 300.

Abridged List.

No. 75A, NAMES MARKED +, 150.

I. Isometric System.

Normal Group—Galena Type.

1+ Cube ..... GALENA
2+ Octahedron ..... SPINEL
3+ Dodecahedron ..... GARNET
4+ Tetrahexahedron modifying cube ..... FLUORITE
5 Trigonal trisoctahedron modifying octahedron ... PYRITE
6+ Trapezohedron ..... GARNET
7+ Hexoctahedron modifying cube ..... FLUORITE

Combinations—

8+ Cube modified by octahedron *o* ..... GALENA
9+ " " " trapezohedron *m* ..... FLUORITE
10 Octahedron modified by cube *a* ..... GALENA
11+ " " " dodecahedron *d* ..... MAGNETITE
12+ " " " " *d* and trapezohedron *m* ..... MICROLITE

13 Octahedron modified by dodecahedron *d*, trapezohedron *m* and cube *a*.....MICROLITE
14+ Dodecahedron modified by cube *a*.....FLUORITE
15 " " " octahedron *o*.....CUPRITE
16+ " " " trapezohedron *m*.....GARNET
17 Trapezohedron " " dodecahedron *d*..... "

Pyritohedral Group—Pyrite Type.

18+ Pyritohedron.....PYRITE
19+ Cube..... "
20+ Octahedron..... "
21 Pyritohedron modified by cube *a*..... "
22+ " " " octahedron *o*..... "
23 " " " cube *a* and octahedron *o*. "
24 " " " octahedron *o* & diploid *s*. "
25+ Cube modified by pyritohedron *e*..... " alt.
26+ " " " diploid *s*..... "
27 Octahedron modified by pyritohedron *e*..... "
28 " " " diploid *s*..... " alt.

Tetrahedral Group—Tetrahedrite Type.

29+ Tetrahedron modified by trigonal tristetrahedron *n*.....TETRAHEDRITE
30 Tetrahedron modified by cube *a* and dodecahedron *d*.....BORACITE
31+ Tetrahedron plus and minus, tetrahedral symmetry.....ZUNYITE
32 Tetrahedron plus and minus, octahedral symmetry.....DIAMOND

Gyroidal or Plagihedral Group—Cuprite Type.

33 Trapezohedral symmetry.....SAL-AMMONIAC

Tetartohedral Group—Ullmannite Type.

34+ Cubic symmetry.....ULLMANNITE

Groups Unidentified.

35+ Cubic symmetry.....BOLEITE
36+ Octahedral symmetry.....DYSANALYTE
37+ Trapezohedral " .....LEUCITE
38 Cubo-octahedral " .....DYSANALYTE

II. Tetragonal System.

Normal Group—Zircon Type.

39+ Unit pyramid *p*.....ZIRCON
40 " " *p* and base *c*.....OCTAHEDRITE
41+ " prism *m* and unit pyramid *p*.....ZIRCON
42+ " " *m* and two unit pyramids *p* and *u*.... "
43 " and diametral prisms *m* and *a* and two unit pyramids *p* and *u*..... "

44+ Unit and diametral prisms *m* and *a* and base *c*... VESUVIANITE
45 " " " " *m* " *a*, unit and diametral pyramids *p* and *e* and base *c* ..... "
46+ Diametral prism *a* and unit pyramid..... HYACINTH
47 Unit and diametral prisms *m* and *a* and unit pyramid *p*..... MALACON
48+ Unit, diametral and ditetragonal prisms *m*, *a* and *l* and diametral pyramid *e*..... RUTILE
49 Unit, diametral and ditetragonal prisms *m*, *a* and *l*, unit and diametral pyramids *e* and *s*.... "
50 Diametral prism *a*, unit pyramid *p* and ditetragonal pyramid or zirconoid *x*..... HYACINTH
51 Diametral prism *a* and base *c*..... APOPHYLLITE
52+ " " *a* " unit pyramid *p*..... "
53+ " " *a*, unit pyramid *p* and base *c*.... "
54 " " *a*, two unit pyramids *p* and *r*, and diametral pyramid *e*..... ANATASE

Pyramidal Group—Scheelite Type.

55+ Unit pyramid *p*..... SCHEELITE
56 " and diametral pyramids *p* and *e* and base *c*.. STOLZITE
57 " " " prisms *m* and *a* and unit pyramid *p*..... WERNERITE

Pyramidal-Hemimorphic Group—Wulfenite Type.

58+ Unit pyramid *u* and base *c*..... WULFENITE
59+ Two unit pyramids *e* and *u*, two diametral pyramids *n* and *s* and base *c*..... "
60 Unit prism *m* rounded, and base *c*..... "

Sphenoidal Group—Chalcopyrite Type.

61+ Sphenoid of first order *p*..... CHALCOPYRITE
62+ Two sphenoids plus and minus, octahedral symmetry ..... "
63 Acute sphenoid Φ and scalenohedron *x*..... "

III. Hexagonal System.

Normal Group—Beryl Type.

64+ Unit prism *m* and base *c*..... BERYL
65+ " " *m*, unit pyramid *p* and base *c*..... HANKSITE
66 " and second order prisms *m* and *a*, dihexagonal prism and base *c*..... BERYL

Hemimorphic Group—Iodyrite Type.

67 Unit prism *m* and base *c*..... IODYRITE

Pyramidal Group—Apatite Type.

68+ Unit prism *m* and unit pyramid *x*..... APATITE
69 " " *m* and base *c*..... PYROMORPHITE
70 " " *m*, unit pyramid *x* and base *c*..... APATITE
71 " " and second order prisms *m* and *a* and unit pyramid *p*..... "

72 Unit and second order prisms *m* and *a*, two unit pyramids *x* and *r*, second order pyramid and base *c* ..... APATITE

Pyramidal-Hemimorphic Group—Nephelite Type.

73 Unit prism *m* and base *c* ..... NEPHELITE

Rhombohedral Division.

Normal Group—Calcite Type.

74+ Rhombohedron *r* ..... CALCITE
75 " 73° ..... SIDERITE
76 " about 85° ..... CHABAZITE
77+ Flat " *e* ..... CALCITE
78+ Acute " *M* ..... SILIC. CALCITE
79 " " and base *c* ..... SIDERITE
80+ Positive and negative rhombohedrons and scalenohedron ..... CALCITE
81+ Scalenohedron *v* ..... "
82 " *v* and base *c* ..... "
83+ " and one rhombohedron *r* ..... "
84 Two " ..... "
85 Unit prism *m* and base *c* ..... "
86+ " " *m* " rhombohedron *e* ..... "
87+ " " *m* " " *e* and scalenohedron *v* ..... "
88 Three scalenohedrons and two rhombohedrons .... "
89 Unit prism *m*, four rhombohedrons and two scalenohedrons ..... "
90+ Acute pyramid, second order ..... SILIC. CALCITE
91 Pyramid of second order *n* and base *c* ..... CORUNDUM
92 Prism " " " *a* " " *c* ..... "
93+ Pyramid " " " *n*, rhombohedron *r* and curved rhombohedron *u* ..... HEMATITE
94 Unit prism *m*, rhombohedron *r*, pyramid of second order *n* and base *c* ..... "

Hemimorphic Group—Tourmaline Type.

95+ Unit and second order prisms *m* and *a* and two rhombohedrons *r* and *o* ..... TOURMALINE
96 Unit and second order prisms *m* and *a*, two rhombohedrons *r* and *o* and base *c* ..... "
97+ Triangular prism, striated and rhombohedron *o* .. "

Tri-rhombohedral Group—Phenacite Type.

98+ Unit and second order prisms *m* and *a* and third order rhombohedron *x* ..... PHENACITE
99+ Unit and second order prisms *m* and *a*, and two rhombohedrons *r* and *e* ..... WILLEMITE
100+ Acute rhombohedron *M*, obtuse rhombohedron and base *c* ..... DOLOMITE

Trapezohedral Group—Quartz Type.

101 Two rhombohedrons *r* and *z*.... .....QUARTZ
102+ Unit prism *m* and rhombohedrons *r* and *z*..... "
103+ " " *m*, " *r* " *z* and trigonal pyramid *s*..... "
104+ Unit prism *m*, rhombohedrons *r* and *z* and acute rhombohedron *M*..... "
105+ Unit prism *m*, rhombohedrons *r* and *z*, trigonal pyramid *s* and trigonal trapezohedron *x*. Right-handed crystal..... "
106+ Unit prism *m*, rhombohedrons *r* and *z*, trigonal pyramid *s* and trigonal trapezohedron *x*. Left-handed crystal..... "
107 Acute rhombohedron *n*, striated and base *c*.....CINNABAR

IV. Orthorhombic System.

Normal Group—Barite Type.

108 Macrodome *d* and brachydome *o*.....BARITE
109+ Unit prism *m*, macrodome *d* and base *c*..... "
110 " " *m*, " *d*, brachypinacoid *b*, pyramid and base *c*..... "
111 Unit prism *m*, macrodome *d*, brachydome *o*, brachypinacoid *b*, pyramids and base *c*..... "
112+ Unit prism *m*, macrodome *d*, brachydome *o*, brachypinacoid *b* and base *c*..... "
113+ Macrodome *d*, macropinacoid *a*, two brachydomes and base *c*..... "
114 Unit prism *m*, macrodome *d*, brachydome *o* and base *c*.....CELESTITE
115 Unit and obtuse pyramids *p* and *s* and brachydome *n*.....SULPHUR
116+ Unit and obtuse pyramids *p* and *s*, brachydome *n* and base *c*..... "
117 Unit and obtuse pyramids *p* and *s* and base *c*. Sphenoidal type..... "
118 Unit prism *m*, brachypinacoid *b* and three pyramids *p*, *s* and *r*.....STIBNITE
119 Unit prism *m* and brachydome *u*.....ARSENOPYRITE
120+ " " *m* " base *c*.....MARCASITE
121+ " " *m*, macrodome *t* and base *c*, striated..THENARDITE
122+ " " *m* and base *c*.....ANDALUSITE
123 " " *m*, macrodome *d* and base *c*.....BOUGLISITE
124 " " *m*, " *d*, pyramids and base *c*.ANGLESITE
125+ " " *m*, macrodomes *d* and *l*, brachydome *o*, macropinacoid *a*, pyramids and base *c*..... "
126 Unit prism *m*, macrodome *d*, macropinacoid *a* and base *c*..... "
127 Unit prism *m*, pyramids *e* and *z* and brachydome *t*.BROOKITE
128 " " *m* and pyramid *z*..... "
129+ " " *m* " pyramids *e* and *z*..... "

130 Macrodome *r* and brachydome *b*, striated.....ANHYDRITE
131 Unit and brachyprisms *m* and *l* and unit pyramids *p*.....TOPAZ
132 Unit and brachyprisms *m* and *l* and two brachydomes *f* and *y*..... "
133 Unit and brachyprisms *m* and *l*, brachydome *y* and base *c*..... "
134+ Unit and brachyprisms *m* and *l*, unit and obtuse pyramids *p* and *o*, brachydome *y* and base *c*.... "
135 Unit and brachyprisms *m* and *l*, two brachydomes *f* and *y*, pyramids and base *c*..... "
136+ Unit and brachyprisms *m* and *l*, unit and obtuse pyramids *p* and *o*, brachydome *y*, macrodome *d* and base *c*..... "
137+ Unit and brachyprisms *m* and *l*, unit and obtuse pyramids *p* and *o*, brachydome *y*, brachypinacoid *b*, macrodome *d* and base *c*..... "
138+ Unit prism *m*, brachypinacoid *b* and base *c*.....STAUROLITE
139 Unit prism *m*, brachypinacoid *b*, one set of macrodomes *r* and base *c*..... "
140+ Unit prism *m*, brachypinacoid *b*, two sets of macrodomes *r* and base *c*..... "
141+ Unit prism *m*, brachypinacoid *b*, brachydome *k* and pyramids (twinned).....ARAGONITE
142 Unit prism *m*, pyramid *p*, brachydome *i* and brachypinacoid *b*.....CERUSSITE
143 Unit prism *m*, brachypinacoid *b*, brachydome *t*, macrodome *e*, pyramids *n* and *q* and base *c*.....HERDERITE
144 Unit prism *m* and brachydome *e*.....LIBETHENITE
145 " " *m* " pyramid *r*, striated.....CHILDRENITE
146 Macropinacoid *a*, brachypinacoid *b*, macrodome *k*, pyramids *o* and *u* and base *c*.....COLUMBITE
147 Unit prism *m*, prism *g*, macropinacoid *a*, macrodomes *h*, *k* and *l*, pyramids and base *c*..... "
148+ Unit prism *m*, macro- and brachypinacoids *a* and *b*, brachydome *q*, pyramid *r* and base *c*.....ENSTATITE

Hemimorphic Group—Calamine Type.

149 Unit prism *m*, macropinacoid *a*, brachypinacoid *b*, two macrodomes and brachydome *i*.....CALAMINE
150 Unit prism *m*, brachypinacoid *b*, brachydome *d* and base *c*.....STEPHANITE
151 Macrodome *s*, brachypinacoid *b* and base *c*.....STRUVITE
152 Unit prism *m*, macrodome *s* and base *c*..... "

Sphenoidal Group—Epsomite Type.

153 Unit prism *m*, sphenoid *z*, plus and minus.....EPSOMITE

V. Monoclinic System.

Normal Group—Gypsum Type.

154+ Unit prism *m*, clinopinacoid *b* and unit pyramid *p*.....GYPSUM

155+ Unit prism *m*, clinopinacoid *b*, unit pyramid *p* and orthodome *e*.....GYPSUM
156 Unit and clinoprisms *m* and *k*, clinopinacoid *b*, unit pyramid *p* and orthodome *e*..... "
157 Unit prism *m*, clinopinacoid *b* and base *c*.....ORTHOCLASE
158+ Unit prism *m*, clinopinacoid *b*, orthodome *y* and base *c*..... "
159+ Unit prism *m*, prism *z*, clinopinacoid *b*, orthodome *y* and base *c*..... "
160+ Unit prism *m*, clinopinacoid *b*, orthodome *y*, pyramid *o* and base *c*..... "
161 Unit prism *m*, prism *z*, clinopinacoid *b*, orthodome *y*, pyramid *o* and base *c*..... "
162+ Unit prism *m*, orthodome *x* and base *c*.....VALENCIANITE
163 Unit prism *m*, prism *z*, orthodome *x* and base *c*...ADULARIA
164+ Unit prism *m*, orthopinacoid *a*, clinopinacoid *b*, orthodome *d*, pyramids *p* and *s* and base *c*.....AUGITE
165 Unit prism *m*, orthopinacoid *a*, clinopinacoid *b*, pyramids *p* and *o*..... "
166+ Unit prism *m* and prisms *f* and *x*, orthopinacoid *a*, clinopinacoid *b*, pyramids *p* and *s*, ortho- and clinodomes and base *c*.....DIOPSIDE
167+ Unit prism *m*, orthopinacoid *a*, clinopinacoid *b*, and pyramid *s*.....AUGITE
168+ Unit prism *m*, clinopinacoid *b*, clinodome *r*, orthodome *p* and pyramid .....HORNBLENDE
169+ Unit prism *m*, pyramid *p* and base *c*.....TITANITE
170 " " *m*, orthodome " " *c* ..... "
171+ " pyramids *p* and *d*.....LAZULITE
172+ Pyramid *s* and base *c*.....GLAUBERITE
173 Unit prism *m*, pyramid *n*, orthopinacoid *a*, orthodomes *r* and *i* and base *c*.....EPIDOTE
174 Prism *M* and base *c*.....MUSCOVITE
175+ " *M*, clinopinacoid *b* and base *c*..... "
176 Unit prism *m*, pyramid *h*, orthodomes σ and θ, clinodomes *l* and *p* and base *c*.....AZURITE
177+ Unit prism *m*, orthopinacoid *a*, pyramid *h* and two orthodomes ..... "
178 Unit prism *m*, pyramid, orthodome σ and base *c*.. "
179 Unit prism *m*, clinopinacoid *b*, orthodomes *s* and *t* and base *c*.....HEULANDITE
180 Unit prism *m*, orthopinacoid *a*, orthodome *x*, clinodomes m_x, *g* and *t*, pyramids *n* and ϵ and base *c*.DATOLITE
181 Unit prism *m*, clinodome *e* and pyramid *r*.....GAY-LUSSITE
182 " " *m*, ortho- and clinopinacoids *a* and *b*, pyramids *z* and *o* and base *c*.....BORAX
183 Unit prism *m*, prism *f* and pyramid *t*.....CROCOITE
184+ Long prism striated, clinodomes *z* and *w*, pyramid *t*, orthodome *k* and base *c*..... "
185 Long prism striated and clinodome *z*..... "

186 Unit prism *m* and prism *t*, orthopinacoid *a*, clinodomes κ, α, orthodome and pyramids β and ω . . COLEMANITE
187 Unit prism *m*, prism *t*, orthopinacoid *a*, clinopinacoid *b*, orthodomes *h* and *i*, clinodomes *k* and *a*, pyramids β, *v*, *k*, *y* and *a* and base *c*. . . . . "

Clinohedral Group—Clinohedrite Type.

188 Prism *m*, pyramids *t*, *p*, *z* and *q*. . . . . CLINOHEDRITE

VI. Triclinic System.

Normal Group—Axinite Type.

189+ Unit prisms *M* and *m*, macropinacoid a, macrodome *s* and pyramid *r*. . . . . AXINITE
190 Unit prisms *M* and *m*, macropinacoid *a*, brachyprism *w*, brachydome *y*, pyramids *r* and *n* and base *c*. . . . . "
191 Unit prisms *M* and *m*, brachypinacoid *b*, brachydome *o*, macrodome *x* and base *c*. . . . . PERICLINE
192+ Unit prisms *M* and *m*, macrodome *x* and base *c*. . ALBITE
193+ " " *M* " *m*, brachypinacoid *b*, brachydome *e*, macrodome *y*, pyramid *p* and base *c*. . . . ANORTHITE
194+ Unit prisms *M* and *m*, prisms *z* and *f*, macrodome *x*, brachypinacoid *b* and base *c*. . . . . AMAZONSTONE
195+ Unit prisms *M* and *m*, prisms *z* and *f*, brachypinacoid *b*, macrodome *x*, pyramid *o* and base *c*. "
196 Unit prisms *M* and *m*, prisms *z* and *f*, brachypinacoid *b*, macrodomes *x* and *y* and base *c*. . . . "
197+ Prisms *M* and *m*, macropinacoid *a*, brachypinacoid *b* and pyramid *q*. . . . . CYANITE
198+ Prisms *M* and *m*, brachypinacoid *b*, pyramid *q* and base *c*. . . . . RHODONITE
199 Prisms *M* and *m*, brachypinacoid *b* and pyramid *k*. . . . . "
200+ Prisms *M* and *m*, pyramids *h*, *g*, *f*, *d* and base *c*. . BABINGTONITE

Twins.

I. Isometric System.

201 Octahedrons, contact, tw. pl. parallel to octahedral face . . . . . SPINEL
202+ Cubes, penetration, tw. pl. parallel to octahedral face . . . . . FLUORITE
203+ Pyritohedrons, penetration, tw. axis normal to dodecahedral face. . . . . PYRITE
204 Tetrahedrons, contact, tw. pl. parallel to octahedral face . . . . . SPHALERITE

II. Tetragonal System.

205+ Prismatic, tw. pl. parallel to pyramid *e*. . . . . ZIRCON
206 " " " " " " *e*. . . . . CASSITERITE

207+ Prismatic, tw. pl. parallel to pyramid *e*.....RUTILE
208 Prismatic, tw. pl. parallel to pyramid *e*, repeated twinning ..... "
209+ Prismatic, tw. pl. parallel to pyramid *e*, repeated twinning eightling..... "
210 Tw. pl. parallel to unit pyramid *f*.....CHALCOPYRITE
211 " " " " a pyramid face (trilling)....CUMENGEITE
212 " " " " " " " " (truncated trilling) ..... "

III Hexagonal System.

213 Acute rhombohedrons, penetration. Vertical or *c* axis, the tw. axis.....CINNABAR
214+ Normal rhombohedrons, penetration, tw. axis $\dot{c}$ .CHABAZITE
215+ Scalenohedrons, contact, tw. pl. the base *c*.....CALCITE
216+ " " " " " obtuse rhombohedron *e*..... "
217 Prismatic, contact, tw. pl. the rhombohedron *r*, "Butterfly twin"..... "
218+ Hexagonal type, tw. axis $\dot{c}$.....PHACOLITE
219 " " " " $\dot{c}$, composite penetration twin ..... "
220 Penetration twin, tw. axis $\dot{c}$.....QUARTZ
221 " " " pl. *a* (1120), Brazil Law... "
222+ Contact twin, tw. pl. ϵ, $(11\bar{2}2)$..... "

IV. Orthorhombic System.

223+ Prismatic, pseudo-hexagonal symmetry, tw. pl. prism *m*, about 60°.....ARAGONITE
224 Pyramidal, pseudo-hexagonal symmetry, tw. pl. prism *m*.....WITHERITE
225+ Fiveling law, tw. pl. prism *m*, about 70½°.....MARCASITE
226 Penetration, tw. pl. ρ (031).....CHRYSOBERYL
227 Penetration, tw. pl. parallel to dome *e*.....ARSENOPYRITE
228 Cruciform, tw. pl. brachydome *x*.....STAUROLITE
229+ " " " pyramid *z*..... "
230+ " " " dome *e*.....THENARDITE
231+ Contact, tw. pl. prism *m*, "Spear head" twin.....CERUSSITE
232 " " " " *m*, stellate twin..... "
233 " " " " *m*, reticulated twinning... "

V. Monoclinic System.

234+ Contact, tw. pl. *a*.....AUGITE
235 " " axis $\dot{c}$ (vertical).....LAZULITE
236 " " " $\dot{c}$, Carlsbad twin.....ORTHOCLASE
237+ Penetration, tw. axis $\dot{c}$, Carlsbad twin..... "
238+ Contact, tw. pl. the clinodome *n*, Baveno twin.... "
239 Penetration, tw. pl. the orthopinacoid *a*.....GYPSUM
240+ " " " " " *a*, "Swallow-tail" twin..... "

241 Contact, tw. pl. the orthodome *a*..... TITANITE
242+ Cruciform-penetration, tw. pl. the base *c*..... STILBITE
243+ " " " " " " *c*, simple form ..... PHILLIPSITE
244+ Cruciform-penetration, tw. pl. the base *c*, compounded *e*, then twinned on *m*..... HARMOTOME
245 Cruciform-penetration, tw. pl. the base *c*, united with *e*, then repeated with prism *m*, as the twinning plane..... PHILLIPSITE
246+ Contact tw. pl. normal to *c*..... EUDIDYMITE

VI. Triclinic System.

247+ Albite law, tw. pl. *b*, polysynthetic..... LABRADORITE
248 Pericline law, tw. pl. parallel to *b* axis..... PERICLINE
249+ Polysynthetic, composition face *a*..... CYANITE
250 Manebach law, tw. pl. the base *c*..... AMAZONSTONE

Regular Groupings of Crystals.

251+, 252, 253+ } Parallel growth of crystals of one species { fern, COPPER; rosette, HEMATITE; capped, AMETHYST
254, 255+ } Parallel growth of crystals of two species..... { Staurolite on CYANITE; Chalcopyrite on SPHALERITE

Irregularities of Crystals.

(1) Distortion.

256 Elongated cube..... FLUORITE
257+ Twisted " ..... PYRITE
258 Elongated octahedron..... HALITE
259 Flattened dodecahedron..... GARNET
260 Elongated " ..... COPPER
261+ Flattened cubo-octahedron..... HALITE
262 Elongated " " ..... DYSANALYTE
263 " trapezohedron ..... GARNET
264+ Flattened rhombohedron..... HEMATITE
265+ Abnormal development of one rhombohedron.... QUARTZ
266 " " " opposite rhombohedral faces ..... "
267+ Elongated rhombohedron and flattened prism.... "

(2) Imperfections on the Surfaces of Crystals.

268 Striations due to oscillatory combination, on cube.. PYRITE
269+ " " " " " " prism. QUARTZ
270+ " " " " " " rhomb CALCITE
271 " " " repeated twinning..... MICROCLINE
272+ Markings from erosion, etc., on cube..... GALENA
273 " " " " " pyramid ..... CORUNDUM
274+ " " vicinal prominences..... FLUORITE
275+ " due to oscillatory combination, octahedral, dodecahedral faces..... "

276+ Curved surfaces due to oscillatory combinations, prism and scalenohedron.....CALCITE
277+ Curved surfaces due to independent molecular conditions, rounded.....DOLOMITE
278 Curved surfaces due to independent molecular conditions, sheaf.....STILBITE
279+ Curved surfaces due to mechanical origin, joined..BERYL
280 " " " " " bent...TOURMALINE
281 Hollowed cube, stepped.....HALITE
282+ Cavernous rhombohedron.....QUARTZ

(3) Internal Imperfections and Inclusions.

283+ Enclosing liquid with moving bubble.....QUARTZ
284 Microscopic inclusions.....BERYLLONITE
285+ Enclosing Tourmaline.....QUARTZ
286 " Bitumen ..... "
287 " Sulphur .....GYPSUM
288 Microlites, crystallites, etc.....OLIGOCLASE
289 Symmetrically included Chlorite, "phantom"....QUARTZ
290+ " " carbonaceous impurities.CHIASTOLITE

Pseudomorphs.

(1) By Substitution.

291 Cassiterite replacing.....ORTHOCLASE

(2) By Deposition.

292 Incrustation of Quartz on.....FLUORITE
293+ " " Anglesite on.....CERUSSITE
294 Infiltration .....QUARTZ

(3) By Alteration.

295+ Paramorph of Rutile after.....BROOKITE
296+ Loss of an ingredient by Azurite, forming.....COPPER
297+ Assumption of a foreign substance by Cuprite, forming .....MALACHITE
298+ Partial exchange of constituents of Pyrite, forming .....LIMONITE
299 Partial exchange of constituents of Magnetite, forming .....HEMATITE
300 Partial exchange of constituents of Muscovite, forming .....IOLITE

Elementary.

The following are an improvement on former sets sold at about the same prices. The crystals supplied are all over 1 cm. in length, and many reach 4 cm. Intended for elementary work, they are sufficiently sharp for contact measurement. Many are bright enough for the reflecting goniometer. As far as practicable, simple forms of symmetrical and model-like aspect are chosen.

No. 77A. SCHOOL CRYSTAL SET.

Fifty measurable crystals in cabinet, similar to Plate XII. Following the Elementary List. $15.

No. 79A. SAMPLE CRYSTAL SET.

Twenty-five measurable crystals in cabinet, as shown in Plate XII, $5. Includes those starred (*) in the following list. Merely a few representative examples of simple forms, and intended to show the appearance of natural crystals in a general way, rather than to illustrate even the shortest course. Useful for nature-study classes in primary work.

Elementary Crystal Collection.

ENTIRE LIST FORMS No. 77A. THOSE MARKED * COMPRISE No. 79A.

I. Isometric System.

1* FLUORITE
2 SPINEL
3* GARNET
4 LEUCITE
5* GALENA
6* MAGNETITE
7 GARNET, modified
8 CUPRITE, pseudomorph
9* PYRITE
10* " "
11 " twin

II. Tetragonal System.

12* ZIRCON
13 RUTILE
14* " twin
15 VESUVIANITE
16 APOPHYLLITE
17* WULFENITE
18 CHALCOPYRITE

III. Hexagonal System.

19 BERYL
20 HANKSITE
21* APATITE
22 VANADINITE
23 SIDERITE
24* CALCITE
25 " modified
26 CALCITE, cont'g sand
27 " twin
28* HEMATITE
29* TOURMALINE, black
30 " green
31* QUARTZ

IV. Orthorhombic System.

32* BARITE
33* SULPHUR
34 ANDALUSITE
35 THENARDITE, twin
36* TOPAZ
37 BROOKITE, paramorph
38 STAUROLITE, twin
39* ARAGONITE, "

V. Monoclinic System.

40* GYPSUM
41* ORTHOCLASE
42* " twin
43* PYROXENE
44* AMPHIBOLE
45* TITANITE
46 GLAUBERITE
47 MUSCOVITE

VI. Triclinic System.

48 AXINITE
49* MICROCLINE
50 CYANITE

No. 80A. LECTURE-TABLE CRYSTALS.

Twenty-five measurable crystals, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.). These are greatly limited in number by Nature's supply. Few crystals

occur large enough to be recognized across a room, or even when passed rapidly among a class. We have, however, arranged this incomplete series, embracing merely representative examples of the simpler forms. Some are a little rough in outline, but all are sufficiently well defined to illustrate the form, and are eminently adapted to this purpose. $60. Conveniently kept in an oak wall cabinet, as shown in Plate XIII, $15 extra. According to list.

No. 81A. Lecture-Table Crystals.

Twenty-five measurable crystals, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.). Like above, except in size. $15. List follows. Oak cabinet, $2 extra.

Isometric.

1 FLUORITE
2 FRANKLINITE
3 GARNET
4 SPHALERITE
5 PYRITE

Tetragonal.

6 VESUVIANITE
7 WERNERITE

Hexagonal.

8 BERYL
9 APATITE
10 TOURMALINE
11 QUARTZ
12 CALCITE
13 " twin

Orthorhombic.

14 ANDALUSITE
15 SULPHUR
16 BARITE
17 ENSTATITE

Monoclinic.

18 GYPSUM
19 ORTHOCLASE
20 " twin
21 PYROXENE
22 AMPHIBOLE
23 MUSCOVITE

Triclinic.

24 RHODONITE
25 MICROCLINE

List of Individual Crystals and Index to Complete Crystal List.

NOTE.—As the same form may sometimes be found in a dozen species, the collection which does not duplicate forms, necessarily omits some important minerals.

The following can generally be furnished as individual crystals when desired.

The number or numbers after each name, indicate the position in the Descriptive List of the Complete Crystal Collection.

Prices for selected measurable specimens generally range from $0.10 to $0.75, rarely as much as $1 to $2 each. Large or very rare crystals

PLATE XIII.

GLASS CASE (25 SPECIMENS).

For Lecture-Table-Crystals or Other Short Collections.

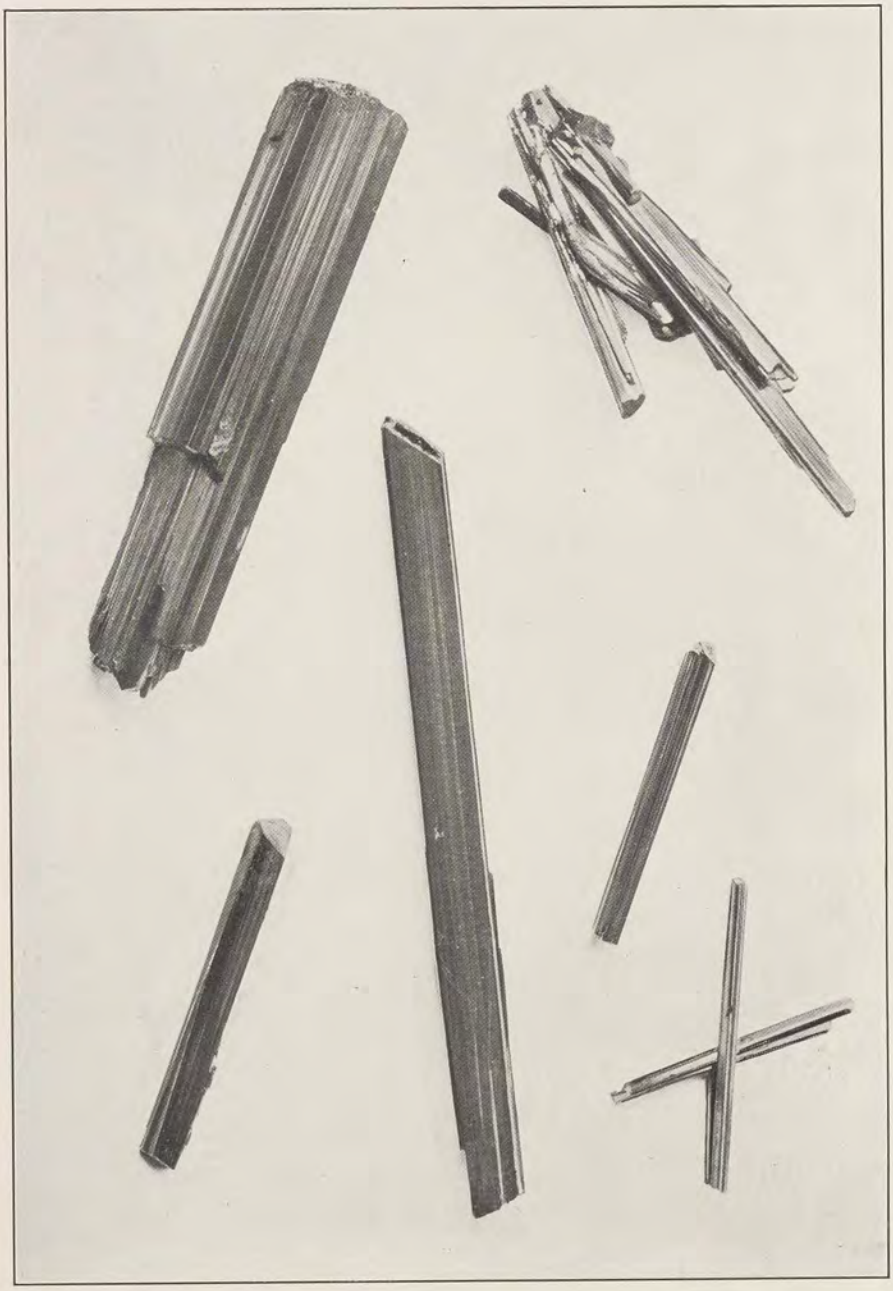


PLATE XIV.

CROCOITE, DUNDAS, TASMANIA.

for cabinet or museum are often more costly. Some common crystals sold by the dozen or hundred of a kind, as low as $0.01 each. Prices and samples to teachers on application.

ACMITE (Ægirite), Mono.
ADULARIA, Mono., 162, 163
ALBITE, Tric., 191, 192
" twin, Tric., 248
ALEXANDRITE, twin, Orth.
AMAZON STONE, Tric., 194, 195, 196
" " twin, 250
AMETHYST, Rhomb., 253
AMPHIBOLE, Mono., 168
ANALCITE, Isom.
ANATASE, Tetr., 54
ANDALUSITE, Orth., 122, 290
ANGLESITE, " 124, 125, 126
ANKERITE, Rhomb.
ANORTHITE, twin, Tric., 193
APATITE, Hex., 68, 70, 71, 72
APOPHYLLITE, Tetr., 51, 52, 53
ARAGONITE, Orth., 141
" twin, 223
ARFVEDSONITE, Mono.
ARGENTITE, Isom.
ARSENOPYRITE, Orth., 119
" twin, 227
AUGITE, Mono., 164, 165, 167
" twin, 234
AXINITE, brown, Tric., 189, 190
AZURITE, Mono., 176, 177, 178
BABINGTONITE, Tric., 200
BARITE, Orth., 108 to 113
BERYL, Hex., 64, 66, 279
BERYLLONITE, Orth., 284
BOLEITE (Percylite), Isom., 35
BORACITE, Isom., 30
BORAX, Mono., 182
BOUGLISITE, Orth., 123
BOURNONITE, twin, Orth.
BROMLITE, Orth.
BROOKITE, " 127, 128, 129
CALAMINE, " 149
CALCITE, Rhomb., 74, 77, 78, 80 to 90
" twin, 215, 216, 217
CASSITERITE, Tetr.
" twin, 206
CATAPLEIITE, Hex. (?)
CELESTITE, Orth., 114
CERUSSITE, " 142
CERUSSITE, twin, 231, 232, 233
CHABAZITE, Rhomb., 76
" twin, 214, 218, 219
CHALCOCITE, Orth.
CHALCOPYRITE, Tetr., 61, 62, 63
" twin, 210
CHESTERLITE, Tric.
CHILDRENITE, Orth., 145
CHONDRODITE, Mono.
CHRYSOBERYL, twin, Orth., 226
CINNABAR, Rhomb., 107
" twin, 213
CLINOHEDRITE, Mono., 188
COBALTITE, Isom.
COLEMANITE, Mono., 186, 187
COLUMBITE, Orth., 146, 147
COPPER, Isom., 251, 260
CORUNDUM, Rhomb., 91, 92, 273
CROCOITE, Mono., 183, 184, 185
CUMENGEITE, Tetr.
" twin, 211, 212
CUPRITE, Isom., 15
CYANITE, Tric., 197
" twin, 249
DANBURITE, Orth.
DATOLITE, Mono., 180
DIAMOND, Isom., 32
DIASPORE, Orth.
DIOPSIDE, Mono., 166
DIOPTASE, Rhomb.
DOLOMITE, " 100, 277
DURANGITE, Mono.
DYSANALYTE, Isom., 36, 38
EMBOLITE, "
ENARGITE, Orth.
ENDLICHITE, Hex.
ENSTATITE, Orth., 148
EPIDIDYMITE, Mono.
EPISTILBITE, "
EPSOMITE, Orth., 153
EUDIALYTE, Rhomb.
EUDIDYMITE, Mono.
" twin, 246
FLUORITE, Isom., 4, 7, 9, 256, 274, 275
" twin, 202
FOWLERITE, Tric., 198

Physical Mineralogy.

Series Illustrating Hardness, Specific Gravity, Color, Effect of Radium on Minerals, etc.

With the exception of crystals, there are no collections prepared by us upon which are bestowed a greater amount of expert labor than in the selection of just the right specimens to illustrate the various physical characters of minerals. This applies to each section but particularly to structure and color. With the loose terminology employed under these headings, the adjectives are sometimes more suggestive than exact. In general the definitions of Dana have been followed. Under color, the terms illustrated are mostly in common use, a large number of less familiar ones being eliminated.

It should be borne in mind that the mere names of minerals opposite the different terms mean much less than the individual character of the specimen chosen. The same species often well represents different characters. As far as possible, however, the duplication of species has been avoided.

Apart from the scarcity of crystal forms, the entire physical series, and notably the color section, makes the most showy and attractive large collection cataloged.

Glass wall case to hold 25 museum specimens, 12 x 9 cm. each ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), costs $15 extra; 60 specimens, $30; 125 specimens, $50. A flat oak case with lid, holding 25 specimens, 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), costs $2 extra; 60 specimens, $3. Drawer cabinet for 125 specimens, 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), $6 extra.

For lists of the following collections, see parts of Complete Physical Series List.

No. 92A. HARDNESS, TENACITY AND FUSIBILITY.

Twenty-five specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $20.

No. 92B. Hardness, Tenacity and Fusibility.

Twenty-five specimens, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $5.

No. 95A. STRUCTURE, CLEAVAGE, TASTE, ETC.

Fifty specimens, averaging 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks, $40.

No. 95B. Structure, Cleavage, Taste, Etc.

Fifty specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $10.

No. 97A. SPECIFIC GRAVITY.

Twenty-five specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $40.

No. 97B. Specific Gravity.

Twenty-five specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $10.

No. 101A. COLOR AND LUSTER.

Seventy-five specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $100.

No. 101B. Color and Luster.

Seventy-five specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $25.

No. 104B. EFFECT OF RADIUM, RÖNTGEN AND ULTRA-VIOLET RAYS, HEAT, FRICTION AND MAGNETISM.

Twenty-five specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $40.

No. 104B. Effect of Radium, Röntgen and Ultra-Violet Rays, Heat, Friction and Magnetism.

Twenty-five specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $10.

No. 111A. COMPLETE PHYSICAL SERIES.

Includes all of the foregoing series as listed. Two hundred specimens, averaging 12 x 9 cm. (4¾ x 3½ in.), with blocks, $240. Glass cases, $75 extra.

No. 111B. Complete Physical Series.

Includes all of the foregoing series as listed. Two hundred specimens, averaging 7 x 5 cm. (2¾ x 2 in.), with trays, $60. Drawer Cabinet, $9 extra.

Complete Physical Series List.

Entire List Constitutes Nos. 111A and 111B.

Hardness, Tenacity and Fusibility.

Nos. 92A and 92B.

Hardness.

1	*H.— 1*	TALC
2	*H.— 2*	GYPSUM
3	*H.— 3*	CALCITE
4	*H.— 4*	FLUORITE
5	*H.— 5*	APATITE
6	*H.— 6*	FELDSPAR
7	*H.— 7*	QUARTZ
8	*H.— 8*	TOPAZ
9	*H.— 9*	CORUNDUM
10	*H.—10*	DIAMOND

Tenacity.

11	*Brittle*	SIDERITE
12	*Tough*	EMERY
13	*Highly sectile.*	CERARGYRITE
14	*Imperfectly "*	ALABASTER
15	*Malleable*	COPPER
16	*Flexible*	ITACOLUMYTE
17	*Elastic*	MUSCOVITE

Fusibility, etc.

18	*F.— 1*	STIBNITE
19	*F.— 2*	NATROLITE
20	*F.— 3*	ALMANDITE
21	*F.— 4*	ACTINOLITE
22	*F.— 5*	ORTHOCLASE
23	*F.— 6*	BRONZITE
24	*Magnetism*	LODESTONE
25	*Streak*	HONESTONE

Structure, Cleavage, Taste, Etc.

Nos. 95A and 95B.

Structure.

26	*Bladed*	CYANITE
27	*Columnar*	GYPSUM
28	*Fibrous*	CHRYSOTILE
29	*Reticulated*	CERUSSITE
30	*Stellated*	PYROPHYLLITE
31	*Radiated*	TOURMALINE
32	*Curved Folia.*	TALC
33	*Straight "*	BIOTITE
34	*Coarse Gran.*	PYROXENE
35	*Fine "*	MARBLE
36	*Compact*	CHALK
37	*Friable*	SINTER
38	*Reniform*	HEMATITE
39	*Mammillary*	CHALCEDONY
40	*Globular*	PISOLITE
41	*Nodular*	MENILITE
42	*Amygdaloidal*	THOMSONITE
43	*Coralloidal*	FLOS FERRI
44	*Dendritic*	COPPER
45	*Mossy*	CALC TUFA
46	*Capillary*	JAMESONITE
47	*Acicular*	ARAGONITE
48	*Drusy*	QUARTZ
49	*Stalactitic*	STALACTITE
50	*Amorphous*	DEWEYLITE

Cleavage.

51	*Cubic*	GALENA
52	*Octahedral*	FLUORITE
53	*Dodecahedral*	SPHALERITE
54	*Basal*	MUSCOVITE
55	*Prismatic*	AMPHIBOLE
56	*Rhombohedral*	CALCITE
57	*Pinacoidal*	GYPSUM

Fracture.

58	*Conchoidal*	SMOKY QUARTZ
59	*Even*	LITHOGR. ST'N.
60	*Uneven*	RHODONITE
61	*Hackly*	FRANKLINITE
62	*Earthy*	TRIPOLI
63	*Splintery*	PECTOLITE

Taste.

64	*Astringent*	MELANTERITE
65	*Saline*	HALITE
66	*Alkaline*	NATRON
67	*Bitter*	KAINITE
68	*Sour*	COQUIMBITE

Odor.

69	*Alliaceous*	ARSENOPYRITE
70	*Sulphurous*	PYRITE
71	*Bituminous*	ELATERITE

72 *Fetid* ..... BARITE
73 *Argillaceous* .. KAOLIN

Touch.

74 *Greasy* ..... GRAPHITE
75 *Tongue Adheres* . ALLOPHANE

Specific Gravity.

Nos. 97A and 97B.

(The figures given are approximate.)

Unmetallic Luster.

76 *G.— 1.* ..... COPALITE
77 *G.— 1.6*.....ULEXITE
78 *G.— 1.9*..... THAUMASITE
79 *G.— 2.1*.....OPAL
80 *G.— 2.3*.....GYPSUM
81 *G.— 2.6*.....ALBITE
82 *G.— 2.8*.....PROCHLORITE
83 *G.— 3.* .....CRYOLITE
84 *G.— 3.2*..... ANDALUSITE
85 *G.— 3.5*.....TITANITE
86 *G.— 3.7*..... STRONTIANITE
87 *G.— 4.* ..... SPHALERITE
88 *G.— 4.3*.....WITHERITE
89 *G.— 4.7*..... ZIRCON

Metallic Luster.

90 *G.— 5.* ..... PYRITE
91 *G.— 5.7*.....ARSENIC
92 *G.— 6.* ..... ARSENOPYRITE
93 *G.— 6.2*.....ALLEMONITE
94 *G.— 6.7*.....CASSITERITE
95 *G.— 7.5*.....GALENA
96 *G.— 8.* .....CINNABAR
97 *G.— 8.9*.....COPPER
98 *G.— 9.8*.....BISMUTH
99 *G.—13.6*.....MERCURY
100 *G.—18.* .....GOLD

Color and Luster.

Nos. 101A and 101B.

Color.

Metallic Colors.

101 *Tin-White* ... LOLLINGITE
102 *Lead-Gray* ... MOLYBDENITE
103 *Brass-Yellow* . CHALCOPYRITE
104 *Copper-Red* .. COPPER
105 *Bronze-Yellow* PYRRHOTITE

Non-Metallic Colors.

White.

106 *Snow-White* .. MAGNESITE
107 *Milk-White* ... QUARTZ
108 *Greenish-White* TALC
109 *Yellowish-White* . STALACTITE
110 *Reddish-White* APOPHYLLITE
111 *Grayish-White* LIMESTONE

Gray.

112 *Yellowish-Gray* BUHRSTONE
113 *Ash-Gray* .... ZOISITE
114 *Greenish-Gray* BYSSOLITE
115 *Bluish-Gray* .. ANHYDRITE

Black

116 *Grayish-Black*. ILMENITE
117 *Bluish-Black* . CHALCOPHAN
118 *Greenish-Black* HORNBLENDE
119 *Brownish-Black* CANNEL COAL
120 *Velvet-Black* .. UINTAHITE

Blue.

121 *Lavender-Blue* LEPIDOLITE
122 *Violet-Blue* .. VIOLAN
123 *Greenish-Blue* AURICHALCITE
124 *Azure-Blue* ... LAZURITE
125 *Prussian-Blue* . AZURITE
126 *Indigo-Blue* .. COVELLITE
127 *Sky-Blue* ..... CELESTITE

Green.

128 *Apple-Green* .. WILLEMITE
129 *Olive-Green* .. OLIVINE
130 *Leek-Green* ... VERD ANTIQUE
131 *Emerald-Green* FLUORITE
132 *Grass-Green* .. MALACHITE
133 *Verdigris-Gr'n*. AMAZONSTONE
134 *Pistachio-Gr'n*. EPIDOTE

Yellow.

135 *Sulphur-Yellow* SULPHUR
136 *Honey-Yellow* CALCITE
137 *Lemon-Yellow* WULFENITE
138 *Ochre-Yellow* . OCHRE
139 *Orange-Yellow* ECDEMITE

Red.

140 *Rose-Red* ..... ROSE QUARTZ
141 *Flesh-Red* .... CHABAZITE

142 *Blood-Red* .... ZINCITE
143 *Scarlet-Red* ... CROCOITE
144 *Brick-Red* .... SEMI-OPAL
145 *Crimson-Red* . CINNABAR
146 *Garnet-Red* ... ALMANDITE

Brown.

147 *Yellowish-Br'n*. WOOD-OPAL
148 *Chestnut-Br'n*. GROSSULAR
149 *Clove-Brown* .. LIMONITE
150 *Reddish-Brown* JASP. WOOD

Luster.

Kinds of Luster.

151 *Metallic* ..... JAMESONITE
152 *Adamantine* .. ENDLICHITE
153 *Vitreous* ..... HYALITE
154 *Resinous* ..... SPHALERITE
155 *Greasy* ..... ELÆOLITE
156 *Pearly* ..... DOLOMITE
157 *Silky* ..... SATIN SPAR

Degrees of Luster.

158 *Splendent* .... HEMATITE
159 *Shining* ..... DOLOMITE
160 *Glistening* ... PAPIERSPATH
161 *Glimmering* .. FLINT

Luster Phenomena.

162 *Play of Colors* OPAL
163 *Change of* " LABRADORITE
164 *Opalescence* .. MOONSTONE
165 *Chatoyancy* ... TIGER EYE
166 *Iridescence* ... COAL
167 *Dichroism* .... EPIDOTE
168 *Tarnish* ..... BORNITE
169 *Asterism* ..... PHLOGOPITE
170 *Schiller* ..... SUNSTONE

Diaphaneity.

171 *Transparent* .. ROCK CRYSTAL
172 *Semi-* " .. FLUORITE
173 *Translucent* .. ALBITE
174 *Semi-* " .. MEX. ONYX
175 *D'ble Refract'n* ICELAND SPAR

Effect of Radium, Röntgen and Ultra-Violet Rays, Heat, Friction and Magnetism.

(NOTE.—The first half of this list is subject to revision.)
Nos. 104A and 104B.

Radium.

176 *Phosphorescent* DIAMOND
177 *Fluorescent* ...WILLEMITE

Röntgen Rays.

178 *Fluorescent* ...FLUORITE
179 *Phosphorescent* ARAGONITE
180 *Opaque* ..... SULPHUR
181 *Transparent* ..GRAPHITE

Ultra-Violet Rays.

182 *Fluorescent red.* CALCITE
183 " *Blue*. HYDROZINCITE
184 " *Green* HYALITE
185 *Phosphor., Blue* COLEMANITE
186 " *Green*...SELENITE
187 *Opaque* ..... MICA

Heat.

188 *Pyro - Electric, Terminal Polarity.* TOURMALINE
189 *Pyro - Electric, Lateral Polarity* ..RUTILE, tetr.
190 *Pyro - Electric, Lateral Polarity* ..QUARTZ, hex.
191 *Thermo-Elect*..PYRITE
192 *Phosphor. Blue* CHLOROPHANE
193 " *Red.* LEPIDOLITE

Friction.

194 — *Electricity*. AMBER
195 + " QUARTZ
196 *Triboluminescent, Red*.....HEXAGONITE
197 *Triboluminescent, Yellow*.....SPHALERITE

Magnetism.

198 *Polarity* ..... LODESTONE
199 *Strongly Magn'c* PYRRHOTITE
200 *Weakly* " GARNET

Chemical Mineralogy.

Specimens for Blowpipe and Wet Analysis.

(See "Laboratory List" beyond for prices of minerals sold by weight.)

The material selected for these collections is as near chemically pure as the minerals generally occur in nature. All are clean, typical examples of distinct species. The list includes those commonly covered in an elementary course, as recommended by von Kobell, Brush, Dana and others.

No. 119A. BLOWPIPE COLLECTION.

One hundred specimens of pure minerals as listed. Average size, 12 x 9 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ in.), with blocks (bottles or wooden boxes substituted without charge), $100. Each specimen, averaging 600 cu. cm. volume, may be broken into fragments, affording material for over 500 analyses. Glass case, $50 extra.

No. 119B. Blowpipe Collection.

One hundred specimens of pure minerals, averaging 7 x 5 cm. ($2\frac{3}{4}$ x 2 in.), with trays, $25. Each specimen will afford material for over 100 analyses. Drawer cabinet, $6 extra. According to following list:

Blowpipe Collection List.

Arsenic.

1 REALGAR
2 ORPIMENT

Antimony.

3 STIBNITE

Molybdenum.

4 MOLYBDENITE

Gold and Tellurium.

5 SYLVANITE

Mercury.

6 CINNABAR

Copper.

7 CHALCOCITE
8 BORNITE
9 CHALCOPYRITE
10 TETRAHEDRITE
11 ENARGITE
12 CUPRITE
13 MALACHITE
14 AZURITE
15 ATACAMITE
16 CHRYSOCOLLA

Lead.

17 GALENA
18 JAMESONITE
19 PYROMORPHITE
20 VANADINITE
21 CERUSSITE
22 WULFENITE
23 ANGLESITE
24 CROCOITE

Tin.

25 CASSITERITE
26 STANNITE

Titanium.

27 RUTILE
28 ILMENITE

Iron.

29 PYRITE
30 ARSENOPYRITE
31 HEMATITE
32 MAGNETITE
33 FRANKLINITE
34 CHROMITE
35 LIMONITE
36 SIDERITE
37 VIVIANITE

Nickel.

38 MILLERITE
39 NICCOLITE
40 PYRRHOTITE

Cobalt.

41 SMALTITE
42 COBALTITE
43 ASBOLITE

Manganese.

44 PYROLUSITE
45 PSILOMELANE
46 RHODOCHROSITE
47 RHODONITE
48 MANGANITE
49 ALABANDITE

Zinc.

50 SPHALERITE
51 ZINCITE
52 CALAMINE
53 SMITHSONITE
54 WILLEMITE
55 HYDROZINCITE

Aluminum.

56 CORUNDUM
57 BAUXITE
58 CRYOLITE
59 WAVELLITE
60 KAOLIN
61 ALUNITE
62 PYROPHYLLITE

Calcium.

63 FLUORITE
64 CALCITE
65 APATITE
66 ANHYDRITE
67 GYPSUM
68 COLEMANITE

Magnesium.

69 BRUCITE
70 MAGNESITE
71 DOLOMITE
72 KIESERITE

Barium.

73 BARITE
74 WITHERITE

Strontium.

75 STRONTIANITE
76 CELESTITE

Lithium.

77 LEPIDOLITE
78 AMBLYGONITE

Sodium and Potassium.

79 BORAX
80 CARNALLITE

Silicates.

81 ORTHOCLASE
82 PYROXENE
83 WOLLASTONITE
84 AMPHIBOLE, Actinolite
85 GARNET, Almandite
86 CLINOCHLORE
87 EPIDOTE
88 TOURMALINE
89 TOPAZ
90 TALC
91 SERPENTINE
92 DATOLITE
93 APOPHYLLITE
94 PECTOLITE
95 NATROLITE
96 STILBITE

Uranium.

97 URANINITE
98 CARNOTITE

Tungsten.

99 WOLFRAMITE
100 SCHEELITE

Laboratory List.

Pure Minerals Sold by Weight for Analysis and Experiment.

Many minerals can be supplied which are not here listed. Prices are for sample lots and rarely indicate commercial values. Material is usually furnished in several irregular pieces, specimens of uniform size costing more. Where more than 5 per cent. of gangue is attached the approximate percentage of pure mineral is noted. *This is the only list published which thus guarantees quality.* A minimum price of $0.20 is charged for any mineral sold by weight.

The following rates hold for quantities up to ten kilos. Larger quantities at lower rates. Smaller quantities than one kilo are charged at a rate 25 per cent. higher, proportionately, than the kilo price. (Thus Alabandite $2 per kilo is $1.25 per half-kilo.) Ores of the Rare Elements are listed separately. Prices will be furnished when quantities desired are stated.

Comparison of Weights.

1000 grams	=	1 kilogram (K.)	= about	$2\frac{1}{5}$	pounds.
100 "	=	1 hectogram (H.)	= "	$3\frac{1}{2}$	ounces.
10 "	=	1 dekagram (D.)	= "	$\frac{1}{3}$	ounce.
		1 gram (G.)	= "	$15\frac{1}{2}$	grains.

	Per kilo. (2.2 lbs.)
Actinolite	$0.40
Agate, banded or moss	.50
Alabandite	2.00
Alabaster	.20
Albite	.20
Allemontite	1.50
Allophane	1.00
Almandite	.60
Alunite	.30
Alunogen	1.00
Amazon Stone, cryst'd	.40
Amber	4.00
Amblygonite	.70
Amethyst	1.00
Amphibole, Actinolite	.40
Amphibole, Asbestus, gray	$0.40
" Byssolite	1.00
" Edenite	.20
" Hexagonite	.60
" Hornblende	.20
" Tremolite	.60
Analcite, cryst'd	4.00
Andalusite	1.50
Anglesite	2.00
Anhydrite	.20
Anthophyllite	.40
Anthracite	.20
Antimony	3.00
Apatite, brown, crystals	.40
" white, massive	.20

	Per kilo (2.2 lbs.)
Apatite, Phosphate rock	$0.20
Apophyllite	2.50
Aquamarine (per D., $0.20)	
Aragonite	.30
Argentite (per D., $0.30)	
Arkansite, paramorph	1.50
Arsenic	1.80
Arsenopyrite	.20
Asbestus, Amphibole, gray	.40
" " white	1.00
" Chrysotile	1.00
Asbolite	1.00
Asphaltum	.20
Atacamite	4.00
Augite, crystals	1.00
Aventurine Feldspar—see Sunstone.	
Axinite, yellow or brown	1.00
Azurite	1.00
Barite	.20
Bauxite	.20
Beryl, green or yellow	.40
" Aquamarine (per D.,$0.20)	
Biotite	.40
Bismuth	6.00
Bismuthinite	6.00
Bituminous Coal	.20
Blende	.20
Boleite, cry'ls (per D., $0.90)	
Boracite	.50
Borax	.50
Bornite, argentif.	1.50
Boulangerite	1.50
Bournonite	6.00
Braunite	.50
Bronzite	.40
Brookite, paramorph	1.50
Brown Coal	.20
Brucite	2.00
Byssolite	1.00
Calamine	.40
Calcite, cleavage	.20
" crystals	.40
" Chalk	.20
" Iceland Spar, good	2.00
" " " clear	4.00
" Limestone	.20
" Marble	.20
" Mexican Onyx	.30
" siliceous, crystals	.40

	Per kilo. (2.2 lbs.)
Calc Spar	$0.20
Calc Tufa	.20
Cancrinite	4.00
Cannel Coal	.20
Carnallite	.30
Cassiterite, massive	.60
" Stream Tin	.60
Caswellite	1.00
Celestite, cleavage	.20
Cerargyrite (per D., $0.30)	
Cerussite, gray, mass	.80
" white, cryst'd	1.60
Cervantite	.50
Chabazite	2.00
Chalcedony	.50
Chalcocite	.70
Chalcophanite	1.00
Chalcopyrite	.40
Chalk	.20
Chloanthite	2.00
Chlorite	.40
Choritoid, var. Masonite	.30
Chlorophyllite	.30
Chromite	.20
Chrysocolla	1.00
Chrysolite	.30
Chrysotile, Asbestus	1.00
Cinnabar	2.00
Cinnamon Stone	.60
Cleavelandite	.20
Clinochlore	1.00
Coal, Anthracite	.20
" Bituminous	.20
" Brown	.20
" Cannel	.20
Cobaltite	2.50
Coccolite	.20
Colemanite	.50
Copalite	2.50
Copper, native	.60
" glance	.70
" Pyrites	.40
Cordierite	3.00
Corundum, sharp cleavages or rough crystals	1.00
Corundum, Sapphire (per D., $2.00)	
Corundum, Ruby (per D., $2.00)	
Corundum, Emery	.20

	Per kilo. (2.2 lbs.)
Covellite	$2.00
Crocidolite, unaltered	1.00
" altered to Quartz.	.50
Crocoite, crystals	3.00
Cryolite	.40
Cuprite	1.50
Cyanite	.30
" transparent crystals (per D., $0.30)	
Cylindrite	3.00
Datolite	2.00
Dendritic Agate	.50
Deweylite	1.00
Diaspore	2.00
Dolomite	.20
Domeykite Stibio-domeykite	4.00
Dufrenite	1.00
Dyscrasite (per D., $0.70)	
Edenite	.20
Elæolite	.50
Elaterite	1.00
Embolite (per D., $0.30)	
Emery	.20
Enargite	1.00
Enstatite	.30
Epidote	.50
Feldspar, Potash—see Orthoclase.	
Feldspar, Soda—see Albite.	
Fibrolite	.40
Fire Opal	9.00
Flexible Sandstone	.20
Fluorite, white granular	.20
" pink, green or blue translucent cleavages	.60
Fowlerite	.40
Franklinite	.40
Galena, cleavable	.30
" argentiferous	.50
Garnet	.60
Garnierite	1.50
Gilsonite	.20
Gold Quartz (Rand cong.)	.50
Gold Ore (Telluride)	1.00
Goslarite	2.00
Göthite	.60
Graphite	.50
Gray Copper, argentif.	1.00
Griphite	1.00
Grossularite	.60
Gypsum, granular	$0.20
" coarsely fibrous	.20
" Alabaster, best white	.20
" Satin Spar	.50
" Selenite, clear colorless cleavage	.30
Halite, granular	.20
" transparent	.40
Halloysite	1.00
Halotrichite	2.00
Hardystonite	.60
Hausmannite	.30
Heavy Spar	.20
Heliotrope	2.00
Hematite, compact	.20
" cryst'd	.40
" micaceous	.20
" oölitic	.20
" Pencil Ore	.70
Heulandite	3.00
Hexagonite	.60
Hornblende	.20
Horn Silver (per D., $0.30)	
Iceland Spar, good	2.00
" " colorless	4.00
Idocrase	.50
Infusorial Earth	.20
Iolite, Cordierite	3.00
" Chlorophyllite	.30
Iridosmine (per D., $9.00)	
Iron, meteoric, shavings	1.00
" terrestrial, fragments	2.00
" Pyrites	.20
Itacolumyte	.20
Jade (Nephrite)	4.00
Jamesonite	1.50
Jasper	.60
Jasperized Wood	.30
Jefferisite	.60
Jeffersonite	.40
Kainite	.30
Kaolinite	.20
Kieserite	.30
Labradorite, chatoyant	.60
" ordinary	.30
Lapis Lazuli	5.00
Lazurite	5.00
Lepidolite	.20
Lignite	.20
Limestone	.20

	Per kilo. (2.2 lbs.)
Limonite, various	$0.20
" Yellow Ochre	.20
Lithiophilite	.50
Lodestone, ordinary	.50
" extra strong	1.50
Ludwigite	1.00
Magnesite	.20
Magnetite—see Lodestone	.20
Malachite	1.00
Manganite	.40
Marble	.20
Marcasite	1.00
Martite, cryst'd	1.00
Masonite	.30
Massicot (per D., $0.30)	
Meerschaum	2.00
Melanterite	1.20
Menilite	.40
Mexican Onyx	.30
Mica, various	.40
Micaceous Hematite	.20
Microcline, Amazon Stone	.40
Milky Quartz	.20
Millerite	2.50
Mispickel	.20
Moss Agate (dendritic)	.50
Muscovite	.40
Nadorite	4.00
Natrolite	4.00
Nephelite, Elæolite	.50
Nephrite, Jade	4.00
Newberyite (per D., $0.20)	
Niccolite	2.50
Niter, Soda	.20
Ochre, yellow	.20
Oligoclase	2.00
Olivine, Chrysolite	.30
Onyx, Mexican	.30
Opal, Fire	9.00
" Precious (according to variety of colors. Per D., $0.20 to $1.00)	
Opal, Semi (common)	.50
" Tripoli	.20
" Menilite	.40
" Wood	.50
Orpiment	2.00
Orthoclase, Common Feldspar	.20
Osmiridium (per D., $9.00)	
Ozocerite	.40
Pectolite	$1.00
Perthite, Sunstone	.40
Petalite	1.00
Petrified Wood	.30
Petroleum	.20
Phlogopite	.40
Phosphate Rock	.20
Piedmontite	1.00
Pisolite	.70
Platinum (per D., $9.00)	
Plumbago	.50
Polyhalite	.40
Prehnite	.80
Prochlorite	.40
Proustite (per D., $0.60)	
Psilomelane	.20
Pyrargyrite (per D., $0.60)	
Pyrite	.20
Pyrolusite	.20
Pyromorphite, cryst'ne	3.00
Pyrophyllite	1.00
Pyroxene, Augite crystals	1.00
" Coccolite	.20
" Jeffersonite	.40
Pyrrhotite	.20
Quartz, Agate	.50
" Amethyst	1.00
" auriferous conglom.	.50
" Chalcedony	.50
" Flexible Sandstone	.20
" Flint	.20
" Jasper	.60
" Jasperized Wood	.30
" Milky	.20
" Moss Agate, dendritic	.50
" Rock Crystal	1.50
" Rose—see Rose Quartz.	
" Smoky	.20
Realgar	2.00
Rhodochrosite	1.00
Rhodonite	.40
Ripidolite	1.00
Rock Crystal, transparent	1.50
Rose Quartz, pale pink	.40
" " deep "	1.00
Rubellite, crystals	2.00
Ruby (per D., $2.00)	
Ruby Silver (per D., $0.60)	
Salt, Rock—see Halite.	
Sandstone, Flexible	.20

	Per kilo. (2.2 lbs.)
Sapphire (per D., $2.00)	
Satin Spar	$0.50
Scapolite	.60
Selenite, clear cleavages	.30
Sepiolite, Meerschaum	2.00
Serpentine, common	.20
" Chrysotile, Asbestus	1.00
" Williamsite	.40
" Verde Antique	.40
Siderite	.20
Siliceous Calcite	.40
Sillimanite	.40
Silver-bearing Quartz	.50
Smaltite	2.50
Smithsonite	.50
Smoky Quartz	.20
Soapstone	.20
Sodalite	1.00
Soda Niter	.20
Sperrylite (per D., $9.00)	
Sphalerite, cleavable	.20
" fibrous	.20
" white granular	.40
Spodumene	.40
Stannite	1.50
Staurolite	2.00
Steatite	.20
Stephanite (per D., $0.70)	
Stibio-domeykite	4.00
Stibnite	.40
Stilbite	.70
Stream Tin	.60
Strontianite	.20
Succinite	4.00
Sulphur	.40
Sunstone, Perthite	.40
Sylvite	$0.50
Talc, foliated	.30
" Steatite	.20
Tasmanite	1.00
Tetradymite (per D., $0.30)	
Tetrahedrite, argentif.	1.00
Thaumasite	.50
Tiger Eye	.50
Topaz	.50
Tourmaline, black	.40
" brown	.60
" green, crystals	6.00
" Rubellite, "	2.00
Tremolite	.60
Triphylite	1.20
Triplite	3.00
Tripolite	.20
Uintahite	.20
Ullmannite	1.50
Verde Antique	.40
Vesuvianite	.50
Vivianite	6.00
Wad	.20
" Asbolite	1.00
Wavellite	1.00
Wernerite, lilac	.60
Willemite	.50
Williamsite	.40
Witherite	.20
Wollastonite	.40
Yellow Ochre	.20
Zinc Blende	.20
Zincite	1.00
" with Franklinite, etc.	.60
Zoisite	.80

Rare Metal Minerals.

The increasing commercial importance of the rare elements and the active demand for them among experimenters and electro-chemists has led to wide fluctuations in value. Their ores are therefore excluded from the general laboratory price list. The following are the most important in stock although some others are occasionally procurable. Prices will be furnished to those stating quantities desired. Large or small lots supplied.

Æschynite
Allanite
Argyrodite
Autunite
Bastnasite
Beryl
Beryllonite
Brookite
Carnotite
Cerite
Cleveite
Columbite
Cyrtolite
Descloizite
Dysanalyte, crystals
Endlichite
Euxenite
Fergusonite
Gadolinite
Gummite
Hielmite
Hubnerite
Ilmenite
Keilhauite
Microlite
Molybdenite
Monazite, crystals
Monazite Sand
Orangite
Pollucite
Rutile, ordinary red or black (2% to 3% iron)
Rutile, best red
Samarskite
Scheelite
Tantalite
Thorite
Titanite
Torbernite
Uraninite
Uranophane
Vanadinite
Wolframite
Wulfenite
Xenotime
Yttrotantalite
Zircon

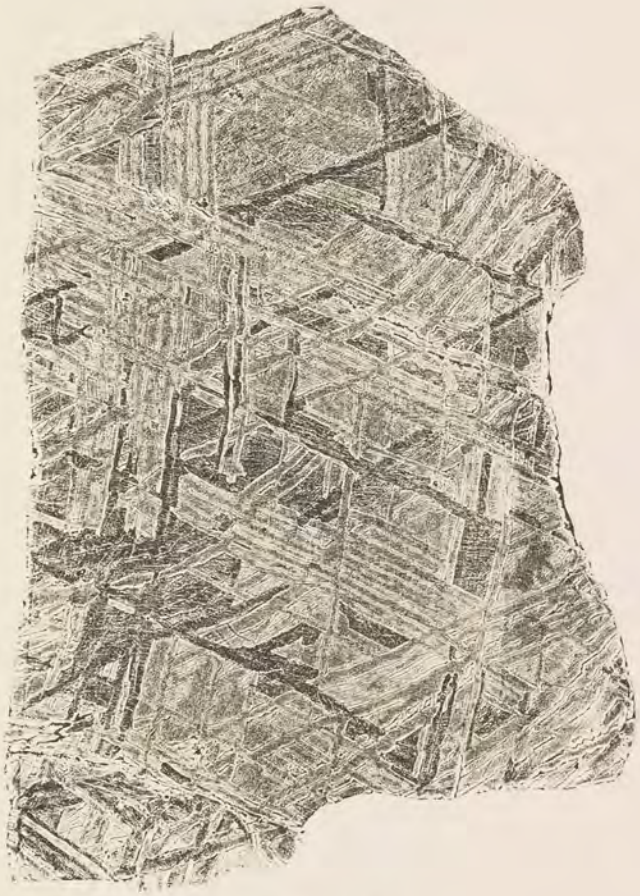


PLATE XV.

THE SACRAMENTO MOUNTAINS METEORITE.

The above Print was made direct from a Polished Slab, etched with Acid to show Crystalline Structure, or "Widmannstatten Figures."

Price List of Individual Specimens

OF THE

Commoner Minerals, Including the Kinds Used in Elementary Study.

(NOTE.—An extensive price list of individual specimens is given in the Complete Mineral Catalog.)

STUDENT'S SIZE SPECIMENS furnished at list prices.

MUSEUM SIZE SPECIMENS cost quadruple the list price.

INTERMEDIATE SIZES cost in proportion to volume.

SMALLER SIZES cost the same as the student's size, except in stated quantities of ten or more of one kind, when lower prices can be quoted on request.

Those who already possess a partial collection, or who for other reasons do not care for one of our regular collections, will find the following list useful in ordering. Specimens purchased in this way cost more than if bought in a cataloged collection, as the latter are economically prepared, a number at a time, thus saving about 15 per cent.

Unless otherwise noted the specimens are usually pure, massive and about 7 x 5 x 4 cm. ($2\frac{3}{4}$ x 2 x $1\frac{1}{2}$ in.), the standard Student's Size. The standard Museum or Exhibition Size, 12 x 9 x 7 cm. ($4\frac{3}{4}$ x $3\frac{1}{2}$ x $2\frac{3}{4}$ in.), has about five times the volume of the Student's Size and costs four times as much as the list price.

The names in italics are those comprising the Normal or High School Collection. In general, they are the most important in the list for the average course in Elementary Mineralogy.

UNDERSIZED SPECIMENS are generally marked by a cross (+).

THE APPROXIMATE PER CENT. (%) of massive mineral (not metal) in matrix is generally marked after such as are mixed with associated mineral or gangue rock. According as the stock varies from time to time, undersized pure specimens are substituted for those listed as standard size impure.

CRYSTALLIZED SPECIMENS, marked "cryst'd," are in groups, often with gangue. Those marked "crystal" or "crystals" are loose. For complete list of crystals, see section on Crystallography.

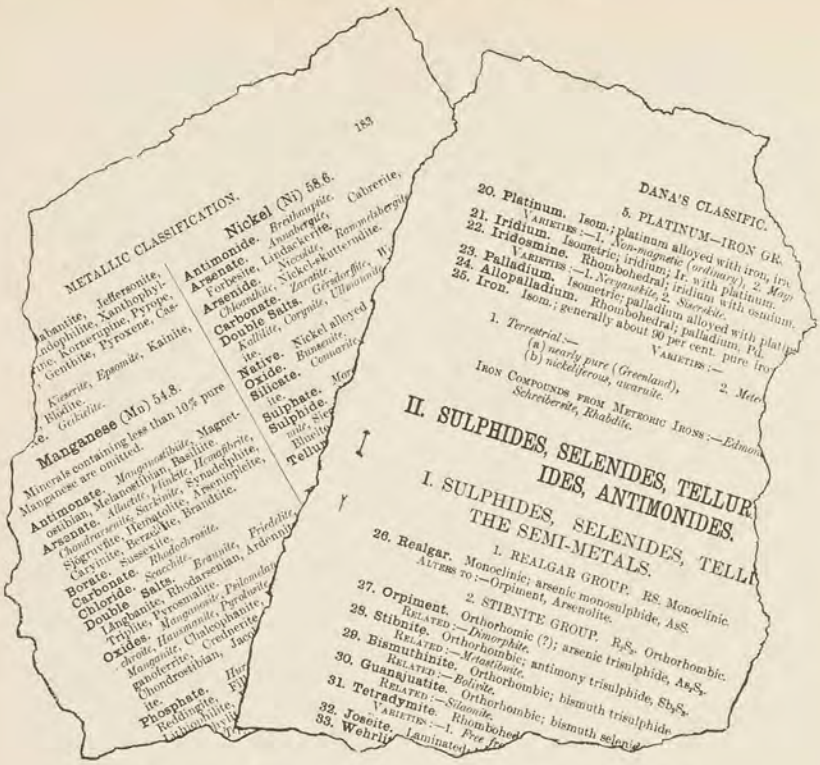
These prices are often only approximate, but will average right if a number of specimens are purchased.

Actinolite, cryst'd	$0.15
Alabaster	.10
Albite, Cleavelandite, cryst'ne.	.10
Albite, Moonstone, "	.20
Albite, Pericline, cryst'd	.40
Allophane	.25
Alunite	.10
Alunogen	.15
Amblygonite	.20
Amphibole, Actinolite, cr'd.	.15
Amphibole, Asbestus	.15
+*Amphibole, Hornblende,* cr'd.	.30
Amphibole, " massive.	.10
Amphibole, Tremolite, cr'd.	.20
Analcite, cryst'd	.40
Andalusite, "	.20
+*Anglesite,* cryst'd	.50
Anhydrite	.10
Anorthite, 25%	.30
+Anorthite, crystal	.50
Anthracite Coal	.10
+*Antimony,* cryst'ne	.40
Apatite, crystal	.20
Apatite, massive	.15
" Phosphate Rock	.10
Apophyllite, cryst'd	.40
+*Aragonite,* crystals	.30
Aragonite, Flos-ferri	.20
+*Argentite,* 25%	.40
Arsenic, 25%	.40
Arsenopyrite	.10
Asbestus—see Amphibole and Serpentine.	
Asphaltum	.10
Atacamite, cryst'd	.30
Augite—see Pyroxene.	
Autunite, cryst'd	.50
Azurite, "	.50
Azurite, massive	.30
+*Barite,* crystal, blue	.30
Barite, cryst'd, yellow	.30
" cryst'ne	.10
Bauxite	.10
Beryl, crystal	.30
Beryl, massive	.10
Biotite, sheet	.10
Bismuth, 10%	.50
Bismuthinite, 15%	.50
Bituminous Coal	.10
Blende—see Sphalerite.	
Boracite	.20
+*Borax,* crystal	$0.20
Bornite, 25%	.30
Bournonite, cryst'd	.50
Braunite	.35
Brookite, Arkansite, cryst'd.	.40
Brucite, cleavage	.30
Calamine, cryst'd	.25
Calcite, " hexagonal	.50
Calcite, " yellow	.15
Calcite, Calc Tufa	.10
Calcite, Chalk	.10
Calcite, Hydraulic Limestone.	.10
Calcite, Iceland Spar	.30
Calcite, Lithographic Stone.	.10
Calcite, Marble, pol.	.20
Calcite, Mexican Onyx, pol.	.30
Calcite, Papierspath	.50
Calcite, Stalactite	.20
Cannel Coal	.10
Carnallite	.15
Cassiterite, cryst'd	.50
Cassiterite, disseminated 10%	.10
Cassiterite, Stream Tin	.25
Celestite, cryst'd	.50
Celestite, massive	.10
Cerargyrite, 5%	.40
Cerussite, cryst'd	.50
Cerussite, massive	.30
Chabazite, cryst'd	.25
Chalcocite	.30
Chalcopyrite, cryst'd	.20
Chalcopyrite, massive	.20
Chromite	.10
Chrysocolla	.25
Chrysolite, Olivine	.10
Cinnabar, 25%	.40
Clinochlore	.20
Coal, various	.10
Cobaltite, cryst'd, 25%	.30
Colemanite, "	.50
Columbite, "	.30
Copalite	.20
Copper, disseminated, in conglomerate, 20%	.10
Copper Pyrites—see Chalcopyrite.	
Corundum, cryst'd	.20
Corundum, Emery	.10
Crocoite, cryst'd	.50
Cryolite	.15
Cuprite, cryst'd	.50

Cuprite, Chalcotrichite $0.30
" massive, 25% ..... .20
Cyanite, cryst'ne ..... .20
Datolite, cryst'd ..... .20
+*Diamond,* crystal ..... .50
+*Dioptase* ..... .50
Dolomite, Pearl Spar, cryst'd. .15
Dolomite, massive ..... .10
Elæolite ..... .15
+Embolite, cryst'd ..... .50
Enargite ..... .50
Endlichite, cryst'd ..... .30
Enstatite, Bronzite ..... .15
Epidote, cryst'd ..... .20
+*Erythrite,* " ..... .50
Flos-ferri ..... .20
Fluorite, cryst'd ..... .20
Fluorite, green cleavage..... .30
Fluorite, white, massive..... .10
Fowlerite, cryst'ne ..... .30
Franklinite, cryst'd ..... .50
Franklinite, granular ..... .20
Galena, cryst'd ..... .35
Galena, cleavage ..... .25
Galena, argentif. ..... .50
Garnet, Almandite, cryst'd .. .20
Garnet, Grossularite, " .. .20
Garnierite ..... .30
Genthite, 5% ..... .20
Gold, disseminated grains.... .50
Gold, disseminated microscopically, Transvaal ore, ¾ oz. Au to ton ..... .20
+Gold, dust ..... .50
Göthite, cryst'ne ..... .25
Graphite ..... .15
Gypsum, Alabaster ..... .10
Gypsum, Satin Spar ..... .20
Gypsum, Selenite, cleavage.. .10
Gypsum, Selenite, crystal ... .20
Halite, transp., cleavage..... .10
Halite, granular ..... .10
Halloysite ..... .30
Hematite, cryst'd ..... .30
Hematite, massive ..... .10
Hematite, Pencil Ore ..... .30
Heulandite, cryst'd ..... .30
Hornblende—see Amphibole.
Iceland Spar ..... .30
Ilmenite ..... .10
+*Iron,* meteoric, etched..... .20

Jamesonite, 33% $0.30
Kaolinite ..... .10
Labradorite, chatoyant ..... .15
Lead, native, coating..... .20
Lepidolite ..... .10
Limonite ..... .10
Limonite, Yellow Ochre .... .10
+*Linnæite,* cryst'd ..... .50
Lodestone ..... .25
Magnesite ..... .10
Magnetite, cryst'd ..... .20
Magnetite, granular ..... .10
Magnetite, Lodestone ..... .25
Malachite, capillary ..... .20
Malachite, massive ..... .30
Manganite, cryst'ne ..... .20
Marcasite ..... .20
Melanterite ..... .30
Menaccanite ..... .10
Mercury ..... .50
Meteoric Iron, etched..... .20
+*Millerite,* cryst'ne ..... .30
Mimetite, cryst'd ..... .50
Mispickel ..... .10
Molybdenite, cryst'd ..... .20
Monazite sand ..... .15
Microcline, Amazon Stone, cr'l. 25
Muscovite, crystal ..... .30
" sheet ..... .10
Natrolite, cryst'd ..... .30
Nephelite, Elæolite ..... .15
Niccolite, 25% ..... .40
+*Octahedrite,* cryst'd ..... .50
Oligoclase ..... .15
Olivine ..... .10
Opal, fire ..... .20
Opal, green ..... .25
Opal, precious ..... .50
Opal, Tripolite ..... .10
Opal, Wood ..... .20
Orpiment ..... .50
Orthoclase, cleavage ..... .10
Orthoclase, cryst'd ..... .30
+Orthoclase, crystal, Baveno tw. .30
+ " " Carlsbad " .20
Pearl Spar ..... .15
Pectolite ..... .20
Petrified Wood ..... .20
Petroleum, crude ..... .10
Phillipsite, cryst'd ..... .50
Phlogopite ..... .10

Platinum	$0.50
Polyhalite	.15
Psilomelane	.10
Prehnite	.20
Prochlorite	.10
Proustite, 2%	.50
Pyrargyrite, 2%	.50
Pyrite, cryst'd	.25
Pyrite, massive	.10
+Pyrite, altered, crystal	.25
Pyrolusite	.10
Pyromorphite, cryst'd	.20
Pyrophyllyte	.25
Pyroxene, Augite, cryst'd	.30
Pyroxene, Coccolite	.10
+*Pyroxene, Diopside*, crystal	.20
Pyroxene, Salite	.20
Pyrrhotite	.10
Quartz, Agate, pebbles	.15
Quartz, " pol.	.40
Quartz, Amethyst	.30
Quartz, Chalcedony	.20
+Quartz, cont'g liquid, crystal	.50
Quartz, Drusy, Geode	.10
Quartz, Flint	.10
Quartz, Itacolumyte	.10
Quartz, Jasper	.15
Quartz, Jasperized wood, pol.	.40
Quartz, " " rough	.15
Quartz, Milky	.10
Quartz, Moss Agate	.15
Quartz, Rock Crystal	.20
Quartz, Rose	.15
Quartz, Smoky	.10
Realgar	.50
Rhodochrosite	.15
Rhodonite, massive	.15
Rhodonite, Fowlerite	.15
+*Rutile*, red, crystals	.30
Rutile, twin "	.50
" Nigrine	.15
Satin Spar	.20
Scapolite	.15
+*Scheelite*	.50
Selenite	.20
Sepiolite	.50
Serpentine	.10
Serpentine, Chrysotile	.25
Serpentine Verde antique, pol.	.30
Siderite, cryst'd	.25
Siderite, massive	.10
Sillimanite	$0.15
+Silver, cryst'd	.50
Silver, disseminated grains	.30
+*Smaltite*	.50
Smithsonite	.20
Sodalite, 20%	.20
Soda Nitre	.10
Specular Ore—see Hematite.	
Sphalerite, cryst'd, black	.20
Sphalerite, cryst'd, brown	.20
Sphalerite, cryst'd, ruby	.20
Spinel, cryst'd	.25
Spodumene	.15
Stannite, 50%	.30
+*Staurolite*, twin crystals	.20
Stibnite	.20
Stilbite, cryst'd	.20
Stream Tin	.25
Strontianite	.10
Sulphur, cryst'd	.20
+*Sylvanite*, 1%	.50
Sylvite	.15
Talc	.10
Tetrahedrite, cryst'd	.50
Tetrahedrite, massive, 25%	.20
Thomsonite	.30
Titanite	.30
Topaz, crystals	.15
+*Torbernite*, cryst'd	.50
Tourmaline, black, cryst'd	.20
Tourmaline, green, crystals	.50
Tourmaline, Rubellite, cr'd	20
+*Triphylite*	.30
Turquois, 5%	.30
+*Uraninite*, 25%	.50
Vanadinite, cryst'd	.30
Vesuvianite	.20
Vivianite, cryst'd	.50
Wavellite, 25%	.20
Wernerite	.15
Willemite	.25
Witherite	.10
Wolframite	.50
Wollastonite	.20
Wulfenite, cryst'd, red	.50
Wulfenite, crys'td, yellow	.30
Yellow Ochre	.10
Zinc Blende—see Sphalerite.	
Zincite, 50%	.30
+*Zircon*, crystals	.15
Zoisite, 50%	.20



"Complete Mineral Catalog."

LATEST EDITION.

The most up-to-date compilation of the kind in print.

"*The Metallic Classification*" under each metal heading shows every mineral carrying such metal. Sub-divisions give the combination in which the metal occurs.

"*Dana's Classification*" is the most generally accepted mineralogical system. In this synopsis of Dana's great work is found name, composition and crystalline form of each species, as well as its varieties and related compounds.

"*The Alphabetical Index*" indicates by number the position of each mineral in this classification. Specimen prices are also shown.

"*Choice Minerals*" from many countries are briefly described and illustrated by numerous handsome engravings. Only the more notable of fine cabinet specimens are mentioned.

A volume which has won the commendation of thousands. Contains over 200 pages of useful data for all interested in pure or applied mineralogy.

Prices, postpaid, to any address: Paper, $0.25; bound in flexible cloth, $0.50.

Minerals Purchased or Exchanged.

While most of our stock is acquired through personal collecting, we also buy of collectors, mining men or others, who can supply specimens direct from localities. Three classes of minerals are wanted:

1. CABINET SPECIMENS of finely crystallized or rare minerals. They should show as large and perfect crystals as are obtainable. In the case of very rare compounds and such as do not crystallize, sometimes occurring as "pocket ores," massive specimens are valuable. Quality and perfection of crystals, or rarity, less often size or weight, determine values. No list can be furnished of this class of desiderata, as even slight variations are desired of minerals already largely represented in our stock.

2. STUDY SPECIMENS. When an opportunity is presented to improve the stock of any mineral, we usually lay in quantities varying between 200 and 2,000 pounds. They are paid for by weight when quality varies but little. Where they so occur, they are preferred crystallized. Pure massive material is wanted of many minerals used in laboratory work. Gangue specimens of the same minerals are useful as illustrating their associations. This becomes necessary with very valuable ores, where a small percentage of pure mineral in matrix is preferred to a free fragment.

3. LOOSE CRYSTALS of every kind bought by the hundred, by the thousand, or by weight.

OLD COLLECTIONS purchased for cash.

METEORITES wanted at good prices.

MAIL-SAMPLES, with exact locality, should accompany all offers, as no order can be given before seeing them. They may weigh about one or two ounces each, and show good crystallization when possible.

PAYMENT on delivery, at figures much above ore value.

PERFECTION OF CRYSTALLIZATION. The protection of crystals from scratches or bruises is imperative. A perfect crystal is worth two to ten times as much as one that has been broken or otherwise damaged in collecting or shipping.

INDEX.

Introduction to Previous Edition.

The COMPLETE MINERAL CATALOG has been compiled with the double purpose of advertising our business, and of gathering together valuable information for our own and others' use. It is larger than former catalogs, and we believe better arranged. The first part is taken up with a descriptive price-list of cabinet specimens and collections; the second with lists and tables of reference. With the rearrangement of the various collection lists to keep pace with new discoveries in mineralogy, it is hoped that the requirements of class and self-instruction are met to even a greater extent than before. Care has been exercised to give a just and accurate description of the various specimens offered for sale.

The engravings are another new feature, having been prepared expressly for this volume under our direct supervision, in the hope that artistic and scientifically exact illustrations might be obtained.

The idea of publishing a short table based on Dana's classification originated in 1876, and our catalog, which appeared in that year, contained the first "Table of Species." The large sale which this first edition and succeeding reprints met with; the approval everywhere won for it among scientists and educators, has led to the preparation of an entirely new table according to the last edition of Dana. As now presented, it states concisely the composition and form of each species, with a proper classification of its varieties. As before, an index and also a supplement are added. We have found a constant need in our work, of a classification of minerals according to their metallic constituents, showing at a glance what minerals contain given metals. Its usefulness was so manifest, that the lack of any complete list of the kind, led to the compilation of the one now published for the first time.

A WORD AS TO OUR BUSINESS. We supply institutions, teachers, students and professional men, with type specimens for study and reference. In the filling of these orders we draw from an enormous stock of minerals, which has been steadily increasing in volume and scope since the nucleus—Dr. Foote's private cabinet—was exhibited at St. Louis in 1875. The expansion of this great collection has been along lines indicated by the demand for good teaching material. The other important department secures through correspondence and personal collecting, newly-discovered species, or unique and choice examples of the familiar minerals, which are in demand among museums and private collectors.

* * * *

Rare Minerals for Technological and Industrial Purposes Supplied in Quantity to Manufacturers, Chemists and Experimenters.

Rare Element Minerals

In Large Quantity at Commercial Prices for the Use of Manufacturers, Chemists and Experimenters

The increasing use of the following ores in manufacturing processes, has led us to extend our connections with sources of supply in all parts of the world. While these facilities for commercially supplying rare elements are unrivalled, our experts are sent, if necessary, to distant countries, where the demand warrants such expenditure. The fluctuations in market values do not permit a published price list. Prices will be quoted to those stating quantities desired. Large or small lots supplied.

(For reference purposes, the list of minerals under each metal is made fairly complete. Not all of these are commercially available.)

BERYLLIUM—Beryllonite, Beryl.

CAESIUM—Pollucite.

CERIUM—Bastnasite, Aeschynite, Fergusonite, Samarskite, Monazite, Cerite, Allanite.

DIDYMIUM and LANTHANUM—Bastnasite, Aeschynite, Samarskite, Monazite.

ERBIUM—Fergusonite, Euxenite, Yttrotantalite, Cyrtolite.

GERMANIUM—Argyrodite.

MOLYBDENUM—Wulfenite, Molybdenite.

NIOBIUM—Columbite, Tantalite, Samarskite, Fergusonite, Euxenite, Aeschynite, Dysanalyte, Hielmite, Yttrotantalite, Microlite.

RADIUM—Uraninite, Gummite, Fergusonite, Carnotite, Uranophane, Samarskite, Torbernite, Autunite.

TANTALUM—Tantalite, Microlite, Hielmite, Yttrotantalite, Samarskite, Fergusonite, Columbite.

THORIUM—Orangite, Thorite, Aeschynite, Uraninite, Cleveite, Monazite Sand.

TITANIUM—Rutile, Brookite, Dysanalyte, Titanite, Keilhauite, Euxenite, Aeschynite, Ilmenite.

TUNGSTEN—Scheelite, Wolframite, Hubnerite.

URANIUM—Samarskite, Euxenite, Uranophane, Uraninite, Gummite, Cleveite, Carnotite, Torbernite, Autunite.

VANADIUM—Vanadinite, Endlichite, Descloizite, Carnotite.

YTTRIUM—Thalenite, Fergusonite, Euxenite, Yttrotantalite, Samarskite, Hielmite, Cleveite, Xenotime, Gadolinite.

ZIRCONIUM—Zircon.

CHOICE MINERALS.

Brief Mention of Recent Discoveries and other Interesting Minerals Offered for Sale in Fine Cabinet Specimens.

The following list briefly describes only one portion of our large series of cabinet and museum specimens, namely, the most noteworthy species secured direct from localities, either by correspondence with a local collector, or by personal visit. *Further, all here noted are now represented in our stock* by a series of selected specimens, permitting a good choice in every case. The aim has been to abridge rather than to lengthen this list. It might easily be trebled by the mere enumeration of rarities of which only a few were secured. This unnoticed portion of the stock changes so rapidly, that often the few good representatives of a mineral are sold as soon as advertised. Most of this class, however, are priced in the *"Alphabetical Index and Price List."*

With a view to more regular and systematic collecting, mineralogists are employed to travel for us. The advantage of such direct communication with distant localities is self-evident. The result has been a general levelling of prices to a standard of values permitted by these economies. Our collector in Australia has met with notable success, affording incomparable examples of the minerals of that country—e. g., the Crocoites, so imperfectly illustrated in this catalog, are classed among the finest crystallizations in nature.

Historical rarities, otherwise unobtainable, are acquired through our purchase of old collections. The rich Trautwine and Howell collections afford examples of this source of supply.

We have discontinued buying of or selling to other general mineral dealers. Customers in all countries can have specimens in lots of $20 or over, sent them carriage free for selection, and so avoid paying the profits of several retailers.

Your desiderata list, if filed with us, is frequently consulted and the gaps it represents often filled. General instructions as to limitations of size, price and character of specimens, aid in pleasing individual taste.

Prices are for good cabinet specimens in the most perfect crystallizations obtainable. Small pieces for amateurs and beginners may often be had at prices lower than the lowest quoted, while the highest price does not always refer to the best of the kind on hand. Our neat printed labels give correctly, scientific name, composition, form and locality.

American Localities.

Diaspore, Chester, Mass. Occurs in small transparent crystals of beautiful violet and amethystine tints, the terminal planes being especially lustrous. They are tabular in habit and occur grouped on Emery. Few have been found recently, and the mine dumps have been thoroughly searched. Our stock includes some fine groups, $1.00 to $9.00.

Fayalite, Rockport, Mass. A rare ferrous orthosilicate, belonging to the Chrysolite group. Only recently described from this locality by Penfield. We secured nine-tenths of the small find. Pure dark brown masses of typical resinous lustre, $1.00 to $6.00.

Chondrodite, Tilly Foster Mine, Brewsters, N. Y. The splendid crystallizations formerly found are no longer obtainable. We still have a few groups of bright ruby-like crystals, $.50 to $2.00.

Franklin Furnace, New Jersey, has furnished not only a greater variety of minerals than any other region of like size, but its long list of species peculiar to the locality is most exceptional. Frequent trips made by our collectors afforded material which has been described at length in the Am. Jour. Science. During the longest visit, four new species, previously announced, were found, besides seven then undescribed minerals, three of which were later described as new species by Prof. S. L. Penfield and Mr. C. H. Warren. Some of the new lead compounds as well as many of the older species, are similar to certain Swedish minerals. We offer the following characteristic specimens:

Nasonite (A. J. Sc., Vol. VIII., p. 346). $Pb_6 Ca_4 Cl_2 (Si_2 O_7)_3$. A new species which although massive, is a peculiarly interesting lead silicate. Its greasy lustre is a distinctive characteristic. To the small stock originally secured, nothing was added in spite of careful search. Specimens showing several associated minerals, $1.00 to $4.00.

Leucophoenicite (A. J. Sc., Vol. VIII., p. 351). A manganese Humite associated with green Willemite, Zincite, Franklinite and Hardystonite. Characteristic specimens of this new species illustrating the name ("pale purple-red") are sold at very reasonable rates, $.50 to $3.00.

Hardystonite (Prof. J. E. Wolff in Proc. Am. Acad. Sci., 34, 479 '99), $2CaO.ZnO.2SiO_2$. The interesting variations of this new species require several specimens for its proper representation, and as it is the cheapest new mineral on sale, a series is not expensive. Pieces neatly trimmed to 5 x 7 cm. size, showing the association of Garnet, Willemite, Zincite, Franklinite, etc., $.20 each. Larger at proportionate rates up to $2.00. (A few crystallized pieces at higher rates.)

Hancockite (A. J. Sc., Vol. VIII., p. 339). Occurring in druses of beautiful red monoclinic prisms with Axinite, Garnet, Franklinite, etc., $.20 to $3.00.

Roeblingite (A. J. Sc., Vol. III., p. 413). A new and interesting hydrous calcium silicate, containing sulphur dioxide and lead. Found in solid white masses of minute prismatic crystals somewhat resembling massive Datolite. Rare, $1.00 to $4.00.

Polyadelphite. Pretty groups of yellowish-brown dodecahedrons in white calcite, $.30 to $2.00.

Chalcophanite, crystallized (drusy), $.20 to $1.00.

Jeffersonite. Groups of large dull crystals. Found many years ago, $.75 to $5.00.

Yellow Axinite. Minute brilliant crystals in cavities, also massive, $.25 to $1.50.

Rhodonite var. Fowlerite. Beautiful groups of triclinic crystals, including a number of fine large museum specimens, $.50 to $10.00.

Zincite. Masses of the true blood-red color with pretty associations; also a micaceous variety. $.30 to $1.50. A few crystallized specimens at higher prices.

Fluorescent Willemite. Massive specimens of various shades, the apple-green quality being especially selected for its beautiful green fluorescence under the radium and ultra-violet rays. It is the most striking of the few minerals which have been found to exhibit the phenomenon to a marked degree. $.25 to $2.00.

Troostite, in symmetrical crystals. Now rare. $.50 to $3.00.

Franklinite. A good stock comprising specimens found some years ago. Large octahedrons, often modified by the dodecahedron. In Calcite. $.75 to $3.00.

Brown Tourmaline, Hamburg (near Franklin). Well developed crystals of varied habit. Light and dark shades. Their bright planes contrast well with the white Calcite. $.50 to $2.00.

Domeykite var. Stibiodomeykite, Mohawk Mine, Keweenaw Co., Michigan. New and interesting variety of a rare arsenide. Described by Prof. G. A. Koenig. Clean metallic masses with bits of the white limestone matrix attached. $.75 to $4.00.

Fluorescent Selenite, Mahoning Co., Ohio. The wonderful greenish luminescence excited by the new rays in these transparent crystals, has greatly increased the popularity, which their crystallographic perfection had already won for them. Various types 3 to 4 cm., $1.00 per dozen. Larger, $.15 to $.20 each. Second quality at lower prices.

Jamesonite, Silver City, S. D. A lead sulphantimonite formerly obtainable with difficulty. A visit to the locality secured a good supply of highly characteristic material. It possesses a bright metallic lustre and a feathery-granular structure. Exhibits the usual oxidation to Bindheimite. $.30 to $4.00.

Selenite (Plate XVI.), near Hermosa, S. D. This new locality is remarkable for its duplication of the "Model Selenites" of Ohio. While

often equalling the latter in symmetry and perfection of form, the new crystals are many times larger than the old. The largest crystals are slightly rougher. 5 to 12 cm. length. $.20 to $1.00.

Calcite Containing Sand (Plate XVII.). Devils Hill, S. D. Popularly known as "Sand Crystals" because of the 64 per cent. of quartz grains and pebbles enclosed. Analogous to the Fontainebleau crystals but of totally different type. Our collector made a ten-day trip to the locality, far from the railroads in the Pine Ridge Indian Reservation. These remarkable crystals have been investigated crystallographically by Prof. S. L. Penfield (Am. Jour. Sc.) and their mode of occurrence described by Prof. E. H. Barbour (Bull. Geol. Soc. Am.). The locality was well worked and only the best portion of the crystallizations handled were saved. By far the largest lot ever brought from the locality was shipped. It embraces the loose doubly-terminated steep hexagonal pyramids as well as hundreds of clusters and concretions of the same. 5 to 25 cm. $.20 to $8.00.

Melanterite, near Hayward, S. D. Solid fibrous masses of bluish green color. $.30 to $1.25.

Muscovite, near Keystone, S. D. Four-sided cleavages, popularly known as "Diamond Mica." The pinacoids are almost absent, the prismatic faces being highly developed. 8 to 15 cm. $.30 to $2.00.

Spodumene. Perfect cleavages of exceptionally sharp outline and neat form. $.15 to $2.00.

Columbite. Good crystals, detached and in white matrix. $1.00 to $6.00.

Rose Quartz, Custer, S. D. Fine deep colored pieces of best quality. $.15 to $.75.

Very large masses for museum display, also polished balls and slabs. $1.00 to $12.00.

The Joplin District is universally known as one of the richest specimen fields in the world. Frequent visits afford us a large stock of the following:

Calcite. Superb scalenohedrons of transparent quality and various shades of amber and amethyst. Twinned crystals of various types. Price varies with size. $.15 to $6.00.

"Giant Phantoms." Scalenohedral crystals enclosing small spear-shaped Marcasite crystals, regularly arranged in bands, giving a shadow or phantom effect in the interior. 25 to 50 cm. diameter. $7.00 to $10.00.

Iceland Spar. Pale amber and amethystine rhombs. Also showy twinned cleavages. $.30 to $2.00.

Galena. Octahedrons, cubes and cubo-octahedrons. Some on pearl spar; others on blende coated with bitumen. $.40 to $1.50.

Sphalerite. Many choice examples—either the darker "black jack" or the rich "ruby blende" in most attractive groups. $.20 to $3.00.

PLATE XVII.

CALCITE CONTAINING SAND. DEVIL'S HILL, PINE RIDGE INDIAN RESERVE. SOUTH DAKOTA.

REDUCED 1/3.

PLATE XVI.

ALMANDITE GARNET. SALIDA, COLORADO.

SELENITE. HERMOSA, SOUTH DAKOTA.

Chalcopyrite on Pearl Spar. A pretty representation of both species. The sharp model-like sphenoids are scattered over the pearly Dolomite crystallization. $.20 to $1.50.

Calamine, Granby, Mo. Familiar drusy crystallizations, but quite superior in the size and development of the individuals. They are symmetrical prisms of 2 to 3 mm. length, distinct in outline, brilliant and transparent. $.25 to $1.00.

Greenockite. As a bright yellowish green coating on Blende and Marcasite. $.75 to $4.00.

Since the first collecting trips made to Hot Springs and Magnet Cove, Arkansas, and the large sales of Quartz, Brookite and Rutile which followed, our stock has been frequently replenished by the specimens secured in later visits and in work done expressly for us at the localities.

Quartz var. Rock Crystal. The largest stock of these splendid crystallizations in the world. Showy clusters 7 to 40 cm. across. $.20 to $25.00.

Detached crystals. $.10 to $1.00.

Flattened and other abnormal forms. $.20 to $3.00.

Monticellite. Distinct crystals of about 1 to 2 cm. diameter in Calcite matrix. $.30 to $4.00.

Dysanalyte. Bright cubes, cubo-octahedrons and octahedrons in matrix. $.50 to $2.00.

The same, loose, 10c. to $1.00 per dozen.

Wavellite. Handsome specimens, showing green radiations on a flat matrix. Some exhibit hemispheres with surfaces composed of terminations of the crystals. $.20 to $3.00.

Rutile, Nigrine, Magnet Cove. Geniculated forms of twinning, sixlings and eightlings.

Brookite in single detached crystals of symmetrical orthorhombic form and brilliant planes. $.10 to $1.50.

Rutile Paramorph after Brookite. Excellent representatives of this curious alteration. $.20 to $1.50.

Magnetite var. Lodestone. Masses possessing strong polarity, picking up tacks, nails and chisels. $.25 to $4.00.

Tourmalinitic Quartz, near Silver Star, Montana. Plate XVIII. We secured direct from the locality over 1200 crystals of this interesting gem stone. A rough stem or "core" densely coated and filled with Tourmaline needles, sometimes forms the end of the crystal carrying the most Tourmaline. The presence of an excess of Tourmaline interrupts the Quartz crystallization, the inclusions lessening in number as the opposite and perfect end of the crystal is approached. The Quartz is of the smoky variety, the Tourmaline giving it a greenish tinge. Excellent examples, some doubly terminated, from 4 to 12 cm. long. $.15 to $.75.

Cabinet specimens 5 to 20 cm. $1.00 to $3.00.

Museum crystals up to 45 cm. at higher prices.

Polished cross-sections are of exceptional beauty and interest, showing the delicate needles branching in every direction. They often exhibit shadowy hexagonal banding, marking the crystal growth. The two rhombohedrons of which the termination is composed are sometimes shown by differences in depth of color (note alternate triangles illustrated). 3 to 10 cm. diameter. $.50 to $4.00.

Amethyst Cappings. In the same find were a few choice Amethyst crystallizations arranged in paralleled groups, often capping the Smoky Quartz in a unique manner. $1.00 to $6.00 for the larger. Excellent Amethyst crystals, $.30 to $1.50.

Opal-Wood (Plate XIX.), Clover Creek, Lincoln Co., Idaho. Considerable work done at this locality secured us all the solid branches suitable for specimens. It appears to have been a finely-marked oak or similar species, the small cells, tissues, rings, radial lines, knots, bark and other marks of growth being shown with a marvellous perfection and minuteness of detail. All this is reproduced in a lustrous brown-yellow semi-opal, the various shades being occasionally contrasted with a rich dark brown opal at the centre. The section illustrated is an average specimen. Large show specimens, polished cross sections of the limb, showing bark, complete, 12 to 20 cm. diameter. $6.00 to $15.00.

5 to 10 cm. diameter. $2.00 to $4.00.

Selected pieces with high natural polish, showing structure, but not complete sections, 7 to 15 cm. diameter. $.20 to $1.00.

Giant Selenites, Wayne Co., Utah. A good stock of these well-known crystals still on hand. Sizes vary from 30 to 90 cm. in length, the monoclinic form being well shown. Their great size and transparency make them desirable for museum display, or to crown the top of a private cabinet. $3.00 to $12.00.

Cleavages, perfectly transparent, $.10 to $.75.

Cleavages containing moving bubbles, $1.00 to $4.00.

Microcline var. Amazon-stone, Pikes Peak, Colo. This superb Feldspar became widely distributed through our sale of it at the Philadelphia Exposition in 1876. The large and strikingly definite form and splendid green color, places it among the showiest of all crystallizations. We did much extensive and costly work at the locality in the 'seventies, and with later accessions, have had several tons of selected material. A varied assortment of groups and detached crystals of first quality and all sizes at $.25 to $7.00.

Tourmaline, near Canon City. A new find of brilliant long black prisms in white Quartz. Curved and interrupted crystals frequent. The most striking and handsome Tourmalinitic white Quartz on record. $.40 to $2.00.

PLATE XVIII.

SMOKY QUARTZ CONTAINING TOURMALINE.

SILVER STAR, MONTANA.

PLATE XIX.

OPALIZED WOOD. CLOVER CREEK, IDAHO.

Garnet, Salida, Colo. Plate XVI. These dodecahedral Almandites are invaluable for crystallographic illustration on account of their large size and remarkable symmetry and perfection. We secured several thousand by working the mine, and offer complete crystals 4 to 10 cm. diameter at $.75 to $3.00 each. Broken crystals indicating the form. $.20 to $1.00.

Aragonite, altered, Fort Collins, Colo. Well defined hexagonal tables 2 to 5 cm. Some showing the lines of orthorhombic twinning similar to the well-known type from Bastennes, only more tabular. Also penetrating groups. $.20 to $1.00.

Carnotite, Montrose Co., Colo. Selected examples of this yellow uranium mineral in exceptionally pure specimens. $.75 to $4.00.

Endlichite, Hillsboro, New Mexico. All the finest specimens found were preserved and shipped to us for over a year. The mineral possesses an adamantine lustre, clear transparent quality, exquisite regularity and definiteness of outline, and color shading through yellow, red and brown. It offers a striking example of the gradations between species, both in its chemical and physical characters, as its variations display all the peculiarities of color and form of both Mimetite and Vanadinite, with many intermediate stages. In composition it is between the two, being a combination of the arsenate with the vanadate and chloride of lead.

A large stock of matrix specimens of various shades of red and yellow. The different types illustrated are selling at greatly reduced prices. For the choicest groups of brilliant, perfect crystals, $.30 to $2.00.

Single crystals $.10 to $.50 per dozen.

Melanotekite, Hillsboro. Described from this first American locality, from material furnished by us. (A. J. Sc., V. VI., p. 116). It is a rare lead-iron silicate, heretofore found only in Sweden. Masses showing drusy surfaces of orthorhombic crystals. $.40 to $2.00.

Meteoric Iron, Sacramento Mts., N. M. See Meteorites.

Aurichalcite, Magdalena, N. M. In tufts and velvet-like surfaces lining cavities. The acicular crystals are distinctly visible. Of a beautiful and delicate bluish green color, affording rich and showy specimens. $.20 to $2.00.

Allophane, cupriferous. One of the handsomest bits of color to be found. Its sky-blue shades much resemble some Turquois. In bright masses of good size, occasionally with a botryoidal surface. $.25 to $1.25.

"Papierspath." These mines have yielded the best quality of this paper-like variety of Calcite. Hexagonal plates 1 to 2 cm. across, are grouped in pretty flower-like clusters. The glistening surfaces and translucent quality lend the specimens an icy aspect. They are of neat

size and quite durable, considering their exquisitely delicate appearance. $.50 to $2.00.

Yellow Wulfenite, Organ Mts., N. M. A variety of forms in this beautiful crystallization. Groups of thin quadrangular plates, yellow or brown, often transparent. Also in long tetragonal prisms with basal plane; again of cubic symmetry. $.30 to $5.00.

Red Wulfenite, Red Cloud Mine, Ariz. One of the most beautiful crystallizations in nature. We were the first to collect this gorgeous variety in any quantity, and by several visits to the mine obtained the best specimens known. Crystals 1 to 2 cm. $.10 to $1.50.

Groups of Crystals, $.50 to $12.00.

Jasperized Wood, Chalcedony Park or Great Petrified Forest, Ariz. This splendid petrifaction with its shades of red and violet charmingly blended, is well known. A personal collecting trip brought us choice examples of trunks up to 40 cm. diameter. Polished sections showing the bark, 3 to 20 cm. diameter. $1.00 to $12.00.

Selected pieces unpolished. $.15 to $5.00.

Fluorite, Castle Dome Dist., Ariz. Octahedral cleavages of pink and emerald green shades. $.10 to $.75.

Lawsonite, Tiburon Peninsula, Calif. A new species in well-defined orthorhombic crystals, up to 2 cm. in length, of varying habit. A basic metasilicate of calcium and aluminium. We purchased most of the best specimens found, working over a quantity of the Margarite schist to develop a few fine crystallizations. $1.50 to $10.00.

Less perfect but typical matrix specimens and detached crystals. $.20 to $1.00.

Hanksite, Borax Lake. A lot which was the result of several years' saving, includes three different types of perfect and complete crystals. They are translucent and as regular as models. $.25 to $2.00.

Thenardite. Fine orthorhombic crystals 5 to 8 cm. long. The unit prism *m* and macrodome *t* predominate. Single and grouped. Their large size makes them useful for crystallographic demonstration. Large groups of the same. $.50 to $3.00.

Small cruciform twins and simple crystals, 3 cm. long. $.10 to $.20.

Halite or Rock Salt. Curiously distorted and abnormal forms of the cubo-octahedron. The beauty and oddity of these transparent, sharp-angled crystals, found for them a large sale. 3 to 5 cm. long. $.10 to $.25.

Northupite. W. M. Foote, A. J. Sc., V. L., p. 480; J. H. Pratt, A. J. Sc., V. II., p. 123. The comparatively small find of this new species was purchased by us entire. Occurs in small octahedrons with triangular markings. Regularly arranged dark lines in the interior are due to inclusion of carbonaceous matter. $.20 to $1.50.

Colemanite (Plate XX.), San Bernardino Co., Calif. We have the only good stock of this mineral in the world. In the lower part of the plate are shown a group and a detached crystal, the latter in one of many habits assumed. Its adamantine lustre prevented good photographic reproduction. It is a perfectly stable and solid compound and a most beautiful example of the class of borates. $.50 to $7.00.

Tourmaline var. Rubellite (Plate XXI.), Pala, San Diego Co., Calif. We were the first to offer for sale this deservedly popular mineral. The delicate pink crystals radiate through a lilac Lepidolite rock, presenting a most charming combination of colors. As a showy cabinet specimen, or for ornaments, paper-weights, etc., it has few rivals in cheapness or beauty. Museum specimens 15 to 40 cm. across, with large radiations of crystals. $1.50 to $8.00.

Choice smaller pieces, $.20 to $1.00.

Several months of work by experts in exposing the crystals of the finer pieces, has developed some unique and strikingly beautiful crystallizations for museums. The careful chiseling leaves the terminated crystals standing in bold relief on the Lepidolite base, as figured. $2.50 to $25.00.

Opal var. Common Green-opal, Waterville, Wash. The handsomest and cheapest semi-opal known. A mottling of red through the translucent olive green adds much to its beauty. Polished sections showing the blending colors. $.75 to $4.00.

Rough pieces, $.25 to $2.00.

Canada.

Molybdenite Crystals (Plate XXII.), Aldfield, Pontiac Co., Quebec. We did considerable quarrying solely to secure these crystals, dynamite being steadily employed to remove the mass of rock overhanging the vein. Many crystals were destroyed, but a number were saved, which will rank always as superb specimens. The work was abandoned when the last two weeks of labor resulted in uncovering but one crystal of any value.

The crystals measure from 1 to 5 cm. diameter. They occur in short hexagonal prisms, often brighter and better defined than the large crystals figured. While the very finest have been acquired by the great museums, a few remain which are unsurpassed by anything for sale elsewhere.

Prices are about one-half former rates. Cabinet specimens, cleavages, and crystals in matrix. $.20 to $4.00.

A few choice large museum pieces. $5.00 to $10.00.

Zircon, near Eganville, Renfrew Co., Ontario. The twin crystals were first brought to the attention of mineralogists in 1881 by Dr. Foote.

Choice matrix specimens. $.50 to $4.00.

Apatite. Doubly terminated sharp-edged hexagonal prisms, 5 to 10 cm. $.20 to $3.00.

Titanite, Sphene. In the symmetrical, dark brown crystals so well known from this locality, 2 to 4 cm. $.30 to $2.00.

Perthite, "Sunstone," Perth, Ontario. A curious mixture of feldspars, having a pretty aventurine effect. 5 to 12 cm. $.20 to $1.50.

Labradorite, Pauls Island, Labrador. A familiar and beautiful ornamental stone. Fine polished pieces reflecting shades of red, green, blue and violet. $.50 to $2.00.

Sperrylite, Sudbury, Ont. Platinum arsenide in microscopic crystals. $1.00 to $4.00.

Sodalite, Hastings Co., Ont. A beautiful Prussian blue, streaked occasionally with light azure. They are the cheapest and best examples of the mineral yet found, and should be in every collection. Shapely cabinet pieces, showing fresh fracture, 4 to 12 cm. $.20 to $1.50.

Polished. $.50 to $4.00.

Pyroxene, var. Augite, Hastings Co., Ont. Large green crystals in Calcite. $.30 to $1.00.

Native Arsenic, Queen Charlotte Islands, Brit. Col. A recently opened and promising vein on Alden Island, affords masses of the pure mineral quite equal to the Saxon product. Typical mammillary masses prettily contrasted on white Calcite.

Mexico.

Boléite, Boleo. A stay of several weeks in this locality, together with later purchases, has given us a wonderful series of this beautiful and rare new mineral. Occurs in cubes and cubo-octahedrons, sometimes a centimeter or more in diameter; composition: $PbCl_2+CuOH_2O+\frac{1}{3}AgCl$. The mineral exhibits some interesting figures when cleaved parallel to the face of the cube. It is pronounced pseudocubic, belonging to the tetragonal system.

Perfect loose crystals, 3 to 12 mm. diameter, bright, sharp, and of beautiful indigo-blue color. $.20 to $3.00.

Cumengite. Occurs ordinarily in bright octahedral crystals but a few millimeters in diameter, in a gangue of white clay. Usually modified. Composition: $PbCl_2$. $CuOH_2O$, differing from Boléite by the absence of $\frac{1}{3}$ AgCl.

Beautiful "trillings," acute or truncated, 2 to 8 mm. diameter. $.50 to $4.00.

Calcite, Guanajuato. Personal trips to the far famed "Andreasberg of America," and several recent shipments afford us a rich stock of the numerous habits of Calcite which occur here in infinite variety. A dozen or more types, including several twinned forms, are represented. One of these is here shown. Beautiful and perfect crystallizations, occasionally implanted on Amethyst. $.25 to $4.00.

PLATE XX.

SULPHUR. CIANCIANA, SICILY.
COLEMANITE. SAN BERNARDINO CO., CALIFORNIA.

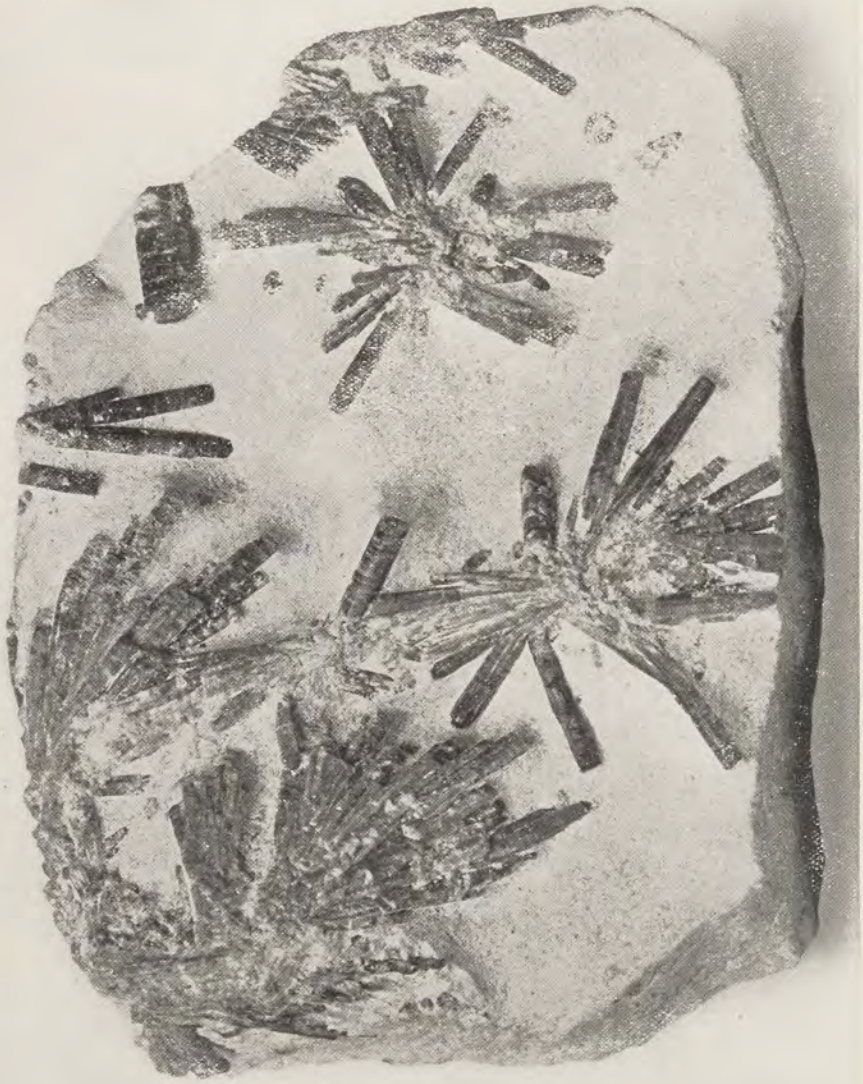


PLATE XXI.

TOURMALINE VAR. RUBELLITE.

PALA, CALIFORNIA.

Pseudo-octahedral Fluor, built up of minute cubes and dodecahedrons. The etched faces are surmounted by brilliant modifications. Also simple octahedrons and dodecahedrons. Groups. $.50 to $2.00.

Quartz Crystals containing moving bubbles. Excellent little specimens at one-third former prices. $.20 to $.75.

Amethyst in groups of unrivaled richness and depth of color. Also specimens showing more delicate shades. $.30 to $2.00.

Stilbite. Delicate cream colored groups of unusual beauty. Crystals symmetrical and well defined. $.20 to $1.50.

Rose Apophyllite in handsome groups of pyramidal crystals. Beautiful white and colorless crystallizations. $.40 to $6.00.

Fluorescent Hyalite. Clear botryoidal masses of glassy lustre, exhibit the most beautiful green luminescence before the ultra-violet rays. $.40 to $3.00.

Guanajuatite. Bismuth selenide. Typical pieces. $1.00 to $4.00.

Cuprodescloizite. A Descloizite containing 8 per cent. of copper. Occurring in drusy botryoidal masses; 4 to 10 cm. $.25 to $1.50.

Fire Opal, Queretero. In trachyte matrix. $.20 to $1.50.

Mexican Onyx, Tecali. Beautiful polished examples of this well known variegated marble. $.30 to $1.50.

Norway and Sweden.

The more important localities were visited. At Arendal a small steamer was hired, and many points reached, which are inaccessible by the ordinary modes of travel. These special efforts furnished more than one great European collection with species formerly unrepresented.

The species collected and purchased numbered over one hundred, of which we mention but a few examples.

Thalenite, Osterby, Sweden, Geol. For. Forh. XX., 308. A new and very rare mineral, containing the largest percentage of yttrium in any natural compound. $1.50 to $6.00.

Meliphanite, Langesund. Typical yellow masses. $.75 to $3.00.

Orangite. Translucent pieces. $1.00 to $4.00.

Eudidymite. Heretofore rare. Excellent crystals of typical monoclinic form. $.40 to $1.50.

Native Lead, Langban. Very rare. Flattened masses of the pure metal, on matrix. $.50 to $3.00.

Broggerite. Variety of Uraninite. Cubo-octahedrons. $1.00 to $8.00.

Monazite. Good monoclinic crystals. $.25 to $1.00.

Aeschynite, Arendal. Bright masses. $1.00 to $4.00.

Thorite. Detached prismatic crystals. $.50 to $6.00.

Rhodonite var. Paisbergite, Paisberg. One of the few showy Scandinavian minerals. The crystals are of exquisite pink color, bright and of well-defined triclinic form, though of different habit from the better known Fowlerite. Grouped in cavities of hard rock. 4 to 10 cm. $.30 to $5.00.

Brandtite. Small crystals on matrix. $.75 to $3.00.

Vesuvianite, Eker. Bright groups of sharp crystals. $.50 to $2.00.

Chondrodite, Nordmark. Large grayish green crystals. $.75 to $3.00.

Garnet, Bodo. Remarkably perfect and sharp dodecahedrons and trapezohedrons, loose. $.15 to $.25.

Xenotime, Tvedestrand. Massive and crystallized. $.50 to $4.00.

Oligoclase var. Sunstone. Highest gem quality. Rough and polished. $.75 to $4.00.

Samarskite, Satersdalen. Typical masses. $1.00 to $2.00.

Gadolinite. Crystals and masses. $1.00 to $15.00.

England.

Probably no mining region in the world has yielded a greater abundance and variety of strikingly handsome crystallizations, than the northern counties of England. Repeated personal visits and long established connections at the mines have greatly enriched our stock. Several large recent consignments afforded the following, among which should be noted the entirely new types, as the mere species names are misleading:

Quartz-coated-Fluors (Plate XXIII.), Weardale, Durham. Flashing groups of blue and purple cubes, daintily sprinkled with natural gems of the "Herkimer County" quality. This new combination is assuredly one of the handsomest and most attractive known to mineralogists. *One of our best large groups was sold to an English museum, possessing an unrivalled series of Fluorites.* Later, we received equally fine ones. Can more be said as to the quality of this new and limited find? The older and vastly inferior type coated with Milky Quartz is also plentifully represented in our stock. $.50 to $20.00.

Fluorite. All the ordinary and some extraordinary kinds. A large stock of the familiar colors; blue, purple, green and yellow in countless shades. One of the ever popular minerals on account of its rich hues and the lustrous quality of the transparent crystals. We have all grades from the huge cubes at about $.40 per kilogram, up to the superb transparent crystals of adamantine lustre, with faces showing vicinal planes, and interior lined in vari-colored parallel bands. Also the rare complete cubes in symmetrical, elongated and flattened habits. Prices much reduced. $.20 to $12.00.

PLATE XXII.

MOLYBDENITE. ALDFIELD, QUEBEC, CANADA.

PLATE XXIII.

FLUORITE COATED WITH QUARTZ.

WEARDALE, DURHAM.

Barites, Frizington, Cumberland. An excellent assortment of the various forms and colors. Splendid golden yellow and brown prisms. Blue tabular crystals in delicate groups, etc., etc. $.30 to $5.00.

Calcite. In showy groups of several types. $.50 to $3.00.

Smoky Quartz on Hematite. Brilliant and perfect dodecahedral Quartz crystals, on sparkling surface of velvet-black Hematite. $.30 to $2.00.

Aragonite. Luminesces beautifully under the ultra-violet rays. Groups of "Cathedral Spires." $.30 to $1.00.

Barytocalcite. Distinct crystals in groups, 4 to 8 cm. $.40 to $1.50.

Witherite, Alston Moor, Cumberland. Six-sided pyramidal crystals (orthorhombic twins) on matrix. $1.00 to $6.00.

Sphalerite, Nenthead, Cumberland. Brilliant and sharply defined crystals, scattered attractively over white druses of pseudomorphous Quartz. An odd and very pretty novelty. $.75 to $8.00.

Matlockite, Matlock. Secured through the purchase of an old local collection. Now very rare. Tabular crystals. $1.00 to $15.00.

Stannite, Cornwall. Masses with Chalcopyrite. $.30 to $1.25.

Wolframite. Bright cleavage pieces. $.50 to $2.00.

Siderite. In groups of excellent crystals in various habits. $.30 to $2.00.

Switzerland.

Terminated Cyanite (Disthene), Plate XXIV. Pizzo Forno, near Campolungo, St. Gothard Region. Sapphire blue of the true shade is to be found in this popularly named "False Sapphire." A trip by our collector and considerable work done for us, yielded some superb specimens. The locality has been known for over half a century, but like many others situated on the snow clad peaks of Switzerland, is quite unworkable save during a few weeks of the year, and rarely visited even then. Thus the specimens are not new—just vastly superior to those in the large museums, all of which have the early specimens, consisting of a rough network or mesh of crystals penetrating the Paragonite gangue. These specimens, however, are fast being replaced or supplemented by selections from our latest find.

Recognizing that painstaking and delicate hand-work on the development of the better specimens, would be appreciated, many months of expert labor were devoted to the removal of the Paragonite matrix. The transparent blue Cyanite blades were thus exposed, associated with lustrous dark brown Staurolites, often parallel and penetrating. This association is mentioned in some of the mineralogies, which likewise refer to the Cyanite as "rarely terminated." Yet we have Cyanites 10 or 12 cm. long, perfectly terminated by the simple pyramid *q* and

penetrating the length of a Staurolite crystal. This peculiarity, together with the contrasting blues and browns standing out in strong relief on the glistening and pearly background, affords one of the most striking combinations to be seen in any collection. Both minerals occur in well defined symmetrical crystals of a quality superior to that of any other locality. The Cyanite usually exhibits strongly marked polysynthetic twinning. The stock of really fine specimens is limited and rapidly diminishing. $2.00 to $15.00.

Small matrix pieces. $.30 to $1.50.

Detached crystals, $.30 per dozen to $1.00 each.

Terminated crystals. $.50 to $3.00.

Staurolite, Pizzo Forno. We have but an occasional specimen in which this species predominates, the principal mineral generally being the Cyanite. A few of very choice quality. $1.00 to $6.00.

Detached crystals, parallel or penetrated by Cyanite, as illustrated in Plate XXVI. $.50 to $1.50.

Broken crystals. $.50 per doz.

Hematite, "Eisenrose," St. Gothard. In the well-known twinning aggregates. $.50 to $20.00.

Octahedral Rose Fluor. A beautiful and highly prized variety, which like the "Eisenrose," is held at fancy prices near the locality. $2.00 to $25.00.

Axinite. A few bright groups of these brilliant triclinic crystals. $.75 to $6.00.

Anatase. Small crystals on matrix. $.50 to $2.50.

Quartz. Smoky crystals, with the *s* plane prominent. $.30 to $2.00.

Italy.

Several extended trips were made between 1890 and 1901 to Sicily, Elba, Sardinia, and important localities on the peninsula. More than ninety boxes of minerals were thus obtained, which with consignments received later, comprise, unquestionably, the finest and largest stock of Italian minerals existing in Europe or America. The material was *acquired at the mines,* and in some instances during the period when the finest crystallizations were most abundant. Hence, gorgeous Sulphurs and other formerly expensive minerals are now being sold at incredibly low prices; in some instances at less than they could be bought at retail in Italy. Visits to the leading mineral collections, secured historical rarities through personally selected exchanges, which are quite unobtainable otherwise, the localities being long since exhausted or annihilated, as in the case of certain Vesuvian species. (The rarest of these are not noted here, because of the meagre supply. In some instances the last duplicates came to us.)

PLATE XXIV.

CYANITE. ST. GOTHARD REGION, SWITZERLAND.
REDUCED 1/3.

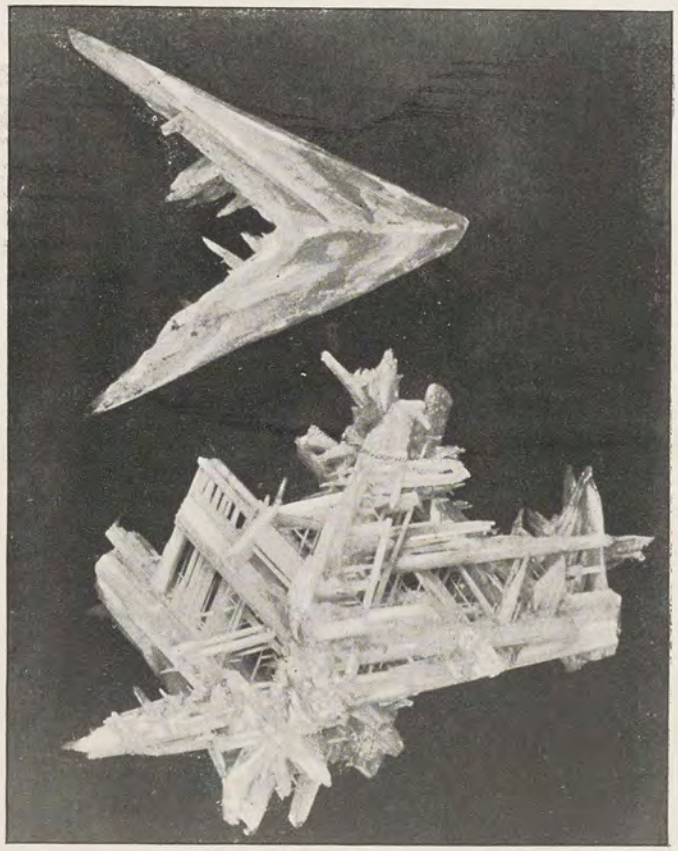


PLATE XXV.

CERUSSITE. BROKEN HILL, NEW SOUTH WALES.

Sulphur (Plate XX.), Cianciana, Sicily. It is impossible to describe the superb beauty of this mineral to those unfamiliar with it, and our illustration gives but a poor idea of its appearance. Flashing groups of perfect, yellow crystals, 5 to 30 cm. $.20 to $25.00.

Sharp detached crystals, transparent, 2 to 5 cm. $.20 to $1.50.

Selenite. Perfectly transparent "fish-tail" twins. Very showy as case specimens. $.20 to $3.00.

Selenite inclosing Sulphur or Aragonite. One of the most interesting examples of the phenomenon of inclusion. $.75 to $3.00.

Melanophlogite. A pseudomorphous form of silica, occurring in translucent cubes on Sulphur. $.30 to $2.00.

Aragonite. Splendid groups of six-sided prisms (orthorhombic twins, showing the striæ plainly). The crystals are pale blue or yellowish, very brilliant and often measuring 3 cm. across. $.50 to $8.00.

Calcite pseudomorph after Aragonite. These curious six-sided hollow forms show the partial replacement of the original prism, the twinning striæ being indicated by radiating fissures. Odd and exceedingly attractive. Choice specimens 7 to 25 cm. $.50 to $5.00.

Celestite. Showy groups of milky to colorless prismatic crystals of sharply defined and symmetrical habit. $.50 to $6.00.

Hematite, Elba. These wonderful crystallizations have been long and widely known. The pyramid *n*, rhombohedron *r*, and curved rhombohedron *u* predominate. Crystals in varied form, measuring 1 to 4 cm., are coal-black, brilliant and sharply defined. Groups 5 to 10 cm. $.30 to $1.50.

Detached crystals. $.10 to $.50.

Pyrite. The commonest form is the pyritohedron, frequently modified by the octahedron. Simple crystals and penetration twins, 2 to 4 cm. $.10 to $1.00.

Tourmaline. We secured a large lot of crystals of good quality at a low figure and offer them at exceptional prices. Broken prisms in various colors. $.10 to $.20.

Terminated crystals. $.25 to $10.00.

Phosgenite, Monte Poni, Sardinia. Brilliant well-formed crystals, some over 2 cm., on matrix. $.75 to $5.00.

Anglesite. Our specimens bear out the assertion that this locality produces the finest Anglesites in the world. Clear-cut, sharp crystals, colorless to gray-black; all of a dazzling adamantine lustre.

Neat matrix specimens. $.50 to $3.00.

Cerussite. In delicate "wheat-sheaf" twins. $.30 to $2.00.

Piedmontite, St. Marcel, Piedmont. Typical masses of the pure mineral and crystallized in Quartz matrix. $.30 to $1.50.

Violan. Characteristic specimens. $.30 to $1.25.

Babingtonite, Baveno. A new find affording a small number of the finest crystallizations ever seen of this rare triclinic mineral. New and abnormal crystal habits. $1.50 to $8.00.

Baveno Twins of Orthoclase, Baveno. Type specimens at lower prices than foreigners pay at the much visited quarries. $.30 to $1.00.

Bavenite. A new zeolite occurring in orthorhombic blades, grouped in white radiating spherical tufts on Orthoclase. Composition, $Ca_3\ Al_2\ Si_6\ O_{18}\ H_2\ O$. Extremely rare. We have but a few typical specimens. $2.00 to $8.00.

Cavernous Quartz, Poretta. Several thousand were secured at a cost which permits retailing excellent crystals, at $.10 to $.35 each.

Crystals containing moving bubbles. $.20 to $2.00.

Fiorite, Santa Fiora. Pearly concretions of botryoidal and stalactitic form. $.25 to $1.00.

Meneghinite, Bottino. The mines were worked in the days of the early Romans. The species is exceedingly rare, a visit to the mine securing the only available crystals in Italy. We offer crystals 1 to 2 cm. long, $.75 per dozen.

Quartzine. Typical masses of compact fibrous structure with satiny "cat's-eye" reflections. $.40 to $1.50.

Selenite and Sulphur, Bellisio Solfare. New and most interesting habits are shown in a quality of crystals which excel in their perfect limpidity and lustre, the finest products of other localities. Rare. $1.00 to $4.00.

Nephelite, Capo di Bove. Perfect little hexagons of matchless symmetry and lustre, implanted on lava. Desirable for the reflecting goniometer. A large stock of pieces 4 to 10 cm. $.50 to $2.00.

Melilite. In short tetragonal prisms of yellow color, often associated with Nephelite. $.50 to $3.00.

Granuline. White granular masses. $.40 to $1.50.

Euchlorine. Green drusy crystallizations. $.50 to $1.50.

Meionite. Glassy and milky tetragonal prisms in matrix. $.50 to $2.00.

Australia.

Our introduction in 1896 of various unique Australian minerals was but a forerunner of many later and more notable finds. As soon as the necessity for having a traveller in this new and rich field became manifest, we secured the services of a mineralogist possessing an intimate acquaintance with Australian localities. Thus were we not only the first to place a large choice of these minerals before American and European museums, but we have from season to season, for eight years, augmented our stock with the results of oft-repeated trips to the principal localities. In one instance more than a year was spent at one mine. The combined stocks of all other dealers do not approach our

series of Australian minerals, either in quality or variety. The economy of this direct gathering of specimens at the mines has permitted heavy reductions in the prices of nearly all of the following, present prices often being less than half the early figures.

Broken Hill, New South Wales. In this district lead and silver have been steadily mined for many years, and it has ranked as one of the best paying group of mines in the world. The numerous shafts sunk disclosed a veritable treasure ground for science. Unhappily the oxidized zone has been passed and good crystallizations are yearly becoming rarer.

Stolzite. $PbWO_4$, Tetragonal. A comparatively new but already well-known find. The crystals, showing the two pyramids and base, are infinitely superior to the old German examples. Groups of brilliant yellowish brown crystals, 1 to 5 mm. or more. Some daintily scattered over the matrix. Rare. $2.00 to $15.00.

Cerussite. (Plate XXV.) Stellated and "Spear-head" twins. Never has this beautiful mineral been seen in more magnificent crystallizations than these. A fine satiny adamantine lustre is shown alike on both the delicate gray-tinted and the snow-white crystals. A variety of form is exhibited in reticulated groupings and loose twins. $.50 to $12.00.

Anglesite Coating Twinned Cerussite. (Plate XXVI.) A deposit of small brilliant Anglesite crystals on the Cerussite. The general outlines of the primary crystallization are beautifully shown. Selected cabinet specimens up to museum size. $.50 to $10.00.

Golden Anglesites. Like the foregoing, but the Cerussite base less prominent, the Anglesite crystals being better defined, and often exceeding 1 cm. They are of a brilliant golden or honey-yellow tint. A multitude of complex and interesting habits. $.50 to $5.00.

Azurite. Groups of definite and brilliant tabular crystals of 2 to 12 mm. size; fine color, gemmy quality. $.30 to $1.50.

Embolite. Symmetrical cubes with one or both tetrahedra, 1 to 2 mm., scattered over a Limonite matrix. $.50 to $3.00.

Iodyrite. In minute crystals on matrix, illustrating the hemimorphic hexagonal character. Rare. $1.50 to $8.00.

Strontianocalcite. In opaque white globules whose surfaces consist of terminations of acute rhombohedrons. The globules are 2 to 12 mm. diameter and neatly mounted on a dark stalactitic Limonite. Minute isolated rhombohedrons are often present. Also in botryoidal masses of pale pink tint. $.50 to $3.00.

Pyromorphite. Aggregates of rich brown hexagonal crystals of good size, at once suggesting the familiar specimens from Nassau. Smaller crystals massed in arborescent groups. $.20 to $3.00.

Harlequin Opals, White Cliffs, New South Wales. These newly opened opal fields were visited by our collector, and a beautiful variety of layer opal obtained. Flashes of rainbow softened by clouded effects, together with swift alterations of marvelous color, are shown in these charming specimens. They are sometimes used as rough mounts in jewelry. The color is in zones or layers and shows best when polished in the plane of color. $.50 to $6.00.

Crystallized Opal (pseudomorphous.) This new and rare form of Opal occurs of gem quality in spherical nodules, whose surface consists of crystals of four-sided pyramids, suggesting the orthorhombic nature of the original mineral. $8.00 to $20.00.

Precious Opalized Wood. Cracks and fissures of white petrified wood are filled with veins of sparkling Opal, an occurrence not noticed before. $.50 to $2.00.

Opalized Shells. Showing gem color when polished. $.50 to $4.00.

Precious "Matrix" Opal, Bulla Creek District, Queensland. An exquisite play of delicate colors, or perhaps bold and striking flashes of varied lights, have won a reputation for this stone among all others. The prominent colors are green and blue, often with red and violet spread over a broad surface of brown jaspery limonite matrix which affords a sombre but excellent background. These mines have long produced the larger part of the world's supply. The best pieces range from 2 to 5 cm. diameter and are priced at $.50 to $10.00.

Bismutite. An alteration product of Bismuthinite. Typical examples. $.75 to $6.00.

Star Sapphire, Anakie, Queensland. A small lot of especially selected specimens, exhibiting a six-rayed star on the basal cleavage. They are deep blue, of hexagonal form, and somewhat water-worn. Highly polished crystals. $1.00 to $5.00.

Rough crystals. $.50 to $3.00.

Newberyite, Skipton Caves, Victoria. An insoluble, hydrous phosphate of magnesium, occurring in irregular aggregations of bright orthorhombic crystals. $.25 to $2.00.

Chabazite var. Phacolite, near Melbourne. Occurs in "composite twins of great variety and beauty" (Dana). Crystals varying from 5 to 12 mm. are scattered attractively over a dull black basalt. It is safe to say that no one of the beautiful Zeolite minerals is handsomer than this, the clear-cut brilliant white to colorless hexagonal twins being well displayed against the dark background. Also some rare compound penetration twinnings. $.50 to $4.00.

Phillipsite. Colorless and often transparent crystals on dark basalt. Three types of perfect crystals. 1. The simple twin (Dana, Fig. 1) is uncommon; 2. Cruciform twin (Fig. 2) is the usual type; 3. More rarely a composite form (Fig. 4), which is a combination of

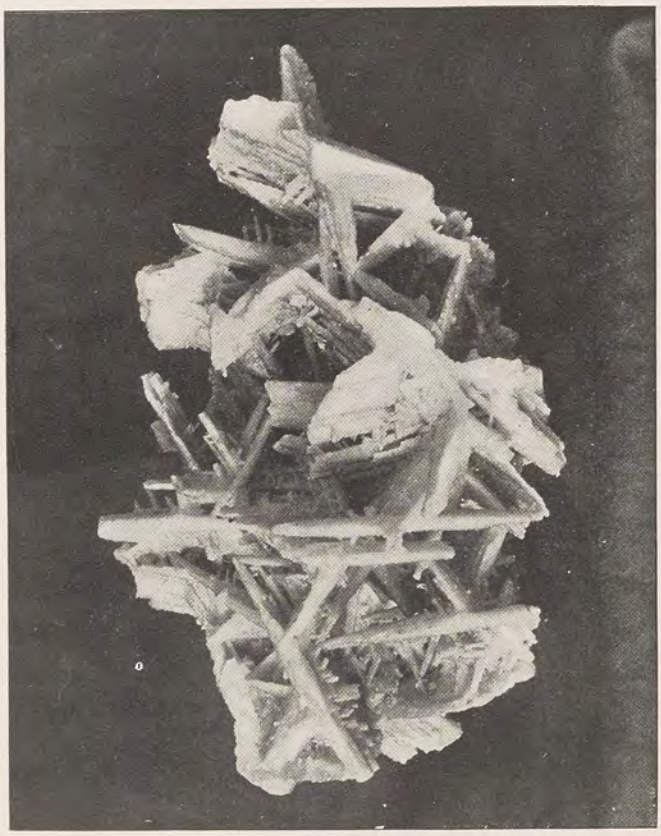


PLATE XXVI.

ANGLESITE COATING CERUSSITE.

BROKEN HILL, NEW SOUTH WALES.

PLATE XXVII.

METEORIC IRON WITH SCHREIBERSITE FIGURES.
TOMBIGBEE RIVER, ALABAMA.

three cruciform twins, suggestive of the Cumengéite trillings. They constitute the best representatives known of the species. $.50 to $3.00.

Aragonite. White acicular crystals attractively grouped on basalt. $.30 to $1.50.

Ferrocalcite. A unique variety of Calcite occurring in brown tufts of acicular crystals. Some groups are daintily sprinkled with globules and tufts of snowy Mesolite. $.30 to $2.00.

Gmelinite, Flinders, Victoria. Exceptionally choice examples. Crystals are six-sided twins, flesh-red color and 5 to 15 mm. diameter. Some are exceedingly sharp and brilliant. $.75 to $4.00.

Mesolite. Pretty specimens consisting of globules and snow-white tufts coating the trap rock. $.40 to $1.50.

Analcite. In brilliant limpid crystals, lining cavities of the trap. $.40 to $2.00.

Crocoite. (Plate XIV., p. 72.) From the long closed Adelaide Mine, Dundas, Tasmania. The wealth of crystal forms of this great find have been studied and described at some length by Palache, Van Name and others. One author says of crystals obtained of us, "With their superb color, high lustre and remarkably perfect crystallization, they are most beautiful natural objects, scarcely surpassed by crystals of any other known mineral." The discovery of new forms of this wonderful mineral is the result of over a year's work of our collector, in which the old Siberian specimens were totally outclassed. The various Tasmanian mines yielding the Chromate of Lead, have been abandoned for some years and offered no hope for specimens in the future, the water in the levels having ruined all the specimens in the porous rock. The surface indications at the Adelaide appeared to warrant operations, and a tunnel was driven into the hill above. After much expensive labor a number of fine, rich colored crystals on dark gangue were found, and a good supply of pure massive Crocoite saved. Further on, however, in a clayey deposit, our collector was fortunate enough to strike a small patch of loose prisms 3 to 9 cm. long, superbly terminated, and of a most gorgeous translucent to transparent scarlet-red. The planes are exceptionally brilliant, and the angles of ideal sharpness and perfection. The crystals show various types of terminations, from a single face (the clinodome *z*), to six or seven terminal planes. Only a few perfect crystals were saved as compared with the number of broken, but otherwise choice crystals. Following this great strike, several months of fruitless and expensive tunneling forced an abandonment of the work, at a depth of 232 feet, closing the most extensive mining ever done solely for scientific mineral specimens.

The consensus of enthusiastic expression everywhere heard, is that the new Crocoites are not only incomparably superior to former finds, but that they belong in the first rank of natural crystallizations. It was even remarked of these unexpected marvels of form and color, that they seemed almost artificial!

Several museums and private collectors immediately acquired series of 15 to 20 specimens, while others limited their representation to a half dozen of the more prominent types. With the rise in quality came a two-thirds drop in price. The following types are representative:

a. *Grouped Crystals* of all types and one to five centimeters long, are found on geodic and irregular masses of brown to black Limonite. Scarlet needles are exquisitely defined in bridging singly or in a network, the dark cavities of the matrix. Large heavy prisms, often duller than the needles, are not uncommon. With rare exceptions the terminated crystals on the matrix measure only a few millimeters in diameter and up to one or two centimeters in length. The acute rhombic outlines, familiar in the old Siberian crystals, are common among the Tasmanian. These latter are always terminated at one or both ends. A few pure masses of interlacing crystals show gorgeous color with occasionally a touch of the yellow Massicot. 2 cm. to 20 cm. across. $.50 to $15.00.

b. *Loose Terminated Crystals.* Slender scarlet-red crystals of varying terminal habits, impossible to treat justly in a photo-engraving. They are extremely brilliant and usually translucent to transparent. The unit prism is the predominant form, being quite regular and abnormally elongated. One or both domes are generally prominently developed and of mirror-like lustre (illustrated on page 72, Part I.). We still have on sale a few crystals showing the new clinodome *j*. (Van Name, A. J. S., Vol. XIII.). 2 to 5 mm. thick and 3 to 8 cm. long. $.50 to $10.00.

c. *Loose Broken Prisms.* These were found in comparative abundance and are sold at about one-eighth the prices of terminated crystals, which they equal in all respects save the broken ends. In addition, however, are rougher short prisms of 1 to 2 cm. thickness. $.50 per dozen to $1.50 each.

d. *Laboratory Material.* Pure fragments of crystals, red, at $3.00 per kilogram.

Massicot, near Dundas. Found sparingly in amorphous masses and as a pulverulent coating on Anglesite. Dull sulphur-yellow color. $1.00 to $5.00.

Anglesite. Groups of fine adamantine crystals in well-defined habits of good size and perfection. $.50 to $4.00.

Cerussite. Solid reticulated masses of satiny-white prismatic crystals, making handsome examples of a familiar type. $.50 to $6.00.

Axinite. Occurs in a new and brilliant habit, the crystal edges being highly modified. Quite a different type from the acute-edged European examples. Often imbedded in granular Datolite. $.25 to $2.00.

Stannite, Zeehan. Another Australian occurrence which was first made generally available through our efforts. The new locality for this species yields specimens with a bluish tinge and a darker shade than the Cornish. $.30 to $2.00.

Zaratite, Heazlewood. Translucent emerald green surface on dark matrix. A new locality for an uncommon species. $.30 to $1.50.

Sulvanite, near Burra, South Australia. Sulpho-vanadate of copper. A pyrite-like mineral intimately associated with other copper minerals, the mixture resembling a blue-black, granular Chalcocite. $.50 to $2.00.

Stibiotantalite, Greenbushes, West Australia. Tantalo-niobate of Antimony. Several recent visits by our traveller to the locality, permitted an extensive search for this rare and interesting new species. Much laborious washing and sorting of the tin sands, resulted in finding several ounces. From this we have sold to the leading museums and collectors. Our prices are less than half the wholesale figures at which we refused to buy one ounce of the mineral offered us a year ago by a correspondent near the locality. A few characteristic specimens of the pure mineral remain. Their identity has been confirmed by analysis. Some are associated with Tantalite. $2.00 to $10.00.

Tantalite. A new locality for the Tantalate of Iron. (Sp. gr. 7.6 to 7.8.) A century-old species which has been known in even the great collections by small and insignificant specimens. We have left a few authentic examples of good size. They are pure masses, occasionally showing distinct crystals. $1.00 to $6.00.

Cassiterite. In excellent loose crystals of bright and well defined twinned forms. $.20 to $1.00.

Calaverite, Kalgoorlie, West Australia. Gold Telluride. A visit to the locality secured some examples of the mineral in bright veins and patches in the typical rock. They are especially rich "show-samples" of an ore which has made the region famous. $1.00 to $8.00.

Coloradoite, Kalgoorlie. Mercury Telluride. Typical black specimens in the usual ore. Some associated with the lighter Calaverite. Each piece has been analyzed. $1.00 to $5.00.

METEORITES.

A list of other falls represented in our stock will be mailed on application. Correspondence is solicited with any one wishing to buy, sell or exchange.

Tombigbee River Meteoric Iron. Plate XXVII. (W. M. Foote in *Am. Jour. Sci., Aug., 1899. Note on a new Meteoric Iron found near the Tombigbee River in Choctaw and Sumpter Counties, Alabama, U. S. A.*) This meteorite is remarkable for the size and beauty of the rare

Schreibersite figures exhibited. These assume the curious and novel shape of vermiform and graphic characters, some of them terminating in angular crystallizations. A glistening frosted effect on the etched surface suggests a metallic sunstone. The illustration poorly represents the oddity and beauty of the specimen, yet indicate the unique features which establish for it a separate position among the siderites. Composition of the metallic portion: Iron, 95.02; Nickel, 4.11; Cobalt, .40; Phosphorus, .324; Carbon, .161; Sulphur trace; Total, 100.015.

The six masses, having a total weight of 43,795 grams, were found between 1859 and 1886.

The entire find was secured by us, although only a portion shows the Schreibersite figures. A few slabs and end pieces of the best quality remain on sale. One of these splendid examples of Schreibersite, a meteoric species rarely found in good specimens, should be in every large mineral collection.

Canon Diablo, Arizona, Diamondiferous Meteoric Iron. Plate XXVIII. Collected in '91 by Dr. A. E. Foote and analyzed by Prof. G. A. Koenig, who discovered diamonds in the iron. It contains about 90 per cent. iron, with varying amounts of nickel, cobalt, carbon, etc.

Dr. Foote called the attention of the scientific world to the discovery, in a paper read by him before a meeting of the American Association for the Advancement of Science, held in Washington, D. C., August 20, 1891. (*A New Locality for Meteoric Iron with a Preliminary Notice of the Discovery of Diamonds in the Iron.*) The announcement awakened much interest, which was reflected in both the popular and scientific journals, and more or less serious speculation was indulged in as to this new source of Diamonds.

The character of the iron led other eminent chemists and high authorities on meteorites, to investigate it, and prove the presence of Diamonds, irregularly disseminated throughout different specimens

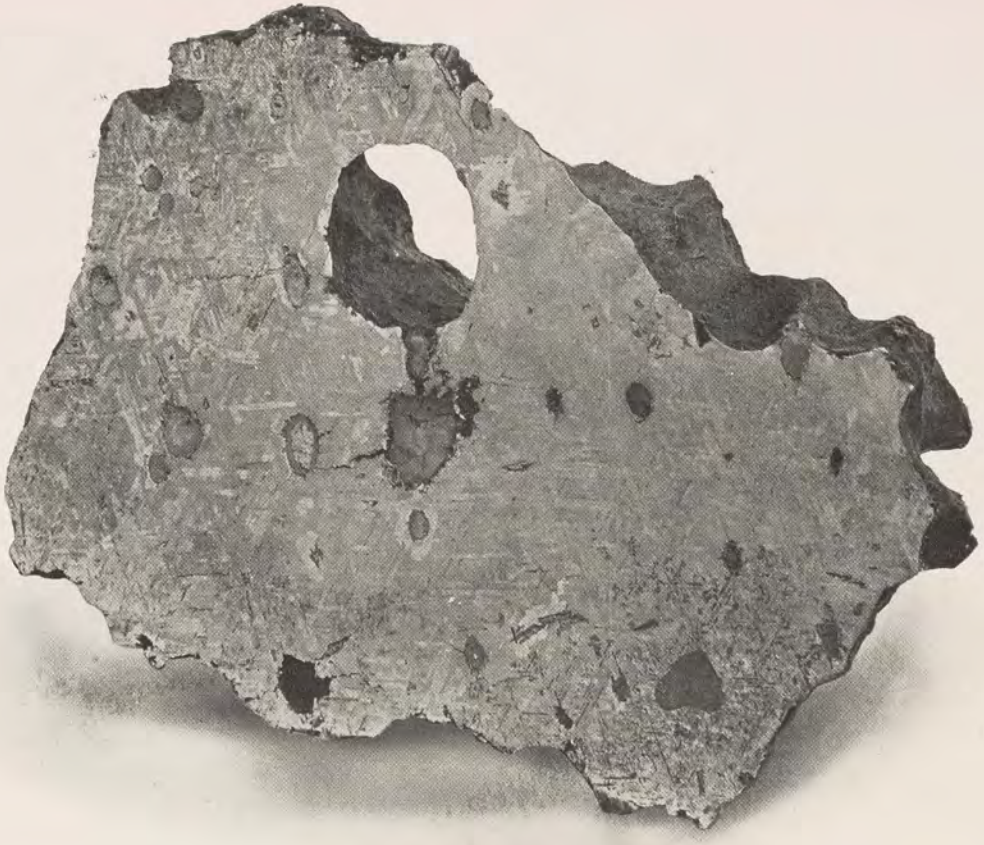


PLATE XXVIII.

DIAMONDIFEROUS METEORIC IRON. CANON DIABLO, ARIZONA. REDUCED 2/3.

PLATE XXIX.

METEORIC IRON, SACRAMENTO MTS., NEW MEXICO. WEIGHT, ENTIRE, 237 KILOS. NUMEROUS COMPLETE SECTIONS WERE SAWN FROM THE TOP AND BOTTOM. THE CENTRAL PORTION OUTLINED IS IN ONE PIECE, WEIGHING 81 KILOS.

examined. No Diamonds of any commercial value have been found; the white crystals were very minute, the larger ones being simply rough black Diamonds.

An interesting hypothesis was discussed by Prof. G. K. Gilbert concerning the origin of a non-volcanic crater, about three-quarter mile wide and 600 feet deep, formed in the center of the level plain, the iron having been found about this crater. Various facts were reviewed, suggesting that this depression in the earth's crust may have been caused by a colliding star of iron, about one-eighth mile diameter, the Limonite, so abundant near by, forming the oxidized portion.

We have masses similar to the one illustrated, at prices lower than asked for any other recorded fall. We have sawed two large masses into complete sections of 4 or 5 cm. thickness and 30 to 40 cm. breadth. Several large end pieces showing the pitting finely are on sale. This work was accomplished at almost prohibitive cost on account of the great hardness of the metal, due to the presence of the minute diamonds throughout the mass. A rare opportunity for museums or collectors to secure an object of great interest.

Limonite, the oxidized portion (?). Pieces 1½ to 4 in. $.50 to $2.00.

Sacramento Mountains (N. M.) Meteoric Iron. Plates XV. and XXIX. (*W. M. Foote, Am. Jour. Sci., Jan., 1897. Note on a New Meteorite from the Sacramento Mountains, Eddy County, New Mexico.*) This mass of iron is believed to be the meteor seen to fall at this place in 1876. No fragments could be found and the specimen appeared to be complete, weighing when found 237 kilos. The two ends are sawed off, leaving it 20 cm. high and forming a base about 25 x 8 cm., the top measuring about 65 x 14 cm. It has a level etched surface, showing a large Troilite nodule and the perfect crystallization of the iron (see Plate XV., p. 89). This characteristic octahedral crystallization is plainly exhibited on the fractured edges. A deep, round pit, 10 cm. in diameter, constitutes a curious feature. The exterior is covered with the peculiar "thumb-marks," common in meteoric irons.

Analysis of a metallic sample gave: Iron, 91.39; Nickel, 7.86; Cobalt, .52=99.77.

The main mass now weighs 81 kilos. Plate XXIX.

We offer slices of 25 grams each, up to complete sections of 6,500 grams. These are sawn from the top and are of uniform thickness. The larger ones exhibit several Troilite nodules and make magnificent museum specimens.

Terrestrial Iron, Disco Island, Greenland. Pieces of the mass found and originally described by Prof. Nordenskiold. They are typical examples of the only Terrestrial iron obtainable. $1.50 to $12.00.

Index to Dana's Classification and Price List of Single Specimens.

The numbers preceding the names refer to their order in Dana's Classification. Where "r" follows the name it is a sub-species, *related* to or near the species, the number of which precedes the name; when followed by "v," it is a *variety;* followed by "s," a *synonym;* followed by "ap." a name in the group *appendix* following the number given. "H" designates *Hydrocarbons;* "N," minerals, generally *new*, described in the Supplement and Appendix.

Prices are quoted on minerals ordinarily in stock. Generally those not priced are exceedingly rare, and only a small proportion of them can be supplied. The prices given are for typical examples; the lowest for good study specimens, usually of the standard Student's size, 7 x 5 cm. (2¾ x 2 in.). The highest price generally refers to choice cabinet and large museum specimens. Small pieces may often be had at less than the minimum prices, and exceptional specimens may bring more than the maximum.

Many specimens are well crystallized and of attractive appearance, but a large proportion are only found in small crystals or masses. Preceding is an illustrated account describing "Choice Minerals" and "Meteorites." See also "Crystallography." Minerals sold by weight are priced in the "Laboratory List." Convenient and briefly descriptive is the "Price List of Individual Specimens of the Commoner Minerals, Including the Kinds Used in Elementary Study." See pp. 90-93, Part I.

744.	Abraum salts, r.,	$		$	138.	Aikinite, ...	$1.50	to $6.00
447.	Acadialite, v., . .	.25	to	1.50	248.	Ainalite, r., . . .		
57.	Acanthite, . . .	.75	"	4.00	H.	Ajkite		
819.	Achrematite, r., .				391.	Akermanite, r., .		
426.	Achroite, v., . . .	.50	"	2.50	63.	Alabandite, . . .	.40	" 3.00
366.	Achtaragdite, r., .				746.	Alabaster, v., . .	.10	" .40
326.	Acmite, ...	.25	"	1.00	325.	Alalite, v., ...	.40	" 1.50
338.	Actinolite, v., . .	.15	"	.75	118.	Alaskaite, s., . .	1.50	" 6.00
563.	Adamite, ...	.50	"	3.00	H.	Albertite, ...	.10	" .40
458.	Adamsite, v., . .				435.	Albine, v., ...	.20	" 1.00
N.	Adelite, ...				316.	Albite, ...	.10	" 1.50
524.	Adelpholite, r., .				242.	Alexandrite, v., .	.50	" 8.00
447.	Adipite, v., . . .				N.	Alexandrolite, . .		
313.	Adularia, v., . . .	.30	"	2.50	38.	Algodonite, . . .		
445.	Ædelforsite, v., .				483A.	Alipite, r., ...		
326.	Aegirite, s., . . .	.25	"	1.00	45.	Alisonite, r., . . .		
343.	Ænigmatite, . . .	1.00	"	5.00	578.	Allactite, ...	.50	" 2.00
532.	Æschynite, . . .	1.00	"	4.00	335.	Allagite, r., . . .		
458.	Agalmatolite, r., .	.20	"	1.00	409.	Allanite, ...	.20	" 1.00
270.	Agaric mineral, v.	.10	"	.50	9.	Allemontite, . . .	.20	" .75
210.	Agate, v., ...	.10	"	2.00	102.	Alloclasite, . . .	.75	" 3.00
210.	Agate-Jasper, v., .	.30	"	1.50	719.	Allomorphite, v.,		
306.	Agnesite, r., . . .				24.	Allopalladium, . .		
373.	Agricolite, ...				498.	Allophane, ...	.25	" 1.25
N.	Aguilarite, ...	1.00	"	10.00	509.	Allophite, ap., . .		

544.	Alluaudite, r., . .	$		$	
370.	Almandite, v., . .	.20	to	3.00	
510.	Alshedite, v., . .				
278.	Alstonite, s., . . .	.75	"	2.50	
46.	Altaite, ...	1.00	"	4.00	
769.	Alum, Iron, s., .	.25	"	1.00	
764.	" Native, s., .	.20	"	1.00	
	Alums, 764-770, . .				
736.	Alumian, ...				
791.	Aluminite, ...	.20	"	.75	
212.	Alumocalcite, v., .				
800.	Alumstone, s., . .	.10	"	.75	
800.	Alunite, ...	.10	"	.75	
775.	Alunogen, ...	.15	"	.50	
462B.	Alurgite, r., . . .				
394.	Alvite, r., ...	.50	"	2.00	
17.	Amalgam, ...	.75	"	3.00	
13.	" Gold, r.,				
17.	" Silver, s.	.75	"	3.00	
787.	Amarantite, . . .	.75	"	4.00	
315.	Amazonite, v., . .	.25	"	7.00	
315.	Amazon stone, v.,	.25	"	7.00	
H.	Amber, Succinite,	.50	"	3.00	
559.	Amblygonite, . .	.20	"	.75	
324.	Amblystegite, v.,				
H.	Ambrite, ...	.20	"	1.00	
H.	Ambrosine, . . .				
470.	Amesite, r., . . .				
210.	Amethyst, v., . .	.30	"	7.00	
338.	Amianthus, s. v., .	.20	"	.75	
675.	Ammiolite, r., . .				
338.	Amphibole, . . .	.10	"	7.00	
611.	Amphithalite, r., .				
450.	Analcite, ...	.40	"	2.00	
252.	Anatase, s., . . .	.50	"	2.50	
398.	Andalusite, ...	.20	"	1.50	
318.	Andesine, ...	.10	"	.50	
318.	Andesite, s., . . .	.10	"	.50	
N.	Andorite				
370.	Andradite, v., . .	.20	"	1.50	
656.	Andrewsite, r., .				
721.	Anglesite, ...	.50	"	10.00	
722.	Anhydrite, ...	.10	"	.75	
35.	Animikite, r., . .				
271A.	Ankerite, ...	.40	"	2.50	
602.	Annabergite, . . .	.35	"	1.50	
530.	Annerödite, . . .	.75	"	4.00	
462B.	Annite, s., ...	.30	"	1.25	
462.	Anomite, v., . . .				
320.	Anorthite, ...	.30	"	1.25	
315A.	Anorthoclase, . .				
325.	Anthochroite, v.,				
337.	Anthophyllite, . .	.10	"	.75	
505.	Anthosiderite, r.,				
H.	Anthracite, . . .	.10	"	.40	
H.	Anthracoxenite, .				
H.	Anthraxolite, . .				
481.	Antigorite, v., . .				
509.	Antillite, ap., . .				
9.	Antimonial Arsenic, r.,	$		$	
221.	Antimonial Ocher, s.,	.20	to	.75	
144.	" Red Silver, s.,	.50	"	6.00	
10.	Antimony, ...	.40	"	2.00	
9.	" Arsenical, s.,	.20	"	.75	
28.	" Glance, s., .	.20	"	10.00	
741.	Antlerite, r., . . .				
175.	Antozonite, v., .				
455.	Antrimolite, v., .				
789.	Apatelite, r., . . .	.25	"	1.00	
549.	Apatite, ...	.10	"	3.00	
270.	Aphrite, v., . . .				
426.	Aphrizite, v., . .				
481.	Aphrodite, r., . .	.35	"	1.50	
477.	Aphrosiderite, . .				
717.	Aphthitalite, . . .	.75	"	4.00	
770.	Apjohnite, ...				
370.	Aplome, v., . . .	.50	"	2.00	
435.	Apophyllite, . . .	.40	"	6.00	
509.	Aquacreptite, ap.,	.20	"	.75	
344.	Aquamarine, v., .	.40	"	2.50	
223.	Aqueous Vapor, s.,				
277.	Aragonite, ...	.50	"	8.00	
H.	Aragotite, ...				
717.	Arcanite, r., . . .				
509.	Arctolite, ap., . .				
418.	Ardennite, ...				
675.	Arequipite, r., . .				
342.	Arfvedsonite, . .	.50	"	2.00	
45.	Argentiferous Galena, v., ...	.50	"	3.00	
270.	Argentine, v., . .	.15	"	.75	
42.	Argentite, ...	.40	"	8.00	
56.	Argentopyrite, r.,				
163.	Argyrodite, . . .	2.00	"	12.00	
56.	Argyropyrite, r., .				
253.	Arkansite, v., . .	.40	"	3.50	
780A.	Arnimite, ...				
768.	Aromite, r., . . .				
17.	Arquerite, v., . .	.75	"	3.00	
535.	Arrhenite, ap., .				
35.	Arsenargentite, r.				
8.	Arsenic., ...	.40	"	4.00	
9.	" Antimonial, r.				
213.	" White, s., . .				
87.	Arsenical Cobalt, s.,	.50	"	3.00	
71.	" Nickel, s.,	.40	"	3.00	
98.	" Pyrites, s.	.10	"	1.50	
145.	" Red Silver, s.,	.50	"	8.00	
35.	" Silver, r.,				
582.	Arseniopleite, . .				
577.	Arseniosiderite, .	.35	"	1.50	
8.	Arsenolamprite, r.,				
213.	Arsenolite, . .				
98.	Arsenopyrite, . .	.10	"	1.50	
108.	Arsenotellurite, ap.,				
338.	Asbeferrite, v., .				
338.	Asbestus, v., . . .	.15	"	.75	

481.	Asbestus, v., . . .	$ .15	to $	.75
210.	Asbestus in Quartz, v., . . .	.50	"	3.00
269.	Asbolite, r., . . .	.20	"	.75
N.	Ascharite, ...			
211.	Asmanite, r., . .			
549.	Asparagus-stone, v.,	.50	"	2.00
504.	Asperolite, v.,. .			
H.	Asphaltum, . . .	.10	"	.40
462A.	Aspidolite, r., . .			
210.	Asteriated Quartz, s. v.,			
231.	" Sapphire, s.,	.50	"	3.00
325.	Asteroite, v., . .			
N.	Astochite, ...	.50	"	2.00
758.	Astrakanite, v., .	.20	"	1.50
514.	Astrophyllite, . .	.20	"	1.50
193.	Atacamite, ...	.30	"	4.00
584.	Atelestite, ...	1.00	"	5.00
193.	Atelite, r., ...			
389.	Atheriastite, r., .			
289.	Atlasite, r., . . .			
669.	Atopite, ...			
645.	Attacolite, r., . .			
394.	Auerbachite, r., .			
395.	Auerlite, r., . . .			
645.	Augelite, r., . . .			
325.	Augite, v., ...	.30	"	4.00
353.	Auralite, r., . . .			
290.	Aurichalcite, . . .	.20	"	2.00
236.	Automolite, v.,. .	.50	"	2.00
661.	Autunite, ...	.50	"	3.00
458.	Avalite, v., ...	.50	"	2.50
506.	Avasite, r., ...			
	Aventurine Feldspar, v. of 316 and 317, ...	.75	"	4.00
210.	Aventurine Quartz, v., ...	.75	"	2.00
25.	Awaruite, v., . .			
410.	Axinite, ...	.25	"	7.00
394.	Azorite, v., . . .			
289.	Azurite, ...	.50	"	6.00
210.	Babel-quartz, v., .	.40	"	1.50
336.	Babingtonite, . .	1.50	"	8.00
N.	Baddeckite, . . .			
N.	Baddeleyite, . . .			
409.	Bagrationite, v., .			
325.	Baikalite, v., . . .			
H.	Baikerinite, . . .			
234.	Balas Ruby, s. v.,	.25	"	1.00
479.	Baltimorite, r., .	.15	"	.75
509.	Balvraidite, ap., .			
399.	Bamlite, v., . . .			
210.	Banded Agate, v.,	.15	"	3.00
675.	Barcenite, r., . .	.75	"	3.00
509.	Barettite, ap., . .			
270.	Baricalcite, v., . .			
719.	Barite, ...	$ .10	to $	6.00
342A.	Barkevikite, . . .			
83.	Barnhardtite, r., .	.25	"	1.00
N.	Barracanite, . . .			
610.	Barrandite, . . .			
320.	Barsowite, r., . .			
801.	Bartholomite, r., .			
430.	Barylite, ap., . .			
354.	Barysilite, ...			
462.	Barytbiotite, v., .			
719.	Barytes, s., . . .	.10	"	6.00
282.	Barytocalcite, . .	.40	"	1.50
720.	Barytocelestite, v.,			
210.	Basanite, v., . . .	.15	"	.50
233.	Basanomelan, v., .			
324.	Bastite, r., ...	.25	"	1.25
285.	Bastnäsite, . . .	.75	"	3.00
462.	Bastonite, r., . .			
H.	Bathvillite, . . .			
374.	Batrachite, v., . .			
261.	Bauxite, ...	.10	"	.40
629.	Bayldonite, . . .			
N.	Beaconite, ...			
394.	Beccarite, v., . .			
709.	Bechilite, ...			
155.	Beegerite, ...			
210.	Beekite, v., . . .	.15	"	.75
820.	Belonesite, ...			
507.	Bementite, ...	.75	"	4.00
648.	Beraunite, ...	.40	"	1.50
H.	Berengelite, . . .			
N.	Beresovite, . . .			
338.	Bergamaskite, v.,			
453.	Bergmannite, v., .			
479.	Berlauite, r., . . .			
645.	Berlinite, r., . . .			
269.	Bernonite, ap., .			
473.	Berthierine, r., .			
119.	Berthierite, . . .	.75	"	3.00
422.	Bertrandite, . . .	1.00	"	6.00
344.	Beryl, ...	.10	"	3.00
546.	Beryllonite, . . .	.40	"	1.50
49.	Berzelianite, . . .	1.50	"	7.00
538.	Berzeliite, ...	.75	"	4.00
680.	Beudantite, . . .	.40	"	1.50
407.	Beustite, v., . . .			
76.	Beyrichite, . . .			
509.	Bhreckite, ap., . .			
754.	Bieberite, ...			
H.	Bielzite, ...			
497.	Biharite, r., . . .			
670.	Bindheimite, . . .	.50	"	3.00
123.	Binnite, ...	1.50	"	8.00
320.	Biotine, v., ...			
462.	Biotite, ...	.10	"	1.00
270.	Bird's-eye Marble, v., ...	.20	"	.75
197.	Bischofite, ...	.25	"	1.00
217.	Bismite, ...	1.00	"	4.00

11.	Bismuth, ...	$ .50	to	$3.00
13.	Bismuth-gold, v.,			
29.	Bismuthinite, . .	.50	"	2.00
217.	Bismuth Ocher, s.,	1.00	"	4.00
306.	Bismutite, ...	.75	"	6.00
430.	Bismutoferrite, ap.			
N.	Bismutosmaltite,.			
283.	Bismutosphärite,.			
H.	Bitumen, s. Elaterite, ...	.15	"	.50
H.	Bituminous Coal,	.10	"	.40
N.	Bixbyite, ...			
230.	Black Copper, s., .	.40	"	1.50
338.	" Hornblende, v.	.10	"	3.00
58.	" Jack, s., . .	.10	"	8.00
2.	Black Lead, s., . .	.15	"	.75
270.	" Marble, v., .	.10	"	.40
462.	" Mica, s., . .	.10	"	1.00
210.	" Tourmaline in Quartz, v.,	.20	"	8.00
45.	Bleischweif, v., .			
58.	Blende, s., ...	.10	"	8.00
N.	Bliabergsite, . .			
758.	Blödite, ...	.20	"	1.50
535.	Blomstrandite, ap.			
210.	Blood-stone, v., .	.25	"	2.00
597.	Blue Iron Earth, s.,	.50	"	2.00
N.	Blueite, ...			
755.	Blue Vitriol, s., .	.30	"	1.50
599.	Bobierrite, ...			
409.	Bodenite, r., . . .			
269.	Bog Manganese, r.,	.20	"	1.00
259.	" Ore, v., . . .	.10	"	.40
493.	Bole, v., ...	.10	"	.50
N.	Boléite, ...	.20	"	3.00
108.	Bolivianite, ap., .			
29.	Bolivite, r., . . .			
719.	Bologna Stone, v.,	.20	"	1.00
375.	Boltonite, v., . .	.20	"	.75
H.	Bombiccite, . . .	.40	"	2.00
698.	Boracite, ...	.20	"	2.50
707.	Borax, ...	.20	"	.75
169.	Bordosite, r., . .			
265.	Boric Acid, s., . .			
653.	Borickite, ...			
78.	Bornite, ...	.30	"	5.00
708.	Boronatrocalcite, s.	.30	"	1.50
1.	Bort, v., ...	.50	"	8.00
798.	Botryogen, . . .			
401.	Botryolite, v., . .	.40	"	1.50
139.	Boulangerite, . .	.50	"	2.00
751.	Bourbolite, r., . .			
136.	Bournonite, . . .	.50	"	4.00
759.	Boussingaultite, .			
481.	Bowenite, v., . .			
566.	Brackebuschite, .	.50	"	2.50
465.	Brandisite, v., . .	.40	"	2.50
591.	Brandtite, ...	.75	"	3.00
247.	Braunite, ...	.40	"	1.50
509.	Bravaisite, ap., . .	$		$
N.	Brazilite, ...			
270.	Breccia Marble, v.,	.20	to	.75
338.	Breislakite, v., . .	.40	"	2.00
72.	Breithauptite, . .	.75	"	2.50
272.	Breunnerite, s., .	.10	"	1.00
439.	Brewsterite, . . .	.75	"	3.00
3.	Brimstone, s., . .	.20	"	6.00
153.	Brittle Silver, s., .	.75	"	6.00
740.	Brochantite, . . .	.40	"	2.00
711.	Bröggerite, v., . .	1.00	"	8.00
278.	Bromlite, ...	.75	"	2.50
171.	Bromyrite, ...	1.50	"	7.00
132.	Brongniardite, . .			
323.	Bronzite, v., . . .	.15	"	.50
253.	Brookite, ...	.40	"	3.00
259.	Brown Clay-ironstone, v., ...	.10	"	.40
H.	Brown Coal, . . .	.10	"	.40
259.	Brown Hematite, s., ...	.10	"	.75
257.	Brown Iron-ore, s.,	.25	"	1.50
259.	Brown Iron-stone, s.	.10	"	.75
271.	Brown Spar, s., .	.10	"	4.00
262.	Brucite, ...	.30	"	2.00
H.	Brücknerellite, .			
175.	Bruiachite, r., . .			
270.	Brunnerite, v., .			
618.	Brushite, ...			
H.	Bucaramangite, .			
409.	Bucklandite, v., .			
210.	Buhrstone, v., . .	.10	"	.40
227.	Bunsenite, ...			
770.	Bushmanite, r., .			
173.	Bustamentite, r.,			
335.	Bustamite, v., . .			
H.	Byerite, ...			
338.	Byssolite, v., . . .	.10	"	.75
603.	Cabrerite, ...			
212.	Cacholong, v., . .	.25	"	1.50
392.	Cacoclasite, r., . .	.25	"	2.00
647.	Cacoxenite, ...	.40	"	2.00
210.	Cairngorm Stone, s.,	.10	"	3.00
H.	Caking (coking) Coal, ...	.10	"	.40
423.	Calamine, ...	.25	"	4.00
105.	Calaverite, r., . .	1.00	"	15.00
719.	Calcareobarite, v.,			
270.	Calcareous Marl, v.,	.10	"	.50
720.	Calciocelestite, v.,			
652.	Calcioferrite, . . .			
395.	Calciothorite, r.,			
565.	Calciovolborthite,			
270.	Calcite, ...	.10	"	9.00
228.	Calcozincite, v., .	.40	"	3.00
270.	Calc Spar, s., . .	.10	"	9.00
270.	Calc Tufa, v., . .	.10	"	.40
370.	Calderite, v., . .			

739.	Caledonite,	$ .75	to	$3.00
612.	Callainite,			
164.	Calomel,	2.00	"	9.00
719.	Calstronbarite, v.,			
551.	Campylite, v.,	.50	"	3.00
325.	Canaanite, v.,			
360.	Cancrinite,	.30	"	1.00
N.	Canfieldite,			
H.	Cannel Coal,	.10	"	.40
67.	Cantonite, r.,			
445.	Caporcianite, v.,			
210.	Capped Quartz, v.,	.50	"	2.50
347.	Cappelenite,			
729.	Caracolite,			
1.	Carbonado, v.,	2.00	"	10.00
541.	Carminite,			
201.	Carnallite,	.15	"	.50
210.	Carnelian, v.,	.10	"	.75
N.	Carnotite,	.75	"	4.00
498.	Carolathine, r.,	.40	"	1.50
424.	Carpholite,	.40	"	2.00
790.	Carphosiderite,	.50	"	2.00
82.	Carrollite,			
540.	Caryinite,	.50	"	2.50
349.	Caryocerite,			
508.	Caryopilite,	.40	"	1.50
248.	Cassiterite,	.10	"	3.00
783.	Castanite,			
510.	Castellite, r.,			
78.	Castillite, r.,			
310.	Castorite, v.,	.50	"	2.00
N.	Cataphorite,			
346.	Catapleiite,	.50	"	2.00
458.	Cataspilite, r.,	.15	"	.50
500.	Catlinite, ap.,	.10	"	.40
210.	Cat's-Eye, v.,	.50	"	2.50
242.	Cat's-Eye, v.,	1.00	"	5.00
210.	Cavernous Quartz, v.,	.25	"	1.50
361.	Cavolinite, r.,	.25	"	1.00
489.	Celadonite,	.20	"	.75
720.	Celestite,	.10	"	6.00
719.	Celestobarite, v.,			
N.	Celsian,			
501.	Cenosite,	1.50	"	7.00
435.	Centrallassite, r.,			
169.	Cerargyrite,	.40	"	6.00
353.	Cerasite, v.,			
425.	Cerite,	.50	"	2.00
481.	Cerolite, r.,			
281.	Cerussite,	.30	"	12.00
221.	Cervantite,	20	"	.75
234.	Ceylonite, v.,	.30	"	1.50
447.	Chabazite,	.25	"	4.00
755.	Chalcanthite,	.30	"	1.50
210.	Chalcedony, v.,	.20	"	1.50
54.	Chalcocite,	.30	"	6.00
474.	Chalcodite, v.,	.25	"	1.25
811.	Chalcomenite,			
435.	Chalcomorphite, r.,	$		$
268.	Chalcophanite,	.20	"	1.00
636.	Chalcophyllite,	.75	"	5.00
83.	Chalcopyrite,	.20	"	3.00
81.	Chalcopyrrhotite, r,			
656.	Chalcosiderite,	.50	"	3.00
117.	Chalcostibite,			
224.	Chalcotrichite, v.,	.30	"	2.00
456.	Chalilite, v.,			
270.	Chalk, v.,	.10	"	.40
484.	" French, v.,	.10	"	.40
273.	Chalybite, s.,	.10	"	3.00
25.	Chalypite, r.,			
473.	Chamosite, r.,	.25	"	1.00
H.	Chemawinite,			
655.	Chenevixite,			
550.	Cherokine, v.,			
210.	Chert, v.,	.10	"	.40
289.	Chessylite, s.,	.50	"	6.00
315.	Chesterlite, v.,	.20	"	.75
398.	Chiastolite, v.,	.40	"	1.50
649.	Childrenite,	.40	"	2.00
567.	Chileite, r.,			
.40	Chilenite,			
683.	Chile Saltpeter, s.,	.10	"	.40
492.	China Clay, s.,	.10	"	.40
184.	Chiolite,	.50	"	2.50
111.	Chiviatite,			
323.	Chladnite, v.,			
88.	Chloanthite,	.50	"	4.00
179.	Chloralluminite, r.,			
549.	Chlor-apatite, v.,			
457.	Chlorastrolite, ap.,	.25	"	3.00
	Chlorite Group, 468-479,			
210.	Chloritic Quartz, v.,	.30	"	4.00
466.	Chloritoid,	.10	"	.40
176.	Chloromagnesite,			
328.	Chloromelanite, v.,			
505.	Chloropal,	.25	"	1.25
479.	Chlorophæite, r.,	.20	"	.75
353.	Chlorophyllite, r.,	.10	"	.50
234.	Chlorospinel, v.,			
729.	Chlorothionite, r.,			
712.	Chlorothorite, r.,			
596.	Chlorotile, r.,			
184.	Chodneffite, r.,			
572.	Chondrarsenite,			
415.	Chondrodite,	.30	"	5.00
N.	Chondrostibian,			
509.	Chonicrite, ap.,			
H.	Chrismatite,			
320.	Christianite, v.,			
58.	Christophite, v.,			
325.	Chrome-diopside, v.,			
500.	Chrome Ocher, ap.,	.50	"	2.00
462.	Chromglimmer, v.,			
241.	Chromic Iron, s.,	.10	"	.50
241.	Chromite,	.10	"	.50

370.	Chromium Garnet (s. Uvarovite), v.	$ .50	to	$2.00
241.	Chrompicotite, v.,			
242.	Chrysoberyl, . . .	.40	"	3.00
504.	Chrysocolla, . . .	.25	"	1.50
376.	Chrysolite, ...	.10	"	.50
210.	Chrysoprase, v., .	.50	"	2.50
481.	Chrysotile, v., . .	.25	"	1.50
606.	Churchite, ...			
495.	Cimolite, ...	.20	"	.75
66.	Cinnabar, ...	.40	"	7.00
370.	Cinnamon-stone, v.,	.20	"	5.00
676.	Ciplyte, r., ...			
576.	Cirrolite, ...			
210.	Citrine (Yellow Quartz), v., . .	.40	"	1.50
158.	Clarite, r., ...			
215.	Claudetite, ...			
47.	Clausthalite, . . .	.75	"	3.00
232.	Clay Iron-stone, v.,	.10	"	.40
149.	Clayite, r., ...			
316.	Cleavelandite, v., .	.10	"	.40
58.	Cleiophane, v., . .	.20	"	.75
711.	Cleveite, v., . . .	1.00	"	5.00
1.	Cliftonite, r., . .			
468.	Clinochlore, . . .	.20	"	2.00
571.	Clinoclasite, . . .	.50	"	2.00
801.	Clinocrocite, r., .			
N.	Clinohedrite, . . .			
416.	Clinohumite, . . .			
801.	Clinophæite, r., .			
N.	Clinozoisite, . . .	.50	"	3.00
465.	Clintonite, v., . .	.40	"	2.00
H.	Cloustonite, . . .			
450.	Cluthalite, r., . .			
H.	Coal, Anthracite,	.10	"	.40
H.	" Bituminous,	.10	"	.40
H.	" Brown, . . .	.10	"	.40
H.	" Caking, . . .	.10	"	.40
H.	" Cannel, . . .	.10	"	.40
H.	" Mineral, . .	.10	"	.40
H.	" Non-Caking,	.10	"	.40
601.	Cobalt Bloom, s., .	.50	"	3.00
89.	" Glance, s., .	.30	"	5.00
89.	Cobaltite, ...	.30	"	5.00
811.	Cobaltomenite, r.,			
79.	Cobalt Pyrites, s.,	1.00	"	4.00
173.	Coccinite, r., . . .			
325.	Coccolite, v., . . .	.10	"	.40
96.	Cockscomb Pyrites, v., ...	.20	"	2.50
645.	Cœruleolactite, r.,	.20	"	.75
704.	Colemanite, . . .	.50	"	7.00
586.	Collophanite, . .			
499.	Collyrite, ...			
370.	Colophonite, v., .	.20	"	.75
62.	Coloradoite, . . .	1.00	"	5.00
525.	Columbite, ...	.30	"	8.00
212.	Common Opal., v.,	.25	"	4.00
37.	Condurrite, v., . .	$1.00	to	$5.00
628.	Conichalcite, . . .	.50	"	3.00
486.	Connarite, ...			
731.	Connellite, . . .	1.00	"	4.00
460.	Cookeite, r., . . .	.20	"	.75
H.	Copalite, ...	.20	"	.75
H.	Copalite cont. insects, ...	.40	"	2.00
784.	Copiapite, ...	.30	"	2.00
15.	Copper, ...	.10	"	1.50
108.	Copper and Silver Sulphide, ap., .			
751.	Copperas, s., . . .	.30	"	1.25
54.	Copper Glance, s.,	.30	"	6.00
504.	Copper Pitch-blende, v., . . .			
83.	Copper Pyrites, s.,	.20	"	3.00
659.	Copper-Uranite, s.,	.10	"	4.00
772.	Coquimbite, . . .	.30	"	1.50
711.	Coracite, r., . . .			
353.	Cordierite, s., . .	.50	"	3.00
634.	Cornwallite, . . .			
675.	Coronguite, r., . .			
470.	Corundophilite, .	.25	"	1.00
231.	Corundum, ...	.10	"	6.00
91.	Corynite, ...	.75	"	2.50
128.	Cosalite, ...	.75	"	3.00
N.	Cosmochlore, . .			
459.	Cossaite, v., . . .			
343.	Cossyrite, v., . .			
180.	Cotunnite, ...	.40	"	2.00
388.	Couseranite, v., .	.20	"	.75
67.	Covellite, ...	.50	"	3.50
245.	Crednerite, ...			
233.	Crichtonite, v., . .			
211.	Christobalite, r., .			
341.	Crocidolite, . . .	.20	"	1.00
725.	Crocoisite, s., . .	.50	"	25.00
725.	Crocoite, ...	.50	"	25.00
472.	Cronstedtite, . . .	.75	"	4.00
53.	Crookesite, ...	1.50	"	8.00
N.	Crossite, ...			
98.	Crucite, r., ...			
183.	Cryolite, ...	.15	"	4.00
461.	Cryophyllite, v., .	.50	"	2.00
553.	Cryphiolite, r., . .			
185.	Cryptohalite, r., .			
708.	Cryptomorphite, r.,			
N.	Cryptovalite, . . .			
N.	Cubaite, ...			
N.	Cubeite, ...			
480.	Culsageeite, v., .			
N.	Cumengéite, v., . .	.50	"	4.00
338.	Cummingtonite, v.,	.20	"	.75
14.	Cupriferous Silver, v., ...			
224.	Cuprite, ...	.20	"	3.00
549.	Cupro-apatite, v.,			
112.	Cuprobismutite, .			

		$		$
N.	Cuprocassiterite, .			
564.	Cuprodescloizite, v.,	.25	to	1.50
N.	Cuproiodargyrite,			
754.	Cupromagnesite, r.,			
45.	Cuproplumbite, r.,			
815.	Cuprotungstite, .			
413.	Cuspidine, ...			
400.	Cyanite, ...	.20	"	15.00
504.	Cyanochalcite, v.,			
761.	Cyanochroite, . .			
781.	Cyanotrichite, . .	.75	"	3.00
N.	Cylindrite, ...	.50	"	2.50
327.	Cymatolite, r., . .	.25	"	1.00
393.	Cyprine, v., . . .	.30	"	1.25
795.	Cyprusite, ...			
394.	Cyrtolite, r., . . .	.40	"	1.50
676.	Dahllite, ...	.50	"	2.50
57.	Daleminzite, r., .			
458.	Damourite, v., . .	.20	"	.75
98.	Danaite, v., . . .			
367.	Danalite,.			
396.	Danburite, ...	.50	"	3.00
338.	Dannemorite, v., .			
471.	Daphnite, ...			
689.	Darapskite, . . .			
401.	Datolite, ...	.20	"	1.50
194.	Daubréeite, . . .			
80.	Daubreelite, . . .			
344.	Davidsonite, v., .			
190.	Daviesite, ...			
509.	Davreuxite, ap., .			
361.	Davyne, r., ...	.30	"	1.50
293.	Dawsonite, ...	.75	"	3.00
564.	Dechenite, r., . .			
506.	Degeröite, v., . .			
269.	Delafossite, ap., .			
648.	Delvauxite, r., . .			
478.	Delessite, ...	.20	"	.75
370.	Demantoid, v., . .			
504.	Demidovite, v., . .	.50	"	2.50
N.	Derbylite, ...			
509.	Dermatin, ap., . .			
483A.	De Saulesite, r., .	.75	"	3.00
564.	Descloizite, . . .	.25	"	2.00
443.	Desmine, s., . . .	.20	"	2.00
677.	Destinezite, v., . .	.30	"	2.00
482.	Deweylite, ...	.20	"	1.00
476.	Diabantite, ...	.20	"	.75
324.	Diaclasite, r., . .			
677.	Diadochite, ...	.30	"	1.50
325.	Diallage, v., . . .	.15	"	.75
274.	Diallogite, s., . .	.50	"	15.00
1.	Diamond, ...	.50	"	10.00
134.	Diaphorite, ...	1.50	"	7.00
256.	Diaspore, ...	.50	"	9.00
338.	Diastatite, v., . .			
	Diatomaceous Earth	.10	"	.40
588.	Dickinsonite, . . .			
458.	Didymite, v., . . .			
771.	Dietrichite, . . .			
569.	Dihydrite, ...			
716.	Dihydro-thenardite, r., ...			
504.	Dillenburgite, v., .			
499.	Dillnite, r., ...	.50	to	2.50
27.	Dimorphite, r., .			
H.	Dinite, ...			
325.	Diopside, v., . . .	.40	"	3.00
383.	Dioptase, ...	.50	"	8.00
388.	Dipyre, v., ...	.30	"	1.50
400.	Disthene, s., . . .	.20	"	15.00
585.	Dittmarite, r., . .			
112.	Dognacskaite, r., .			
270.	Dog-tooth Spar v.,	.15	"	6.00
738.	Dolerophanite, . .			
271.	Dolomite, ...	.10	"	2.00
37.	Domeykite,. . . .	.40	"	5.00
H.	Dopplerite,. . . .			
270.	Doubly Refracting Spar, s., ...	.30	"	4.00
200.	Douglasite, . . .			
719.	Dreelite, r., . . .	.50	"	2.00
210.	Drusy Quartz, v., .	.10	"	.40
83.	Ducktownite, r., .			
480.	Dudleyite, r., . .			
573.	Dufrenite, ...	.25	"	1.50
127.	Dufrenoysite, . .	1.00	"	6.00
479.	Dumasite, r., . .			
427.	Dumortierite, . .	.30	"	2.00
768.	Dumreicherite, r.,			
509.	Duporthite, ap., .			
558.	Durangite, ...	.40	"	1.50
810.	Durdenite, ...			
141.	Dürfeldtite, r., . .			
H.	Duxite, ...			
519.	Dysanalyte, . . .	.10	"	1.00
35.	Dyscrasite, ...	1.50	"	8.00
236.	Dysluite, v., . . .	.50	"	7.00
H.	Dysodile, ...			
335.	Dyssnite, r., . . .			
458.	Dysyntribite, r., .			
673.	Ecdemite, ...	.50	"	2.00
329.	Edelforsite, v., . .			
338.	Edenite, v., . . .	.10	"	.75
452.	Edingtonite, . . .	2.00	"	8.00
25.	Edmonsonite, r., .			
719.	Eggonite, r., . . .			
570.	Ehlite, r., ...			
500.	Ehrenbergit, ap., .			
262.	Eisenbrucite, r., .			
233.	Eisenrosen, v. (or v. 232), ...	.75	"	12.00
479.	Ekmannite, r., . .			
357.	Elæolite, v., . . .	.15	"	.75
H.	Elastic Bitumen,	.15	"	.50
H.	Elaterite, ...	.15	"	.50

13.	Electrum, v., . .	$1.00	to	$15.00
648.	Eleonorite, v., . .	.50	"	2.00
453.	Ellagite, r., . . .			
183.	Elpasolite, r., . .			
N.	Elpidite, ...	1.50	"	6.00
170.	Embolite, ...	.50	"	6.00
344.	Emerald, v., . . .	.50	"	3.00
303.	Emerald Nickel, s.,	.30	"	1.50
231.	Emery, v., ...	.10	"	.50
809.	Emmonsite, . . .			
116.	Emplectite, ...	.50	"	2.00
158.	Enargite, ...	.50	"	2.50
270.	Encrinal Marble, v.,	.10	"	.50
551.	Endlichite, r., . .	.30	"	2.00
323.	Enstatite, ...	.15	"	5.00
805.	Enysite, r., . . .			
819.	Eosite, r., ...			
650.	Eosphorite, . . .	1.50	"	6.00
509.	Ephesite, ap., . .			
161.	Epiboulangerite, .			
479.	Epichlorite, r., . .			
N.	Epididymite, . . .	.50	"	2.00
407.	Epidote, ...	.20	"	15.00
210.	Epidote in Quartz, v., ...	1.00	"	4.00
162.	Epigenite, ...			
379.	Epigenite, r., . .			
585.	Epiglaubite, r., .			
479.	Epiphanite, r., . .			
549.	Epiphosphorite, r.,			
457.	Episphärite, ap., .			
440.	Epistilbite, ...	1.00	"	6.00
748.	Epsomite, ...	.25	"	1.50
748.	Epsom Salt, s., .	.25	"	1.50
350.	Erdmannite, r., .			
402.	" r., .			
568.	Erinite, ...	.40	"	2.00
N.	Erionite, ...			
386.	Ersbyite, v., . . .			
78.	Erubescite, s., . .	.30	"	5.00
795.	Erusibite, r., . . .			
601.	Erythrite, ...	.50	"	3.00
193.	Erythrocalcite, r.,			
199.	Erythrosiderite, .			
69.	Erythrozincite, r.,			
407.	Escherite, v., . .			
370.	Essonite, v., . . .	.20	"	2.00
803.	Ettringite, ...			
51.	Eucairite, ...			
632.	Euchroite, . . .	.75	"	4.00
403.	Euclase, ...	2.00	"	15.00
345.	Eucolite, v., . . .	.75	"	2.50
510.	Eucolite-titanite, v.,			
395.	Eucrasite, r., . .			
358.	Eucryptite, . . .			
345.	Eudialyte, ...	.75	"	2.50
312.	Eudidymite, . . .	.40	"	1.50
450.	Eudnophite, v., .	.50	"	2.00
462.	Eukamptite, r., .			
368.	Eulytite, ...	$1.50	to	$6.00
253.	Eumanite, r., . .			
H.	Euosmite, ...			
459.	Euphyllite, r., . .	.50	"	2.00
549.	Eupyrchroite, v., .			
479.	Euralite, r., . . .			
564.	Eusynchite, r., . .			
450.	Euthallite, v., . .			
534.	Euxenite, ...	1.00	"	5.00
645.	Evansite, ...	.40	"	1.50
743.	Exanthalose, r., .			
210.	Eye-Agate, v., . .	.75	"	3.00
148.	Fahlerz, s., ...	.20	"	3.00
353.	Fahlunite, r., . .	.50	"	2.50
592.	Fairfieldite, . . .			
N.	Falkenhaynite, . .			
159.	Famatinite, . . .	1.00	"	4.00
453.	Fargite, v., . . .			
456.	Farœlite, v., . . .			
325.	Fassaite, v., . . .	.30	"	1.50
451.	Faujasite, ...	.40	"	1.50
750.	Fauserite, r., . .			
377.	Fayalite, ...	1.00	"	6.00
130.	Feather Ore, s., .	.30	"	4.00
N.	Fedorovite, . . .			
	Feldspar Group, 313-320,			
316.	" Soda, s., .	.10	"	1.50
793.	Felsöbanyite, . .			
812.	Ferberite, r., . .			
523.	Fergusonite, . . .	.50	"	2.50
376.	Ferrite, r., ...			
270.	Ferrocalcite, v., .	.30	"	2.00
89.	Ferrocobaltite, v.,			
526A.	Ferro-ilmenite, r.,			
777.	Ferronatrite, . .			
583.	Ferrostibian, r., .			
810.	Ferrotellurite, r.,			
233.	Ferrozincite, r., .			
210.	Ferruginous Quartz, v.,	.10	"	1.00
719.	Fetid Barite, v., .	.10	"	.50
270.	" Calcite, v., .			
505.	Fettbol, v., . . .			
788.	Fibroferrite, . . .	.50	"	2.50
399.	Fibrolite, v., . . .	.15	"	.75
H.	Fichtelite, ...	.25	"	1.00
191.	Fiedlerite, ...			
149.	Fieldite, r., . . .			
589.	Fillowite, ...			
212.	Fiorite, v., ...	.25	"	1.00
212.	Fire-opal, v., . . .	.20	"	1.50
640.	Fischerite, ...			
250.	Flêches d'Amour, s.,	.40	"	6.00
210.	Flexible Sandstone, v	.10	"	.75
580.	Flinkite, ...			
210.	Flint, v., ...	.10	"	.40
212.	Float-stone, v., . .			

277. Flos-ferri, v., . . . $ .20 to $3.00
203. Fluellite, ...
196. Fluocerite, ...75 " 3.00
175. Fluor, s., ...10 " 25.00
549. Fluor-apatite, v., . .15 " 4.00
175. Fluorite, ...10 " 25.00
175. Fluor Spar, s., . .10 " 25.00
195. Fluosiderite, r., .
106. Foliated Tellurium, s., ... 1.25 " 5.00
270. Fontainebleau Limestone, v., .20 " 4.00
N. Footeite, ...
625. Forbesite, ... 1.00 " 4.00
509. Forchhammerite, ap., ...
212. Forcherite, v., . . .50 " 2.50
443. Foresite, r., ...75 " 2.50
375. Forsterite, ...30 " 1.50
210. Fortification Agate, v., ...40 " 3.00
N. Fouquéite, ...
335. Fowlerite, v., ...30 " 5.00
549. Francolite, v., . . .40 " 3.00
N. Franckeite, . . .
708. Franklandite, r., .
239. Franklinite, ...20 " 3.00
149. Fredricite, v., . .
148. Freibergite, s., . . 2.00 " 3.00
135. Freieslebenite, . . 2.00 " 9.00
484. French Chalk, v., .10 " .40
395. Freyalite, r., . .
384. Friedelite, ... 1.25 " 5.00
56. Frieseite, v., . . .
665. Fritzscheite, r., .
458. Fuchsite, v., ...30 " 1.25
N. Fuggerite, ...50 " 2.00
500. Fuller's Earth, ap., .10 " .40
325. Funkite, v., . . .

389. Gabronite, r., . .
404. Gadolinite, ... 1.00 " 15.00
236. Gahnite, ...50 " 7.00
455. Galactite, v., . . .
45. Galena, ...25 " 2.00
45. Galenite, s., ...25 " 2.00
118. Galenobismutite, . 1.50 " 6.00
338. Gamsigradite, v.,
355. Ganomalite, ...40 " 2.00
432. Ganophyllite, . .
370. Garnet, ...20 " 5.00
483A. Garnierite, ...30 " 1.50
297. Gay-lussite, ...50 " 3.00
207. Gearksutite, ...40 " 2.00
H. Gedanite, ...
337A. Gedrite, ...
392. Gehlenite, ...25 " 1.50
N. Geikielite, ... 1.00 " 4.00
483. Genthite, ...20 " 1.50

H. Geocerellite, . . . $ $
H. Geocerite, ...
152. Geocronite, ...75 to 4.00
H. Geomyricite, . . .
688. Gerhardtite, . . .
90. Gersdorffite, . . . 1.00 " 5.00
97. Geyerite, v., . . .
212. Geyserite, v., ...40 " 2.00
264. Gibbsite, ...40 " 2.50
458. Gieseckite, r., . . .30 " 5.00
458. Gigantolite, r., . .
458. Gilbertite, v., ...40 " 1.50
506. Gillingite, r., ...75 " 2.50
H. Gilsonite, s., Uintahite, ...10 " .40
509. Ginilsite, ap., . .
212. Girasol, v., ...25 " 1.00
444. Gismondite, ...75 " 4.00
399. Glancespar, r., . .
505. Glasurite, r., . . .
718. Glauberite, ...25 " 3.00
743. Glauber Salt, s., .50 " 2.00
N. Glaucochroite, . . 2.00 " 9.00
101. Glaucodot, ...75 " 2.50
387. Glaucolite, v., . . .75 " 3.00
490. Glauconite, ...10 " .40
339. Glaucophane, . . .30 " 1.50
97. Glaucopyrite, s., . .20 " .75
H. Glessite, ...
376. Glinkite, v., . . .
648. Globosite, r., . .
792. Glockerite, ...
452. Glottalite, r., . .
448. Gmelinite, ...75 " 4.00
13. Gold, ...20 " 15.00
13. Gold Amalgam, r.,
344. Golden Beryl, v., . .75 " 5.00
N. Goldschmidtite, .
N. Gonnardite, . . .
344. Goshenite, v., . .
749. Goslarite, ...40 " 1.50
257. Göthite, ...25 " 1.50
657. Goyazite, ...
H. Grahamite, ...30 " 2.00
505. Graminite, v., . .
211. Granuline, r., ...40 " 1.50
104. Graphic Tellurium s., ... 1.00 " 7.00
2. Graphite, ...15 " .75
N. Graphitite, . . .
2. Graphitoid, r., . .
479. Grastite, r., . . .
148. Gray Copper Ore, s., .20 " 3.00
68. Greenockite, ...75 " 4.00
212. Green-opal, v., . . .25 " 3.00
510. Greenovite, v., . . .75 " 2.50
555. Griphite, r., ...25 " 1.50
469. Grochauite, r., . .
448. Groddeckite, r., .

509.	Groppite, ap., . .	$	$
370.	Grossularite, v., .	.25 to	3.00
510.	Grothite, v., . . .		
75.	Grünaüite, r., . .		
338.	Grünerite, v., . .		
N.	Grünlingite, . . .		
59.	Guadalcazarite, r.,		
30.	Guanajuatite, . .	1.00 "	4.00
585.	Guanapite, r., . .		
549.	Guano, r., ...	.10 "	.40
742.	Guanovulite, r., .		
585.	Guanoxalate, r., .		
512.	Guarinite, ...	.75 "	3.00
110.	Guejarite, ...		
142.	Guitermanite, . .	.40 "	1.50
497.	Gümbelite, r., . .		
712.	Gummite, ...	.50 "	2.00
N.	Gunnarite, ...		
175.	Gunnisonite, r., .		
H.	Guyaquillite, . . .		
482.	Gymnite, s., . . .	.20 "	1.00
746.	Gypsum, ...	.10 "	12.00
434.	Gyrolite, ...		
206.	Hagemannite, r., .	.20 "	.75
616.	Haidingerite, . .		
N.	Hainite, ...		
166.	Halite, ...	.10 "	1.50
480.	Hallite, r., ...	.20 "	.75
493.	Halloysite, ...	.30 "	1.25
769.	Halotrichite, . . .	.25 "	1.00
696.	Hambergite, . . .		
548.	Hamlinite, ...		
N.	Hancockite, . . .	.20 "	3.00
733.	Hanksite, ...	.25 "	2.00
623.	Hannayite, ...		
N.	Hardystonite, . .	.20 "	2.00
442.	Harmotome, . . .	.50 "	3.00
455.	Harringtonite, v.,		
54.	Harrisite, r., . .		
412.	Harstigite, ...		
H.	Hartite, ...	.25 "	1.00
N.	Hastingsite, . . .		
H.	Hatchettite, . . .	.25 "	2.00
521.	Hatchettolite . .		
N.	Hauchecornite, .		
86.	Hauerite, ...	.75 "	5.00
462.	Haughtonite, v., .		
243.	Hausmannite, . .	.20 "	4.00
N.	Hautefeuillite . .		
363.	Haüynite, ...	.30 "	5.00
447.	Haydenite, v., . .	.30 "	2.00
709.	Hayesine, r., . .		
210.	Haytorite, v., . .		
719.	Heavy Spar, s., .	.10 "	6.00
N.	Heazlewoodite, . .		
325.	Hectorite, r., . .		
325.	Hedenbergite, v., .	.30 "	5.00
552.	Hedyphane, r., . .	.75 "	4.00
706.	Heintzite, ...	$	$
H.	Helenite, ...		
210.	Heliotrope, v., . .	.25 to	1.00
462B.	Helvetan, r., . . .		
366.	Helvite, ...	.75 "	4.00
627.	Hemafibrite, . . .		
232.	Hematite, ...	.10 "	20.00
581.	Hematolite, . . .		
46.	Henryite, r., . .		
655.	Henwoodite, r., .	.75 "	2.50
66.	Hepatic Cinnabar, v.	.50 "	2.00
235.	Hercynite, ...	.25 "	1.00
547.	Herderite, ...	1.50 "	7.00
526A.	Hermannolite, r.		
780.	Herrengrundite, .	.50 "	2.00
275.	Herrerite, v., . .		
447.	Herschelite, v. . .	.50 "	4.00
N.	Hessenbergite, . .		
43.	Hessite, ...	2.00 "	15.00
269.	Hetærolite, ap., .	.25 "	1.00
269.	Heterogenite, ap.,		
130.	Heteromorphite, v.,	.30 "	2.00
544.	Heterosite, r., . .	.40 "	1.50
269.	Heubachite, ap., .		
438.	Heulandite, . . .	.30 "	4.00
338.	Hexagonite, v., . .	.10 "	.75
302.	Hibbertite, r., . .		
327.	Hiddenite, v., . .	.75 "	4.00
531.	Hielmite, ...	.50 "	2.00
185.	Hieratite, ...		
338.	Hillängsite, v., . .	.75 "	3.00
706.	Hintzeite, s., . . .		
334.	Hiortdahlite, . . .	.75 "	4.00
H.	Hircite, ...		
506.	Hisingerite, . . .	.40 "	1.50
270.	Hislopite, v., . . .		
N.	Hoeferite, ...		
600.	Hœrnesite, ...		
H.	Hofmannite, . . .		
787.	Hohmannite, r., .	.75 "	2.50
83.	Homichlin, r., . .		
402.	Homilite, ...	.75 "	3.00
587.	Hopeite, ...		
74.	Horbachite, r., . .		
338.	Hornblende, v., .	.10 "	5.00
210.	Hornblende in Quartz, v., . . .	.30 "	1.50
169.	Hornsilver, s., . .	.40 "	6.00
210.	Horn Stone (Chert), v.,	.10 "	.40
36.	Horsfordite, . . .		
376.	Hortonolite, r., .		
266.	Houghite, r., . .		
293.	Hovite, r., ...		
701.	Howlite, ...	.40 "	1.50
166.	Huantajayite, r., .	1.50 "	5.00
45.	Huascolite, r., . .		
813.	Hübnerite, ...	.50 "	2.00

325.	Hudsonite, v., . .	$		$
479.	Hullite, r., ...			
823.	Humboldtine, . .	1.00	to	4.00
H.	Huminite, ...			
414.	Humite, ...	1.00	"	5.00
H.	Humus acid, . . .			
35.	Huntilite, r., . . .	.75	"	3.00
624.	Hureaulite, . . .			
320.	Huronite, r., . . .			
500.	Hverlera, ap., . .			
394.	Hyacinth, v., . . .	.50	"	2.00
212.	Hyalite, v., . . .	.40	"	3.00
314.	Hyalophane, . . .			
376.	Hyalosiderite, v.,			
356.	Hyalotekite, . . .			
264.	Hydrargillite, s., .	.40	"	2.50
269.	Hydrated Titanic Oxide, ap., . . .			
270.	Hydraulic Limestone, v., . . .	.10	"	.40
549.	Hydroapatite, . r.,	.25	"	2.00
462.	Hydrobiotite, r., .			
710.	Hydroboracite, .			
N.	Hydrobucholzite,			
N.	Hydrocalcite, . .			
	Hydrocarbons. — Described at end of Dana classification.			
310.	Hydrocastorite, r.,			
292.	Hydrocerussite, .	1.50	"	5.00
298.	Hydroconite, r., .			
224.	Hydrocuprite, r.,	.20	"	1.00
724.	Hydrocyanite, . .			
302.	Hydrodolomite, r.,	.40	"	3.00
185.	Hydrofluorite, r.,			
269.	Hydrofranklinite, ap.,			
301.	Hydrogiobertite, .			
166.	Hydrohalite, r., .			
233.	Hydroilmenite, r.,			
300.	Hydromagnesite, .	.30	"	1.50
457.	Hydronephelite, .	.40	"	1.50
212.	Hydrophane, v., .	.40	"	2.00
174.	Hydrophilite, . .			
481.	Hydrophite, r., .	.50	"	2.50
269.	Hydroplumbite, ap.,			
335.	Hydrorhodonite, r.,	.50	"	3.00
N.	Hydrosamarskite,			
509.	Hydrosilicite, ap.			
468A.	Hydrotalc, v., . .			
266.	Hydrotalcite, . .	.30	"	1.50
379.	Hydrotephroite, r.,			
519.	Hydrotitanite, r.,	.10	"	1.00
291.	Hydrozincite, . .	.30	"	1.50
458.	Hygrophilite, r., .			
324.	Hypersthene, . .	.50	"	2.00
430.	Hypochlorite, ap.,			
316.	Hyposclerite, v., .			
233.	Hystatite, v., . .			

223.	Ice, ...	$		$
270.	Iceland Spar, v., .	.30	to	4.00
393.	Idocrase, s., . . .	.20	"	2.50
H.	Idrialite, ...			
N.	Idrizite, ...			
267.	Igelströmite, s., .	.50	"	3.00
378.	Igelströmite, v., .	.75	"	3.00
802.	Ignatievite, r., .			
774.	Ihlëite, ...			
747.	Ilesite, ...			
233.	Ilmenite, ...	.10	"	1.25
250.	Ilmenorutile, v., .			
219.	Ilsemannite, r., .			
417.	Ilvaite, ...	.75	"	4.00
320.	Indianite, v., . . .	.30	"	1.25
426.	Indicolite, v., . .	.20	"	10.00
431.	Inesite, ...	.50	"	2.50
212.	Infusorial Earth, v.,	.10	"	.40
172.	Iodobromite, . . .			
173.	Iodyrite, ...	1.50	"	8.00
353.	Iolite, ...	.10	"	3.00
H.	Ionite, ...			
21.	Iridium, ...			
22.	Iridosmine, . . .	.50	"	9.00
241.	Irite, r., ...			
25.	Iron, ...	.20	"	25.00
241.	" Chromic, s., .	.10	"	.50
237.	" Magnetic, s.,	.10	"	4.00
25.	" Meteoric, v., .	.20	"	25.00
85.	" Pyrites, s., . .	.10	"	3.00
25.	" Terrestrial, v.,	.75	"	9.00
233.	" Titaniferous, s.,	.10	"	1.25
751.	" Vitriol, s., . .	.30	"	1.25
233.	Iserine, r., ...	.75	"	3.00
250.	Iserite, r., ...			
	Isinglass (Mica), .			
626.	Isoclasite, ...			
210.	Itacolumyte, s. v.,	.10	"	.75
364.	Ittnerite, r., . . .			
371.	Ivarrite, r., . . .			
458.	Ivigtite, v., ...	.20	"	.75
526A.	Ixiolite, r., . . .			
H.	Ixolyte, ...			
240.	Jacobsite, ...	.40	"	2.00
328.	Jadeite, ...	.75	"	4.00
70.	Jaipurite, r., . . .			
42.	Jalpaite, r., . . .			
130.	Jamesonite, . . .	.30	"	4.00
394.	Jargon, v., ...	1.00	"	4.00
801.	Jarosite, ...	.40	"	2.00
210.	Jasper, v., ...	.15	"	2.00
210.	Jasperized Wood, v., ...	.15	"	12.00
212.	Jasp-opal, v., . . .	.20	"	.75
H.	Jaulingite, ...			
480.	Jefferisite, ...	.15	"	4.00
325.	Jeffersonite, v., .	.10	"	5.00
370.	Jelletite, v., . . .			

211. Jenzschite, r., . . $ $
692. Jeremejevite, . .
H. Jet, v. Coal, ...20 to .75
607. Jogynaite, r., . .
806. Johannite, ...
45. Johnstonite, v., .
515. Johnstrupite, . . .75 " 2.50
506. Jollyte, r., ...
150. Jordanite, ... 2.00 " 8.00
32. Josëite, ...
N. Josephinite, ...40 " 1.50
727. Jossaite, r., . . .

338. Kaersutite, . . .
730. Kainite, ...10 " .40
N. Kalgoorlite, . . . 2.00 " 8.00
705. Kaliborite, r., . .
287. Kalicine, r., . . .
764. Kalinite, ...20 " 1.00
359. Kaliophilite, . . .
360. Kalk-cancrinite, r.,
N. Kallilite, ...
N. Kamarezite, . . .
468A. Kämmererite, . v., .30 " 1.50
108. Kaneite, ap., . . .
492. Kaolin, s., ...10 " .40
492. Kaolinite, ...10 " .40
N. Karamsinite, . . .
537. Kärarfveite, r., .
217. Karelinite, r., . .
500. Keffekilite, ap., .
N. Kehoeite, ...
511. Keilhauite, ...30 " 2.00
420. Kentrolite, ...75 " 3.00
107. Kermesite, ... 1.00 " 5.00
480. Kerrite, r., ...
811. Kerstenite, r., . .
233. Kibdelophane, v.,
232. Kidney Ore, v., . .30 " 1.50
498. Kieselaluminite, r.,
744. Kieserite, ...10 " .40
154. Kilbrickenite, . .
458. Killinite, r., . . .
338. Kirwanite, r., . .
284. Kischtimite, r., .
553. Kjerulfine, v., . .50 " 3.00
124. Klaprotholite, . .
471. Klementite, r., . .50 " 2.00
335. Klipsteinite, r., .75 " 2.50
378. Knebelite, ...75 " 3.00
N. Knopite, ... 1.00 " 5.00
785. Knoxvillite, . . .
131. Kobellite, ...
523. Kochelite, r., . . .
H. Köflachite, ...
338. Koksharovite, .v., .75 " 2.50
17. Kongsbergite, v.,
614. Koninckite, ...50 " 2.50
H. Könlite, ...

520A. Koppite, ... $ .25 to $1.00
774. Kornelite, r., . .
429. Kornerupine, . .
468. Kotschubeite, v., .
604. Köttigite, ...
313. Krablite, r., ...75 " 2.50
233. Kragero Hematite, v.,
H. Krantzite, ...25 " 1.00
236. Kreittonnite, v., .
198. Kremersite, . . .
105. Krennerite, . . . 1.00 " 5.00
74. Krœberite, r., . .
776. Kröhnkite, ...50 " 2.50
762. Krugite, r., . . .
429. Kryptotil, r., . .
N. Ktypeite, ...
504. Kupferblau, r., .
337. Kupfferite, v., . .
14. Küstelite, v., . . .
N. Kylindrite, ...50 " 2.50

319. Labradorite, ...10 " 2.00
702. Lagonite, ...
269. Lampadite, r., . .
805. Lamprophanite, r.,
N. Lamprophyllite, .
N. Lamprostibian, .
737. Lanarkite, ... 2.00 " 15.00
419. Langbanite, ...75 " 4.00
N. Langbeinite, . . .
779. Langite, ...50 " 3.00
302. Lansfordite, . . .
298. Lanthanite, . . . 1.50 " 6.00
365. Lapis-Lazuli, s., . .30 " 2.00
703. Larderellite, . . . 1.00 " 4.00
549. Lasurapatite, v., .
320. Latrobite, v., . .
446. Laubanite, ...
445. Laumontite, ...50 " 4.00
189. Laurionite, ...40 " 1.50
94. Laurite, ...
N. Lautarite, ...
158. Lautite, r., ...
596. Lavendulan, r., . .50 " 2.50
332. Lavenite, ...
325. Lavrovite, v., . .
178. Lawrencite, ...75 " 3.00
N. Lawsonite, ...40 " 10.00
574. Lazulite, ...25 " 2.00
313. Lazurfeldspar, v.,
365. Lazurite, ...30 " 4.00
18. Lead, ...20 " 3.00
734. Leadhillite, ...75 " 5.00
742. Lecontite, ...
510. Lederite, v., ...30 " 1.25
719. Leedsite, r., . . .
313. Leelite, v., ...50 " 2.00
50. Lehrbachite, . . .
509. Leidyite, ap., . . .25 " 1.00

N.	Lembergite, . . .	$		$
480.	Lennilite, r., . . .	.25	to	1.50
493.	Lenzinite, v., . .			
445.	Leonhardite, v., .	.50	"	2.50
N.	Leonite, ...			
257.	Lepidokrokite, s.,	.25	"	1.50
460.	Lepidolite, ...	.10	"	1.50
462B.	Lepidomelane, . .	.30	"	1.25
458.	Lepidomorphite, v.,			
320.	Lepolite, v., . . .			
509.	Lesleyite, ap., . .	.75	"	3.00
781.	Lettsomite, s., . .	.75	"	3.00
325.	Leucaugite, v., . .			
468.	Leuchtenbergite, v.,	.50	"	2.00
321.	Leucite, ...	.30	"	2.50
631.	Leucochalcite, . .			
435.	Leucocyclite, v., .			
H.	Leucopetrite, . .			
351.	Leucophanite, . .	.40	"	1.50
458.	Leucophyllite, v.,			
97.	Leucopyrite, v., .	.20	"	.75
509.	Leucotile, ap., . .			
492.	Leverrierite, r., .			
59.	Leviglianite, r., .			
449.	Levynite, ...			
N.	Lewisite, ...			
562.	Libethenite, . . .	.75	"	4.00
458.	Liebenerite, r., . .	.20	"	.75
308.	Liebigite, ...			
417.	Lievrite, s,. . . .	.75	"	4.00
H.	Lignite, ...	.10	"	.40
510.	Ligurite, v., . . .			
140.	Lillianite, ...			
509.	Lillite, ap., . . .			
481.	Limbachite, r., .			
230.	Lime, r., ...			
288.	Lime-malachite, r.,			
270.	Limestone, s. v., .	.10	"	1.00
639.	Lime-wavellite, r.,			
259.	Limonite, ...	.10	"	.75
260.	Limnite, r., . . .			
741.	Linarite, ...	.75	"	6.00
681.	Lindackerite, . .			
320.	Lindsayite, v., . .			
79.	Linnæite, ...	.50	"	3.00
654.	Liroconite, ...	1.00	"	8.00
644.	Liskeardite, . . .	.50	"	2.50
460.	Lithia Mica, s., .	.10	"	1.50
544.	Lithiophilite, . . .	.15	"	.75
269.	Lithiophorite, r., .	.40	"	1.50
270.	Lithographic stone,	.10	"	.40
492.	Lithomarge, v., .	.25	"	1.00
109.	Livingstonite, . .	.75	"	2.50
237.	Lodestone, v., . .	.25	"	2.00
338.	Loganite, r., . . .			
468A.	Loganite, v., . . .			
97.	Löllingite, ...	.20	"	.75
N.	Lorandite, ...	1.00	"	6.00
N.	Lossenite, ...	.40	"	1.50
325.	Lotalite, v., . . .	$		$
435.	Louisite, r., . . .			
757.	Löweite, ...			
802.	Löwigite, ...			
313.	Loxoclase, v., . .	.15	to	1.00
480.	Lucasite, r., . . .			
638.	Ludlamite, ...	.75	"	4.00
694.	Ludwigite, ...	.40	"	1.50
270.	Lumachelle, v., .	.25	"	1.00
682.	Lüneburgite, . . .			
212.	Lussatite, . r., . .			
158.	Luzonite, r., . . .			
210.	Lydian Stone, s. v.,	.15	"	.50
458.	Lythrodes, r., . .			
35.	Macfarlanite, r., .			
N.	Mackintoshite, . .			
480.	Maconite, r., . . .			
270.	Madreporic Marble, v., ...	.20	"	.75
271.	Magnesian Limestone, s., ...	.10	"	.40
233.	Magnesian Menaccanite, v., . .			
238.	Magnesioferrite, .			
272.	Magnesite, ...	.10	"	1.00
237.	Magnetic Iron Ore, s., ...	.10	"	4.00
20.	Magnetic Platinum, v., ...			
74.	Magnetic Pyrites, s., ...	.10	"	2.50
237.	Magnetite, ...	.10	"	4.00
241.	Magnochromite, v.,			
810.	Magnolite, r., . .			
288.	Malachite, ...	.20	"	6.00
325.	Malacolite, v., . .	.10	"	.50
394.	Malacon, r., . . .	.10	"	.50
752.	Mallardite, . . .			
762.	Mamanite, r., . .			
N.	Manganandalusite,			
549.	Manganapatite, v.,			
N.	Manganberzeliite,			
262.	Manganbrucite, v.,			
325.	Manganhedenbergite, v., ...			
258.	Manganite, ...	.20	"	2.50
237.	Manganmagnetite, v.,			
270.	Manganocalcite, v.,	.25	"	1.00
274.	Manganocalcite, v.,			
N.	Manganoferrite, .			
462.	Manganophyllite, v.,	.40	"	2.00
226.	Manganosite, . .	1.00	"	4.00
583.	Manganostibiite, .			
330.	Manganpectolite, v., ...	.40	"	1.50
270.	Marble, v., ...	.20	"	1.00
96.	Marcasite, ...	.20	"	2.50
335.	Marceline, r., . .			

230.	Marcylite, r., . . .	$	$
464.	Margarite, ...	.30 to	2.00
458.	Margarodite, v., .	.20 "	.75
389.	Marialite, ...		
338.	Marmairolite, v., .		
58.	Marmatite, v., . .	.30 "	2.00
481.	Marmolite, v., . .	.15 "	.75
N.	Marshite, ...		
620.	Martinite, ...		
166.	Martinsite, r., . .		
232.	Martite, r., ...	.25 "	1.50
714.	Mascagnite, . . .	.50 "	2.00
319.	Maskelynite, r., .		
466.	Masonite, v., . . .	.10 "	.40
229.	Massicot, ...	1.00 "	5.00
120.	Matildite, ...		
186.	Matlockite, . . .	1.00 "	15.00
376.	Matricite, r., . . .		
N.	Mauzeliite, ...		
651.	Mazapilite, ...	1.00 "	4.00
807.	Medjidite, r., . . .		
492.	Meerschaluminite, r., ...		
485.	Meerschaum, s., .	.20 "	1.25
386.	Meionite, ...	.50 "	2.00
230.	Melaconite, v., . .	.40 "	1.50
544.	Melanchlor, r., .		
370.	Melanite, v., . . .	.25 "	3.00
348.	Melanocerite, . .		
479.	Melanolite, r., . .		
211.	Melanophlogite, r.,	.30 "	2.00
506.	Melanosiderite, r.,	1.00 "	4.00
421.	Melanotekite, . .	.40 "	2.00
193.	Melanothallite, r.,		
751.	Melanterite, . . .	.30 "	1.25
391.	Melilite, ...	.40 "	1.50
500.	Melinite, ap., . .		
352.	Meliphanite, . . .	.75 "	3.00
824.	Mellite, ...	.50 "	2.00
77.	Melonite, ...		
509.	Melopsite, ap., . .		
233.	Menaccanite, s., .	.10 "	1.25
187.	Mendipite, ...	.75 "	4.00
766.	Mendozite, ...	1.00 "	4.00
151.	Meneghinite, . . .	.50 "	4.00
526A.	Mengite, r., . . .		
212.	Menilite, v., . . .	.10 "	.50
58.	Mercurial Blende, v.,		
16.	Mercury, ...	.50 "	2.00
462.	Meroxene, v., . .	.10 "	3.00
272A.	Mesitite, ...	.50 "	2.00
456.	Mesole, v., ...	.25 "	1.00
449.	Mesolin, r., . . .		
455.	Mesolite, ...	.40 "	1.50
453.	Mesotype, s., . .	.30 "	2.00
593.	Messelite, ...	.40 "	1.50
619.	Metabrushite, . .		
471.	Metachlorite, r., .	.50 "	2.00
59.	Metacinnabarite, .	.40 "	1.50
N.	Metadesmine, . .	$	$
N.	Metanocerine, . .		
N.	Metascolecite, . .		
458.	Metasericite, v., .		
28.	Metastibnite, r., .		
797.	Metavoltine, . . .		
481.	Metaxoite, r., . .		
25.	Meteoric Iron, v.,	.20 to	25.00
25.	Meteoric Stone, v.,	1.00 "	5.00
270.	Mexican Onyx, v.,	.30 "	1.50
220.	Meymacite, r., . .		
121.	Miargyrite, . . .	1.50 "	9.00
232.	Micaceous Iron Ore, v., ...	.10 "	.50
	Mica Group, 458-463,		
212.	Michaelite, v., . .		
315.	Microcline, ...	.25 "	7.00
522.	Microlite, ...	.40 "	2.00
361.	Microsommite, . .	1.50 "	6.00
H.	Middletonite, . .		
N.	Miersite, ...		
550.	Miesite, v., ...		
320.	Mikrotin, r., . . .		
311.	Milarite, ...	1.25 "	5.00
212.	Milk-opal, v., . . .	.25 "	1.00
210.	Milky Quartz, v., .	.10 "	1.00
70.	Millerite, ...	.30 "	2.00
500.	Miloschite, ap., .		
551.	Mimetite, ...	.50 "	3.00
H.	Mineral Coal, . .	.10 "	.40
N.	Minervite, ...		
244.	Minium, ...	1.00 "	6.00
743.	Mirabilite, ...	.50 "	2.00
682.	Miriquidite, ap., .		
735.	Misenite, ...		
98.	Mispickel, s., . . .	.10 "	1.50
N.	Mitchellite, . . .		
668.	Mixite, ...	.40 "	1.50
388.	Mizzonite, ...	.50 "	2.00
210.	Mocha-Stone, s. v.,	.15 "	2.00
34.	Molybdenite, . . .	.20 "	10.00
219.	Molybdic Ocher, s.,	.40 "	1.50
219.	Molybdite, ...	.40 "	1.50
811.	Molybdomenite, r.,		
181.	Molysite, ...		
537.	Monazite, ...	.15 "	2.00
560.	Monetite, ...	.25 "	1.00
539.	Monimolite, . . .		
325.	Monradite, r., . .		
808.	Montanite, ...		
374.	Monticellite, . . .	.30 "	4.00
496.	Montmorillonite, .	.20 "	.75
430.	Monzonite, ap., .		
315.	Moonstone, v., . .	.20 "	1.50
316.	Moonstone, v., . .	.20 "	1.50
437.	Mordenite, ...		
750.	Morenosite, . . .		
423.	Moresnetite, r., .	.40 "	1.50
N.	Morinite, ...		

516.	Mosandrite, . . .	$ .50	to	$2.00
210.	Moss-Agate, v., . .	.15	"	2.00
N.	Mossite, ...			
277.	Mossottite, v., . .	.40	"	1.50
567.	Mottramite, r., .			
338.	Mountain Cork, v.,	.20	"	.75
338.	Mountain Leather v., ...	.10	"	.50
338.	Mountain Wood, v.,	.20	"	.75
H.	Muckite, ...			
104.	Müllérine, r., . .			
585.	Müllerite, r., . . .			
N.	Munkforssite, . .			
313.	Murchisonite, v., .			
409.	Muromontite, r., .			
N.	Mursinskite, . . .			
458.	Muscovite, ...	.10	"	2.00
325.	Mussite, v., . . .	.20	"	.75
288.	Mysorin, r., . . .			
672.	Nadorite, ...	.50	"	3.00
509.	Næsumite, ap., .			
106.	Nagyagite, ...	1.25	"	5.00
270.	Nail-head Spar, v.,	.30	"	1.50
269.	Namaqualite, ap.,			
165.	Nantokite, ...	.50	"	2.00
H.	Napalite, ...			
H.	Naphtha, ...			
H.	Naphthalene, . .			
N.	Nasonite, ...	1.00	"	4.00
H.	Native Humus Acid,			
453.	Natrolite, ...	.30	"	2.00
296.	Natron, ...			
346.	Natron-catapleiite, v., ...			
545.	Natrophilite, . . .			
560.	Natrophite, r., . .			
48.	Naumannite, . . .	.40	"	1.50
313.	Necronite, v., . .			
453.	Needle Zeolite, s.,	.30	"	2.00
509.	Nefedieffite, ap., .			
H.	Neft-gil, ...			
262.	Nemalite, v., . . .			
376.	Neochrysolite, r.,	1.25	"	5.00
430.	Neociano, ap., . .	1.00	"	4.00
509.	Neolite, ap., . . .			
509.	Neotocite, ...			
149.	Nepaulite, r., . .			
357.	Nephelite, ...	.15	"	3.00
338.	Nephrite, v., . . .	.20	"	.75
N.	Neptunite, ...	1.00	"	4.00
295.	Nesquehonite, .	.75	"	3.00
H.	Neudorfite, . . .			
497.	Neurolite, r., . .			
22.	Nevyanskite, v., .			
621.	Newberyite, . . .	.25	"	2.00
494.	Newtonite, ...			
98.	Niccoliferous Arsenopyrite, v., .			
25.	Niccoliferous Iron (Awaruite), v., .	$		$
74.	Niccoliferous Pyrite, s., ...	.10	to	2.50
71.	Niccolite, ...	.40	"	3.00
N.	Nickel, ...			
602.	Nickel Bloom, s., .	.35	"	1.50
90.	Nickel Glance, s.,	1.00	"	5.00
237.	Nickel Oxide, r., .			
N.	Nickel-skutterudite,			
509.	Nigrescite, ap., .			
250.	Nigrine, v., . . .	.15	"	.75
684.	Niter, ...			
687.	Nitrobarite, . . .			
685.	Nitrocalcite, . . .			
690.	Nitroglauberite, .			
686.	Nitromagnesite, .			
711.	Nivenite, v., . . .			
195.	Nocerite, ...	.30	"	1.50
529.	Nohlite, r., . . .			
H.	Non-caking Coal,	.10	"	.40
505.	Nontronite, v., . .			
338.	Noralite, v., . . .			
691.	Nordenskiöldine, .			
338.	Nordenskiöldite, v.,			
428.	Nordmarkite, v., .			
N.	Northupite, . . .	.20	"	1.50
364.	Nosean, s., ...	.40	"	1.50
364.	Noselite, ...	.40	"	1.50
483A.	Noumeite, s., . . .	.30	"	1.50
550.	Nussierite, v., . .			
387.	Nuttalite, v., . . .	.25	"	1.00
500.	Ochran, ap., . . .			
674.	Ochrolite, ...			
252.	Octahedrite, . . .	.50	"	2.50
458.	Oellacherite, v., .	.50	"	2.00
394.	Oerstedite, r., . .			
N.	Offrétite, ...	.30	"	1.50
433.	Okenite, ...	.40	"	1.50
316.	Olafite, v., ...	.75	"	2.50
64.	Oldhamite, ...			
317.	Oligoclase, ...	.15	"	3.00
273.	Oligonite, v., . . .			
561.	Olivenite, ...	.50	"	3.00
376.	Olivine, v., . . .	.10	"	.50
325.	Omphacite, v., . .	.20	"	1.00
458.	Oncophyllite, v., .			
458.	Oncosine, v., . . .			
210.	Onegite, s. v., . .	.75	"	3.00
61.	Onofrite, ...			
811.	Onofrite, r., . . .			
387.	Ontariolite, v., . .			
210.	Onyx, v., ...	.40	"	1.50
270.	Onyx, Mexican, v.,	.30	"	2.00
270.	Oölite, v., ...	.10	"	.50
458.	Oosite, r., ...			
212.	Opal, ...	.50	"	20.00
212.	Opal-agate, v., . .	.30	"	1.50

212.	Opalized Wood, v.,	$ .20	to	$12.00
395.	Orangite, v., . . .	1.00	"	4.00
500.	Oravitzite, ap., . .			
37.	Orileyite, r., . . .			
619.	Ornithite, v., . .			
27.	Orpiment, ...	.15	"	2.00
409.	Orthite, s., ...	.20	"	1.00
313.	Orthoclase, . . .	.10	"	3.00
438.	Oryzite, r., ...			
64.	Osbornite, r., . .			
330.	Osmelite, v., . . .			
22.	Osmiridium, s., .	.50	"	9.00
549.	Osteolite, v., . . .			
467.	Ottrelite, ...	.20	"	.75
370.	Ouvarovite, s. v., .	.75	"	3.00
823.	Oxalate of Sodium and Ammonium, r., . .			
585.	Oxammite, r., . .			
822.	Oxammite, ...			
435.	Oxhaverite, v., . .			
456.	Ozarkite, v., . . .	.10	"	1.00
H.	Ozocerite, ...	.10	"	.50
205.	Pachnolite, . . .	.20	"	1.25
97.	Pacite, r., ...			
480.	Painterite, r., . .			
335.	Paisbergite, v., .	.30	"	5.00
338.	Paligorskite, r., .			
230.	Palladinite, r., . .			
23.	Palladium, ...			
13.	Palladium Gold, v.,			
704.	Pandermite, r., .	.25	"	1.00
270.	Papierspath, . . .	.50	"	2.00
787.	Paposite, r., . . .			
233.	Paracolumbite, v.,	.10	"	.40
313.	Paradoxite, v., . .			
H.	Paraffin, ...			
459.	Paragonite, . . .	.25	"	1.00
N.	Paralaurionite, .			
389.	Paralogite, r., . .			
794.	Paraluminite, . .			
N.	Paramelaconite, .			
271A.	Parankerite, s., .	.40	"	2.50
N.	Parathorite, . . .			
338.	Pargasite, v., . .	.10	"	5.00
284.	Parisite, ...	2.00	"	10.00
N.	Paroligoclase, . .			
458.	Parophite, r., . .			
372.	Partschinite, . .			
222.	Partzite, r., . . .	.25	"	1.00
387.	Passauite, v., . .			
211.	Passyite, r., . . .			
789.	Pastreite, r., . . .			
819.	Pateraite, r., . .			
479.	Pattersonite, r., .			
H.	Peacock Coal, v.,	.10	"	.40
N.	Pearceite, ...			
212.	Pearl Sinter, v., .			
271.	Pearl Spar, v., . .	$ .15	to	$2.00
324.	Peckhamite, r., .			
330.	Pectolite, ...	.20	"	1.50
641.	Peganite, ...			
269.	Pelagite, ap., . .			
N.	Pelagosite, . . .			
509.	Pelhamine, ap., .			
480.	Pelhamite, v., . .			
270.	Pencatite, r., . . .			
N.	Penfieldite, . . .			
468A.	Penninite, ...	.50	"	2.00
65.	Pentlandite, . . .			
509.	Penwithite, r., .			
192.	Percylite, ...	1.25	"	5.00
225.	Periclase, ...	.50	"	2.00
316.	Pericline, v., . . .	.40	"	1.50
376.	Peridot, s., ...	.10	"	.50
316.	Peristerite, v., . .	.40	"	1.50
518.	Perovskite, ...	.40	"	3.00
509.	Persbergite, ap., .	.75	"	3.00
313.	Perthite, r., . . .	.20	"	1.50
310.	Petalite, ...	.25	"	1.00
212.	Petrified Wood, v.,			
210.	(Opalized and Jasperized), .	.15	"	12.00
H.	Petrolene, ...			
H.	Petroleum, ...	.10	"	.40
796.	Pettkoite, r., . .			
44.	Petzite, ...	1.00	"	4.00
338.	Phaactinite, r., .			
447.	Phacolite, v., . .	.50	"	4.00
617.	Pharmacolite, . .	.75	"	3.00
646.	Pharmacosiderite,	.75	"	2.50
324.	Phästine, r., . . .			
382.	Phenacite, ...	.50	"	6.00
480.	Philadelphite, r., .			
776.	Phillipite, r., . .			
441.	Phillipsite, ...	.50	"	3.00
462A.	Phlogopite, . . .	.10	"	1.00
726.	Phœnicochroite, .			
491.	Pholidolite, . . .			
286.	Phosgenite, . . .	.75	"	5.00
585.	Phosphammite, r.,			
549.	Phosphatic Nodules, r., ...	.10	"	.40
549.	Phosphorite, v., .	.10	"	.40
609.	Phosphosiderite, .			
664.	Phosphuranylite,			
335.	Photicite, r., . . .	.20	"	.75
467.	Phyllite, v., . . .	.15	"	.50
H.	Phylloretin, . . .			
397.	Physalite, v., . . .			
H.	Phytocollite, . . .			
H.	Piauzite, ...			
648.	Picite, r., ...			
768.	Pickeringite, . . .	.25	"	1.00
234.	Picotite, v., . . .			
768.	Picroallumogene, r.,	.30	"	1.25
407.	Picroepidote, r., .			

509.	Picrofluite, ap., . .	$		$
481.	Picrolite, v., . . .	.20	to	.75
760.	Picromerite, . . .			
595.	Picropharmacolite,			
325.	Picrophyll, r., . .			
509.	Picrosmine, ap., .	.25	"	1.50
456.	Picrothomsonite r.,			
337.	Piddingtonite, r.,			
408.	Piedmontite, . . .	.30	"	1.50
824.	Pigotite, r., . . .	.75	"	3.00
509.	Pihlite, ap., . . .	.75	"	2.50
504.	Pilarite, v., . . .			
509.	Pilinite, ap., . . .	.50	"	2.00
509.	Pilolite, ap., . . .			
483A.	Pimelite, r., . . .			
695.	Pinakiolite, . . .	.40	"	3.00
505.	Pinguite, v., . . .			
458.	Pinitoid, r., . . .	.25	"	1.00
705.	Pinnoite, ...			
N.	Pirssonite, ...	.75	"	4.00
753.	Pisanite, ...	.40	"	1.50
270.	Pisolite, v., ...	.25	"	1.00
794.	Pissophanite, r., .			
272A.	Pistomesite, v., .	.25	"	2.00
711.	Pitchblende, s., .	.50	"	6.00
325.	Pitkärantite, r., .			
H.	Pittasphalt, . . .			
678.	Pitticite, ...	.75	"	3.00
801.	Plagiocitrite, r., .			
122.	Plagionite, ...	1.00	"	5.00
108.	Plakodin, ap., . .			
611.	Planerite, r., . . .			
N.	Planoferrite, . . .			
210.	Plasma, v., . . .	.20	"	.75
20.	Platinum, ...	.50	"	9.00
251.	Plattnerite, . . .	1.50	"	7.00
120.	Plenargyrite, r., .			
234.	Pleonaste, s. v., .	.30	"	1.25
552.	Pleonectite, r., . .	.75	"	3.00
582.	Pleurasite, r., . .			
500.	Plinthite, ap., . .			
435.	Plombierite, r., .			
2.	Plumbago, s., . . .	.15	"	.75
498.	Plumballophane, r.,			
229.	Plumbic Ocher, s.,	1.00	"	5.00
270.	Plumbocalcite, v.,	.50	"	2.00
241.	Plumboferrite, r.,			
658.	Plumbogummite,	2.00	"	15.00
108.	Plumbomanganite, ap., ...			
108.	Plumbostannite, ap.,			
249.	Polianite, ...	.30	"	1.50
322.	Pollucite, ...	.50	"	2.00
370.	Polyadelphite, v.,	.30	"	2.00
458.	Polyargite, r., . .			
157.	Polyargyrite, . .			
557.	Polyarsenite, v., .	.75	"	3.00
156.	Polybasite, ...	1.00	"	6.00
535.	Polycrase, ...	1.00	"	5.00
75.	Polydymite, . . .	$		$
762.	Polyhalite, ...	.15	to	.50
509.	Polyhydrite, ap., .			
N.	Polylite, ...			
461.	Polylithionite, v.,			
533.	Polymignite, . . .			
550.	Polysphœrite, . v.,			
149.	Polytelite, r., . .			
481.	Porcellophite, . v.,	.20	"	.75
13.	Porpezite, v., . .			
500.	Portite, ap., . . .			
H.	Posepnyte, ...			
764.	Potash Alum, s., .	.20	"	1.00
458.	Potash Mica, s., .	.10	"	2.00
484.	Potstone, v., . . .	.10	"	.40
816.	Powellite, ...			
210.	Prase, v., ...	.30	"	1.25
479.	Prasilite, r., . . .			
212.	Precious Opal, v.,	.50	"	20.00
270.	Predazzite, r., . .	.30	"	1.50
411.	Prehnite, ...	.20	"	3.00
411.	Prehnitoid, r., . .			
388.	Prehnitoid v., . .			
58.	Pribramite, v., . .			
704.	Priceite, r., . . .	.25	"	1.00
429.	Prismatine, r., .			
469.	Prochlorite, . . .	.10	"	1.00
185.	Proidonite, r., . .			
N.	Prolectite, ...			
204.	Prosopite, ...			
325.	Protheite, v., . .	.75	"	3.00
461.	Protolithionite, r.,			
505.	Protonontronite, r.,			
480.	Protovermiculite, r.	.20	"	.75
145.	Proustite, ...	.50	"	8.00
549.	Pseudoapatite, v.,			
538.	Pseudoberzeliite, r.,			
462.	Pseudobiotite, r.,			
246.	Pseudobrookite, .	.50	"	2.00
180.	Pseudocotunnite, r.,			
570.	Pseudomalachite,	.50	"	2.50
437.	Pseudonatrolite, .			
195.	Pseudonocerina, r.			
468A.	Pseudophite, v., .			
N.	Pseudopyrophyllite,			
389.	Pseudo-Scapolite, r.,			
344.	Pseudosmaragd, r.,			
543.	Pseudotriplite, r.,	.75	"	2.50
269.	Psilomelane. . . .	.10	"	1.00
567.	Psittacinite, . . .			
342.	Pterolite, r., . . .			
462B.	Pterolite, r., . . .			
436.	Ptilolite, ...	.75	"	2.50
542.	Pucherite, ...	1.00	"	5.00
270.	Pudding-stone, v., (also v. of 210),	.10	"	1.25
78.	Purple Copper Ore, s., ...	.30	"	5.00
397.	Pycnite, v., ...	.30	"	1.50

458.	Pycnophillite, v., .	$		$	
509.	Pyknotrop, ap., .				
325.	Pyrallolite, r., . .				
484.	Pyrallolite, v., . .				
144.	Pyrargyrite, . . .	.50	to	6.00	
85.	Pyrite, ...	.10	"	3.00	
98.	Pyrites, Arsenical, s., ...	.10	"	1.50	
96.	Pyrites, Cockscomb, s., ...	.20	"	2.50	
83.	Pyrites, Copper, s.,	.20	"	3.00	
85.	" Iron, s., .	.10	"	3.00	
74.	" Magnetic, s.,	.10	"	2.50	
96.	" Radiated, v.,	.20	"	1.50	
84.	" Tin, s., . .	.30	"	2.00	
267.	Pyroaurite, . . .	.50	"	3.00	
520.	Pyrochlore, . . .	.50	"	2.50	
263.	Pyrochroite, . . .	.50	"	2.50	
509.	Pyroïdesine, ap., .				
254.	Pyrolusite, ...	.10	"	3.00	
510.	Pyromelane, r., .				
550.	Pyromorphite, . .	.20	"	5.00	
370.	Pyrope, v., ...	.20	"	2.00	
N.	Pyrophanite, . . .				
586.	Pyrophosphorite, r.,				
497.	Pyrophyllite, . . .	.25	"	3.00	
H.	Pyropissite, . . .	.10	"	.50	
H.	Pyroretinite, . .				
409.	Pyrorthite, v., . .				
480.	Pyrosclerite, r., .				
385.	Pyrosmalite, . . .	1.00	to	4.00	
146.	Pyrostilpnite, . .	1.50	"	5.00	
325.	Pyroxene, ...	.10	"	7.00	
522.	Pyrrhite, r., . . .				
74.	Pyrrhotite, ...	.10	"	2.50	
210.	Quartz, ...	.10	"	25.00	
N.	Quartzine, ...	.40	"	1.50	
773.	Quenstedtite, . .				
804.	Quetenite, ...				
16.	Quicksilver, s., . .	.50	"	2.00	
509.	Quincite, ap., . .				
269.	Rabdionite, ap., .				
461.	Rabenglimmer, v.,	.40	"	2.00	
96.	Radiated Pyrites, v., ...	.50	"	2.50	
210.	Radiated Quartz, v., ...	.30	"	1.25	
453.	Radiolite, v., . . .				
786.	Raimondite, . . .				
208.	Ralstonite, ...	.75	"	3.00	
100.	Rammelsbergite, .	1.00	"	4.00	
430.	Ramosite, ap., . .				
212.	Randannite, v., .				
309.	Randite, . r., . . .	.30	"	1.25	
457.	Ranite, v., ...				
338.	Raphilite, v., . . .				
232.	Raphisiderite, r., .				
462.	Rastolyte, r., . . .	$		$	
N.	Rathite, ...				
496.	Razoumovskyn, r.,	.40	to	1.50	
26.	Realgar, ...	.50	"	3.00	
492.	Rectorite, r., . . .	.30	"	1.25	
594.	Reddingite, . . .				
785.	Redingtonite, r., .				
232.	Red Iron Ore, s., .	.10	"	.40	
232.	" Ocher, v., . .	.10	"	.40	
585.	Redondite, r., . .				
212.	Red-opal, v., . . .	.25	"	1.00	
54.	Redruthite, s., . .	.50	"	6.00	
483A.	Refdanskite, r., .				
H.	Refikite, ...				
162.	Regnolite, r., . .				
270.	Reichite, v., . . .				
819.	Reinite, ...				
304.	Remingtonite, . .	.75	"	3.00	
484.	Rensselaerite, v.,	.10	"	.40	
212.	Resin-opal, v., . .	.25	"	1.00	
509.	Restormelite, ap.,				
481.	Retinalite, v., . .				
H.	Retinellite, . . .				
H.	Retinite (Amber-like resins), . .	.20	"	3.00	
N.	Retzian, ...				
H.	Reussinite, ...				
113.	Rezbanyite, . . .				
25.	Rhabdite, r., . . .				
605.	Rhabdophanite, .				
667.	Rhagite, ...				
500.	Rhodalite, ap., . .				
13.	Rhodite, v., ...				
699.	Rhodizite, ...				
468.A.	Rhodochrome, v.,	.30	"	1.25	
274.	Rhodochrosite, . .	.15	"	15.00	
N.	Rhodolite, ...	.50	"	3.00	
335.	Rhodonite, ...	.15	"	5.00	
210.	Riband Jasper, v.,	.15	"	2.00	
653.	Richellite, r., . . .	.75	"	3.00	
155.	Richmondite, r., .				
264.	" r., .				
338.	Richterite, v., . .	.50	"	2.50	
340.	Riebeckite, . . .				
517.	Rinkite, ...				
149.	Rionite, v., ...				
468.	Ripidolite, s., . .	.20	"	2.00	
388.	Riponite, v., . . .				
147.	Rittingerite, . . .				
222.	Rivotite, r., . . .				
H.	Rochlederite, . .				
210.	Rock Crystal, v., .	.20	"	25.00	
746.	Rock-gypsum, v., .	.10	"	.40	
270.	Rock-meal, v., . .	.15	"	.50	
270.	Rock-milk, s. v., .	.15	"	.50	
166.	Rock Salt, s., . . .	.10	"	1.50	
N.	Roeblingite, . . .	1.00	"	4.00	
379A.	Roepperite, . . .	.75	"	2.50	
535.	Rogersite, ap., . .	.40	"	1.50	

671.	Römeite, ...	$		$
778.	Römerite, ...	.50	to	2.00
463.	Roscoelite, ...	1.00	"	7.00
480.	Roseite, r., ...	.25	"	1.50
590.	Roselite, ...	1.50	"	6.00
331.	Rosenbuschite, . .	.50	"	2.00
210.	Rose Quartz, v., .	.15	"	12.00
458.	Rosite, r., ...			
622.	Rösslerite, r., . .			
344.	Rosterite, r., . .			
H.	Rosthornite, . . .			
370.	Rothoffite, v., . .	.50	"	2.00
483.	Röttisite, r., . . .	.20	"	.75
N.	Rowlandite, . . .			
462.	Rubellan, r., . .	.25	"	1.00
426.	Rubellite, v., . . .	.20	"	25.00
509.	Rubislite, ap., . .			
783.	Rubrite, r., . . .			
231.	Ruby, v., ...	.75	"	4.00
234.	" Balas, s. v.,	.25	"	1.00
58.	" Blende, v., .	.20	"	8.00
224.	" Copper, s., .	.20	"	3.00
145.	" Silver s., 144, 145, . . .	.50	"	8.00
234.	" Spinel, v., .	.25	"	1.00
58.	" Zinc., s., . .	.20	"	3.00
270.	Ruin Marble, v., .	.75	"	2.50
H.	Rumänite, ...			
479.	Rumpfite, ...			
523.	Rutherfordite, r.,			
250.	Rutilated Quartz, v.	.40	"	6.00
250.	Rutile, ...	.15	"	7.00
99.	Safflorite, ...	.40	"	1.50
168.	Sal-Ammoniac, . .	.25	"	1.00
325.	Salite, v., ...	.20	"	.75
466.	Salmite, v., ...			
166.	Salt, s., ...	.10	"	1.50
684.	Saltpeter, s., . . .			
N.	Salvadorite, . . .			
529.	Samarskite, . . .	1.00	"	4.00
498.	Samoite, r., . . .			
149.	Sandbergerite, v.,	.75	"	3.00
210.	Sandstone, v., . .	.10	"	.40
210.	" Flexible, v.,	.10	"	.75
N.	Sanguinite, . . .			
313.	Sanidine, v., . . .	.25	"	1.00
488.	Saponite, ...	.10	"	.50
231.	Sapphire, v., . . .	.40	"	3.00
210.	Sapphire-Quartz, v.,	.30	"	1.50
430.	Sapphirine, . . .	.50	"	2.00
390.	Sarcolite, ...	.50	"	2.00
555.	Sarcopside, r., . .			
210.	Sard, v., ...	.20	"	.75
210.	Sardonyx, v., . . .	.20	"	.75
557.	Sarkinite, ...	.75	"	2.50
115.	Sartorite, ...			
457.	Sasbachite, ap., .			
265.	Sassolite, ...			
270.	Satin Spar, v., . .	$ .25	to	$1.00
746.	Satin Spar, v., . .	.20	"	1.25
406.	Saussurite, r., . .	.15	"	.75
179.	Scacchite, ...			
387.	Scapolite, s., . . .	.15	"	4.00
500.	Scarborite, r., . .			
129.	Schapbachite, . .			
814.	Scheelite, ...	.50	"	8.00
H.	Scheererite, . . .			
325.	Schefferite, v., . .	.50	"	2.00
324.	Schiller Spar, r., .			
125.	Schirmerite, . . .			
669.	Schneebergite, r.,			
445.	Schneiderite, v., .			
719.	Schoarite, v., . .			
426.	Schorl, s., ...	.20	"	3.00
371.	Schorlomite, . . .	.25	"	1.00
H.	Schraufite, ...			
25.	Schreibersite, r., .	2.00	"	25.00
309.	Schröckinergite, r.,			
500.	Schrötterite, . . .	.75	"	2.50
N.	Schulzenite, . . .			
2.	Schungite, r., . .			
188.	Schwartzemberg-ite, ...	1.00	"	5.00
148.	Schwatzite, v., . .	.75	"	2.50
H.	Scleretinite, . . .			
454.	Scolecite, ...	.30	"	2.00
607.	Scorodite, ...	.40	"	2.50
407.	Scorza, v., ...			
506.	Scotiolite, v., . .			
456.	Scoulerite, v., . .			
605.	Scovillite, s., . . .			
447.	Seebachite, v. s.,	.50	"	4.00
N.	Seelandite, ...			
309.	Selbite, r., ...			
118.	Seleniferous Galen-obismutite, v., .	1.50	"	6.00
746.	Selenite, v., . . .	.10	"	12.00
5.	Selenium, ...			
218.	Selenolite, r., . .			
4.	Selensulphur, . .	.50	"	4.00
6.	Selen-Tellurium, .			
177.	Sellaite, ...			
500.	Selwynite, ap., . .			
212.	Semi-Opal, v., . .	.25	"	3.00
133.	Semseyite, ...			
N.	Senaite, ...			
214.	Senarmontite, . .	.40	"	3.00
485.	Sepiolite, ...	.50	"	2.00
458.	Sericite, v., . . .	.20	"	.75
481.	Serpentine, ...	.10	"	2.00
481.	" Marble, v.,	.30	"	2.00
782.	Serpierite, ...	.75	"	2.50
H.	Settling Stones Resin, ...			
465.	Seybertite, ...	.40	"	2.00
270.	Shell-Marble, v., .	.25	"	1.00
273.	Siderite, ...	.10	"	3.00

25.	Siderites (Meteoric), v., ...	$ .20	to	$25.00
273.	Siderodot, v., . .			
25.	Siderolites, v., . .	1.00	"	5.00
799.	Sideronatrite, . .	.75	"	3.00
462.	Siderophyllite, v.,	.30	"	2.00
273.	Sideroplesite, . v.,			
N.	Siderotil, ...			
H.	Siegburgite, . . .	.20	"	1.00
79.	Siegenite, v., . . .	.50	"	3.00
270.	Siena Marble, v., .	.20	"	.75
320.	Sigterite, r., . . .			
30.	Silaonite r., . . .			
338.	Silfbergite, v., . .			
210.	Siliceous Sinter, v.,			
210.	Silicified Wood, v., (also v., 212),	.15	"	12.00
399.	Sillimanite, ...	.15	"	.75
14.	Silver, ...	.30	"	6.00
153.	" Brittle, s., .	.75	"	6.00
144.	" Dark Ruby, s., ...	.50	"	6.00
42.	" Glance, s., .	.40	"	8.00
169.	" Horn, s., . .	.40	"	6.00
145.	" Light Ruby, s., ...	.50	"	8.00
H.	Simetite, ...	.50	"	2.00
500.	Sinopite, ap., . . .			
524.	Sipylite, ...	1.50	"	5.00
22.	Siserskite, v., . .			
466.	Sismondine, v., .			
526A.	Skogbölite, ...	.75	"	3.00
95.	Skutterudite, . .	1.25	"	5.00
457.	Sloanite, ap., . . .			
87.	Smaltite, ...	.50	"	3.00
338.	Smaragdite, v., . .	.30	"	1.50
500.	Smectite, ap., . .			
493.	Smectite, v., . . .			
275.	Smithsonite, . . .	.20	"	3.00
210.	Smoky Quartz, v.,	.10	"	3.00
N.	Snarumite, . . .			
484.	Soapstone, s., . .	.10	"	.40
316.	Soda Feldspar, s.,	.10	"	1.50
362.	Sodalite, ...	.20	"	4.00
683.	Soda Niter, . . .	.10	"	.40
459.	Sodium Mica., s., .	.25	"	1.00
90.	Sommarugaite, r.,			
768.	Sonomaite, r., . .			
487.	Spadaite, ...			
441.	Spangite, r., . . .			
732.	Spangolite, . . .			
273.	Spathic Iron, s., .	.10	"	3.00
96.	Spear Pyrites, v.,	.50	"	2.50
232.	Specular Iron, s.,	.10	"	20.00
93.	Sperrylite, ...	1.00	"	4.00
370.	Spessartite, v., . .	.50	"	2.00
643.	Sphærite, ...			
276.	Sphærocobaltite,	1.00	"	4.00
443.	Sphærostilbite, v.,	$ .30	to	$2.00
58.	Sphalerite, ...	.10	"	8.00
510.	Sphene, s., ...	.30	"	4.00
430.	Sphenoclase, ap.,			
273.	Spherosiderite, v.,	.20	"	2.00
500	Sphragidite, ap. .			
234.	Spinel, ...	.25	"	4.00
510.	Spinthere, v., . .			
554.	Spodiosite, ...			
327.	Spodumene, . . .	.15	"	1.00
549.	Staffelite, v., . . .	.25	"	1.00
270.	Stalactite, v., . .	.20	"	3.00
270.	Stalagmite, v., . .	.20	"	3.00
H.	Stanekite, ...			
58.	Stanniferous Blende, v.,			
84.	Stannite, ...	.30	"	2.00
462A.	Star Mica, s., . .	.10	"	1.00
210.	Star Quartz (Asteriated), v., . .			
231.	Star Sapphire, v.,	.50	"	5.00
698.	Stassfurtite, s., .	.20	"	2.50
428.	Staurolite, ...	.20	"	6.00
479.	Steatargillite, r., .			
484.	Steatite, s., . . .	.10	"	.40
437.	Steeleite, r., . . .	1.50	"	6.00
349.	Steenstrupine, r.,	1.00	"	5.00
45.	Steinmannite, . v.,			
N.	Stellarite, ...			
153.	Stephanite, . . .	.75	"	6.00
615.	Stercorite, ...			
458.	Sterlingite, v., . .			
56.	Sternbergite, . .			
222.	Stetefeldtite, r., .			
222.	Stibianite, r., . .			
583.	Stibiatil, r., . . .			
222.	Stibiconite, . . .	.25	"	1.00
222.	Stibioferrite, r., .			
N.	Stibiotantalite, .	2.00	"	10.00
28.	Stibnite, ...	.20	"	10.00
210.	Stibnite in Quartz, v., ...			
443.	Stilbite, ...	.20	"	2.00
474.	Stilpnomelane, . .	.30	"	1.25
719.	Stinkstone, v., . .	.20	"	.75
270.	Stinkstone, v.,. .			
496.	Stolpenite, v., . .			
817.	Stolzite, ...	2.00	"	15.00
325.	Strakonitzite, r., .			
335.	Stratopeite, r., . .			
248.	Stream Tin, v., .	.25	"	1.00
608.	Strengite, ...	.40	"	1.50
475.	Strigovite, ...			
389.	Stroganovite, r., .	.50	"	2.00
55.	Stromeyerite, . .	2.00	"	8.00
280.	Strontianite, . . .	.10	"	1.00
270.	Strontianocalcite, v.	.50	"	3.00
585.	Struvite, ...	.20	"	.75
509.	Stübelite, ap., . .			
41.	Stützite, ...			

768.	Stüvenite, r., . . .	$		$
141.	Stylotypite, . . .			
478.	Subdelessite, r., .			
H.	Succinellite, . . .			
H.	Succinite, ...	.50	to	$3.00
498.	Sulfatallophan, r.,			
N.	Sulfoborite, . . .			
211.	Sulfuricin, r., . .			
728.	Sulphohalite, . .	.		
3.	Sulphur, ...	.20	"	25.00
31.	Sulphurous Tetradymite, v., . . .	.50	"	2.00
N.	Sundtite, ...			
	Sunstone, s. v. of 316 and 317, . .	.75	"	2.50
734.	Susannite, r., . .			
693.	Sussexite, ...	.50	"	2.00
N.	Svabite, ...	.50	"	3.00
679.	Svanbergite, . . .			
N.	Sychnodymite, . .			
104.	Sylvanite, ...	.50	"	7.00
167.	Sylvite, ...	.15	"	1.25
598.	Symplesite, . . .	.75	"	3.00
579.	Synadelphite, . .			
756.	Syngenite, ...	.75	"	4.00
338.	Syntagmatite, v.,			
324.	Szaboite, v., . . .			
697.	Szaibelyite, . . .	.75	"	2.50
745.	Szmikite, ...			
212.	Tabasheer, r., . .			
468A.	Tabergite, r., . .	.75	"	3.00
210.	Tabular Quartz, v.,	.40	"	2.00
329.	" Spar, s., .	.20	"	1.50
202.	Tachhydrite, . . .	.20	"	.75
394.	Tachyaphaltite, r.,			
630.	Tagilite, ...			
484.	Talc, ...	.10	"	.40
549.	Talc-apatite, r., .			
479.	Talc-chlorite, r., .			
458.	Talcite, v., . . .			
484.	Talcoid, r., ...			
509.	Talcosite, ap., . .			
555.	Talktriplite, v., .			
193.	Tallingite, r., . .			
767.	Tamarugite, . . .			
320.	Tankite, v., . . .			
217.	Tantalic Ocher, r.,			
526.	Tantalite, ...	1.00	"	6.00
143.	Tapalpite, ...			
527.	Tapiolite, ...			
645.	Taranakite, r., . .			
727.	Tarapacaite, r., .			
45.	Targionite, v., . .			
277.	Tarnowitzite, v., .	.75	"	2.50
H.	Tasmanite, ...	.20	"	.75
748.	Tauriscite, r., . .			
575.	Tavistockite, . . .			
N.	Taylorite, ...			
675.	Taznite, r., . . .	$		$
750.	Tecticite, r., . . .			
31.	Telluric Bismuth, s., ...	.50	to	2.50
218.	Tellurite, ...			
7.	Tellurium, ...	.40	"	3.00
305.	Tengerite, ...			
149.	Tennantite, . . .	.50	"	3.00
230.	Tenorite, ...	.40	"	2.00
379.	Tephroite, ...	.30	"	2.00
381.	Tephrowillemite, v., ...			
500.	Teratolite, ap., . .			
389.	Terenite, r., . . .			
25.	Terrestrial Iron,	1.50	"	12.00
287.	Teschemacherite,			
435.	Tesselite, v., . . .			
31.	Tetradymite, . . .	.50	"	2.50
N.	Tetragophosphite,			
148.	Tetrahedrite, . .	.20	"	3.00
337.	Thalackerite, v., .			
N.	Thalenite, ...	1.50	"	6.00
502.	Thaumasite, . . .	.10	"	.50
716.	Thenardite, . . .	.20	"	3.00
294.	Thermonatrite, .			
481.	Thermophyllite, v.,			
821.	Thierschite, r., . .			
270.	Thinolite, r., . . .	.20	"	.75
273.	Thomäite, r., . .			
206.	Thomsenolite, . .	.40	"	3.00
456.	Thomsonite, . . .	.30	"	4.00
395.	Thorite, ...	.50	"	6.00
712.	Thorogummite, r.,			
406.	Thulite, v., ...	.20	"	1.00
473.	Thuringite, . . .	.20	"	.75
60.	Tiemannite, . . .	.75	"	3.00
210.	Tiger-eye, v., . .	.15	"	3.00
N.	Tilasite, ...			
224.	Tile Ore, v., . . .			
47.	Tilkerodite, r., . .			
19.	Tin, ...			
707.	Tincalconite, r., .			
84.	Tin Pyrites, s., . .	.30	"	2.00
248.	Tin Stone, s., . . .	.10	"	3.00
233.	Titanic Iron, s., .	.10	"	1.25
510.	Titanite, ...	.30	"	4.00
376.	Titan-olivine, r., .			
510.	Titanomorphite, v.,			
248.	Toad's-Eye Tin, v.,	.40	"	1.50
435.	Tobermorite, r., .			
173.	Tocornalite, r., .			
90.	Tombazite, r., . .			
397.	Topaz, ...	.15	"	10.00
370.	Topazolite, v., . .	.50	"	2.50
H.	Torbanite, ...	.20	"	.75
659.	Torbernite, . . .	.50	"	4.00
481.	Totaigite, r., . . .			
210.	Touchstone, v., . .	.15	"	.50
426.	Tourmaline, . . .	.20	"	25.00

269.	Transvaalite, ap.,	$		$
370.	Trautwinite, r.,			
325.	Traversellite, v.,	.20	to	.75
270.	Travertine, v.,	.10	"	.75
2.	Tremenheerite, r.,			
338.	Tremolite, v.,	.20	"	1.00
596.	Trichalcite,			
211.	Tridymite,	.40	"	2.00
380.	Trimerite,			
H.	Trinkerite,			
543.	Triphylite,	.30	"	2.00
555.	Triplite,	.75	"	3.00
556.	Triploidite,	.50	"	2.00
212.	Tripoli Slate, v.,			
212.	Tripolite, v.,	.10	"	.40
N.	Tripuhyite,			
350.	Tritomite,			
665.	Trögerite,			
73.	Troilite,	2.00	"	8.00
645.	Trolleite, r.,			
299.	Trona,	.25	"	1.00
381.	Troostite, v.,	.50	"	4.00
513.	Tscheffkinite,	.75	"	2.50
316.	Tschermakite, v.,			
765.	Tschermigite,	.30	"	1.25
492.	Tuesite, v.,			
270.	Tufa, Calc v.,	.10	"	.50
220.	Tungstite,			
255.	Turgite,	.20	"	.75
642.	Turquois,	.30	"	2.00
635.	Tyrolite,	.40	"	1.50
182.	Tysonite,	1.00	"	4.00
				!
233.	Uddevallite, v.,			
411.	Uigite, r.,			
H.	Uintahite,	.10	"	.40
708.	Ulexite,	.15	"	.75
92.	Ullmannite,	.75	"	5.00
N.	Umangite,			
807.	Uraconite, r.,	.40	"	3.00
325.	Uralite, r.,			
338.	Uralite, v.,			
409.	Uralorthite, v.,			
711.	Uraninite,	.50	"	6.00
711.	Uranniobite, v.,			
807.	Uranochalcite, r.,			
663.	Uranocircite,			
503.	Uranophane,	.75	"	2.50
807.	Uranopilite,			
713.	Uranosphærite,			
662.	Uranospinite,			
307.	Uranothallite,			
395.	Uranothorite, v			
503.	Uranotil, s.,	.75	"	2.50
N.	Urbanite,			
H.	Urpethite,			
786.	Utahite,	.40	"	1.50
N.	Utahlite,			
370.	Uvarovite, v.,	.75	"	3.00
480.	Vaalite, r.,	$ .40	to	$1.50
216.	Valentinite,	.40	"	1.50
N.	Valleite,	.75	"	2.50
108.	Valeriite, ap.,	.75	"	3.00
217.	Vanadic Ocher, r.,			
552.	Vanadinite,	.30	"	5.00
567.	Vanadiolite, r.,			
463.	Vanadium Mica., s.,	1.00	"	7.00
423.	Vanuxemite, r.,	.40	"	1.50
78.	Variegated Copper Ore., s.,	.30	"	5.00
611.	Variscite,	.25	"	3.00
269.	Varvicite, r.,			
727.	Vauquelinite,	1.50	"	5.00
467.	Venasquite, v.,			
509.	Venerite, ap.,			
481.	Verd-Antique, v.,	.30	"	2.00
270.	Verd-antique Marble, v.,			
480.	Vermiculite, r.,	.20	"	.75
	Vermiculites, following 480.			
211.	Vestan, r.,			
393.	Vesuvianite,	.20	"	2.50
637.	Veszelyite,			
323.	Victorite, v.,			
529.	Vietinghofite, r.,			
376.	Villarsite, r.,			
325.	Violan, v.,	.30	"	1.25
479.	Viridite, r.,			
755.	Vitriol, Blue, s.,	.30	"	1.50
597.	Vivianite,	.50	"	2.00
807.	Voglianite, r.,			
309.	Voglite,	1.25	"	5.00
462.	Voigtite, r.,			
633.	Volborthite,			
222.	Volgerite, r.,	1.50	"	7.00
796.	Voltaite,			
108.	Voltzite,			
723.	Vulpinite, v.,			
269.	Wad, r.,	.10	"	.75
423.	Wagite, v.,			
553.	Wagnerite,	.50	"	3.00
H.	Walchowite,			
338.	Waldheimite, r.,			
330.	Walkerite, v.,			
666.	Walpurgite,	.50	"	2.50
306.	Walthérite, r.,			
465A.	Waluewite, v.,			
622.	Wapplerite,			
N.	Wardite,	.75	"	3.00
740.	Waringtonite, v.,			
126.	Warrenite,			
700.	Warwickite,	.25	"	1.00
233.	Washingtonite, v.,	.20	"	.75
409.	Wasite, r.,			
223.	Water,			
763.	Wattevillite,			

639.	Wavellite, ...	$ .20	to	$3.00
N.	Webnerite, . . .			
33.	Wehrlite, ...			
285.	Weibyeïte, r., . .			
313.	Weissigite, v., . .			
N.	Wellsite, ...			
387.	Wernerite, ...	.15	"	4.00
791.	Werthemanite, r.,			
399.	Westanite, r., . .			
N.	Whartonite, . . .			
H.	Wheelerite, . . .			
136.	Wheel Ore, s., . .	.50	"	4.00
821.	Whewellite, . . .	2.00	"	9.00
216.	White Antimony, s.,	.40	"	1.50
213.	White Arsenic, s.,			
281.	White Lead Ore, s.,	.30	"	12.00
458.	White Mica, s., .	.10	"	2.00
96.	White Pyrites, s.,	.10	"	2.50
39.	Whitneyite, . . .			
567.	Wicklowite, r., . .			
480.	Willcoxite, r., . .			
331.	Willemite, ...	.25	"	3.00
431.	Williamsite, . v., .	.10	"	1.50
N.	Willyamite, . . .			
389.	Wilsonite, r., . . .	.50	"	2.00
458.	Wilsonite, r., . . .			
370.	Wiluite, v., ...	.50	"	2.00
791.	Winebergite, r., .			
269.	Winklerite, ap., .			
701.	Winkworthite, r.,	.40	"	1.50
407.	Withamite, v., . .	.75	"	2.50
279.	Witherite, ...	.10	"	6.00
137.	Wittichenite, . . .	1.50	"	5.00
333.	Wöhlerite, ...	.50	"	3.00
500.	Wolchonskoite, ap.,			
103.	Wolfachite, . . .			
812.	Wolfram, s., . . .	.50	"	3.00
812.	Wolframite, . . .	.50	"	3.00
329.	Wollastonite, . .	.20	"	1.50
H.	Wollongongite, .	.10	"	.50
212.	Wood Opal, v., . .	.20	"	12.00
	Wood, Silicified (Petrified) v., . 210, 212, ...	.15	"	12.00
248.	Wood Tin, v., . .	.50	"	2.50
779.	Woodwardite, r., .	.75	"	3.00
399.	Wörthite, v., . . .			
818.	Wulfenite, ...	.30	"	8.00
H.	Wurtzilite, ...	.20	"	.75
69.	Wurtzite, ...	.30	"	1.25
572.	Xantharsenite, r.,			
160.	Xanthoconite, . .	.50	"	2.00
428.	Xantholite, v., . .	$		$
465A.	Xanthophyllite, .			
409.	Xanthorthite, . v.,			
260.	Xanthosiderite, .	.50	to	2.50
784.	Xanthosiderite, s.,	.30	"	2.00
399.	Xenolite, v., . . .			
536.	Xenotime, ...	.50	"	4.00
N.	Xiphonite, ...			
435.	Xonotlite, r., . .			
435.	Xylochlore, v., . .			
H.	Xyloretinite, . . .			
509.	Xylotile, ap., . .			
259.	Yellow Ocher, v., .	.10	"	.40
108.	Youngite, ap., . .			
370.	Yttergarnet, v., .			
405.	Yttrialite, ...			
209.	Yttrocerite, . . .			
712.	Yttrogummite, r.,			
528.	Yttrotantalite, . .	.40	"	1.50
	Yttrotitanite, . .			
303.	Zaratite, ...	.30	"	1.50
	Zeolites, 436-457, .			
613.	Zepharovichite, .			
619.	Zeugite, v., . . .			
660.	Zeunerite, ...	1.00	"	4.00
426.	Zeuxite, r., . . .			
H.	Zietrisikite, . . .			
173.	Zimapanite, r., .			
12.	Zinc, ...			
805.	Zincaluminite, . .			
58.	Zinc Blende, s., .	.10	"	8.00
228.	Zincite, ...	.30	"	2.50
270.	Zincocalcite, v., .			
236.	Zinc-Spinel, s., . .	.50	"	7.00
749.	Zinc Vitriol, s., .	.40	"	1.50
289.	Zinkazurite, r., .			
114.	Zinkenite, ...	.75	"	3.00
723.	Zinkosite, ...			
461.	Zinnwaldite, . . .	.25	"	2.00
807.	Zippeite, r., . . .			
394.	Zircon, ...	.15	"	4.00
N.	Zirkelite, ...			
264.	Zirlite, r., ...			
481.	Zöblitzite, r., . .			
406.	Zoisite, ...	.20	"	3.00
457.	Zonochlorite, ap.,	.25	"	3.00
52.	Zorgite, ...	.50	"	2.00
369.	Zunyite, ...	.40	"	1.50
555.	Zwieselite, v., . .			
316.	Zygadite, v., . . .	.75	"	2.50

LIST OF ALL KNOWN MINERALS CLASSIFIED ACCORDING TO DANA.

("*System of Mineralogy*," Sixth Edition, 1892)

WITH COMPLETE SUPPLEMENT.

The first synopsis of Dana's *System of Mineralogy* was published in the *Naturalist's Agency Catalogue*, issued by us in 1876. Subsequently, similar lists appeared elsewhere. The original synopsis, or "Table of Species," gave in a condensed form the physical and chemical characters of species, but did not mention varieties or sub-species.

In the present numerical list, the number and name of every distinct species is given in **black type,** and following, the crystallization and the chemical composition in words and symbols. The old dualistic formula is employed, being generally preferred—*e. g.*, in comparing Stephanite, $5Ag_2S.Sb_2S_3$, with Polybasite, $9Ag_2S.Sb_2S_3$, their relationship and composition are better explained than when written Ag_5SbS_4 and Ag_9SbS_6.

The varieties and sub-species, or "related compounds," are given in *italics*. The list is intended to include all varieties of any importance, although many obscure or merely local names are omitted. The enumeration of pseudomorphs and other alterations constitutes another new and desirable feature. The Hydrocarbon compounds are briefly described.

THE SUPPLEMENT notices all minerals not described in the main text of Dana's *System*. The original publications were carefully reviewed and these references, dating back to the middle of 1891, are cited.

Serving as a check-list and as a useful work of reference, it is confidently hoped that this list will meet with the universal approval accorded by students to the earlier edition. The thanks of the compiler are due to Prof. E. S. Dana for valuable suggestions, kindly made during the preparation of the manuscript.

INDEX.—The position of any mineral in the following list may be found by referring to the Alphabetical Price List and Index in the preceding pages.

GENERAL CLASSIFICATION

FROM

The System of Mineralogy

OF

JAMES DWIGHT DANA.

Sixth Edition (1892).

By EDWARD SALISBURY DANA.

I. NATIVE ELEMENTS.

II. SULPHIDES, SELENIDES, TELLURIDES, ARSENIDES, ANTIMONIDES.

III. SULPHO-SALTS—SULPHARSENITES, SULPHANTIMONITES, SULPHOBISMUTHITES.

IV. HALOIDS—CHLORIDES, BROMIDES, IODIDES; FLUORIDES.

V. OXIDES.

VI. OXYGEN-SALTS.

1. Carbonates.
2. Silicates, Titanates.
3. Niobates, Tantalates.
4. Phosphates, Arsenates, Vanadates; Antimonates. Nitrates.
5. Borates. Uranates.
6. Sulphates, Chromates, Tellurates.
7. Tungstates, Molybdates.

VII. SALTS OF ORGANIC ACIDS—OXALATES, MELLATES, Etc.

VIII. HYDROCARBON COMPOUNDS.

NEW MINERALS—A SUPPLEMENT COMPILED FROM RECENT SCIENTIFIC LITERATURE.

I. NATIVE ELEMENTS.

I. NON-METALS.

1. CARBON GROUP.

1. Diamond. Isometric; pure carbon, C.
VARIETIES :—*Ordinary Crystals, Bort, Carbonado.*
RELATED :—*Cliftonite* (*meteoric*).
2. Graphite. Rhombohedral; pure carbon, C.
IMPURE FORMS :—*Tremenheerite, Graphitoid, Schungite.*

2. SULPHUR GROUP.

3. Sulphur. Orthorhombic; pure sulphur, S.
4. Selensulphur. Orthorhombic (?); a sulphur containing selenium.
5. Selenium. Occurrence in nature doubtful.

II. SEMI-METALS.

3. TELLURIUM-ARSENIC GROUP.

6. Selen-Tellurium. Massive; tellurium containing selenium.
7. Tellurium. Rhombohedral; tellurium, Te.
8. Arsenic. Rhombohedral; arsenic, As.
RELATED :—*Arsenolamprite.*
9. Allemontite. Rhombohedral; arsenic containing antimony.
RELATED :—*Antimonial arsenic.*
10. Antimony. Rhombohedral; antimony containing sometimes silver, iron or arsenic, Sb.
11. Bismuth. Rhomb.; pure bismuth, with occasional traces of arsenic, etc., Bi.
12. Zinc. Rhombohedral; zinc, Zn.

III. METALS.

4. GOLD GROUP.

13. Gold. Isometric; gold usually alloyed with silver, Au.
VARIETIES :—
1. *Ordinary,*
2. *Electrum* (*argentiferous*),
3. *Porpezite* (*palladium gold*),
4. *Rhodite* (*rhodium gold*),
5. *Bismuth gold.*
RELATED :—*Gold amalgam.*
14. Silver. Isometric; silver with some gold, copper, etc., Ag.
VARIETIES :—
1. *Ordinary :*
(a) *crystallized,* (c) *arborescent,* 2. *Küstelite* (*auriferous*),
(b) *filiform,* (d) *massive,* 3. *Cupriferous.*
ALTERS TO :—Cerargyrite, Argentite, Red Silver Ore, Stephanite.
15. Copper. Isom.; pure copper often containing some silver, bismuth, etc., Cu.
ALTERS TO :—Cuprite, Azurite, Malachite.
16. Mercury. Liquid; pure mercury with sometimes a little silver, Hg.
17. Amalgam. Isometric; silver containing mercury.
VARIETIES :—1. *Ordinary Amalgam,* 2. *Arquerite,* 3. *Kongsbergite.*
18. Lead. Isometric; nearly pure lead, Pb.
19. Tin. Rounded grains; nearly pure tin, Sn.

5. PLATINUM—IRON GROUP.

20. Platinum. Isom.; platinum alloyed with iron, iridium, etc., Pt.
VARIETIES :—1. *Non-magnetic (ordinary)*, 2. *Magnetic.*
21. Iridium. Isometric; iridium; Ir. with platinum.
22. Iridosmine. Rhombohedral; iridium with osmium.
VARIETIES :—1. *Nevyanskite*, 2. *Siserskite.*
23. Palladium. Isometric; palladium alloyed with platinum and iridium, Pa.
24. Allopalladium. Rhombohedral; palladium, Pd.
25. Iron. Isom.; generally about 90 per cent. pure iron, with nickel, cobalt, etc.
VARIETIES :—

1. *Terrestrial :—*
(a) *nearly pure (Greenland),*
(b) *nickeliferous, awaruite.*

2. *Meteoric :—*
(a) *Siderites,*
(b) *Siderolites,*
(c) *Meteoric Stones.*

IRON COMPOUNDS FROM METEORIC IRONS :—*Edmonsonite, Chalypite, Cohenite, Schreibersite, Rhabdite.*

II. SULPHIDES, SELENIDES, TELLURIDES, ARSENIDES, ANTIMONIDES.

I. SULPHIDES, SELENIDES, TELLURIDES OF THE SEMI-METALS.

1. REALGAR GROUP. RS. Monoclinic.

26. Realgar. Monoclinic; arsenic monosulphide, AsS.
ALTERS TO :—Orpiment, Arsenolite.

2. STIBNITE GROUP. R_2S_3. Orthorhombic.

27. Orpiment. Orthorhomic (?); arsenic trisulphide, As_2S_3.
RELATED :—*Dimorphite.*
28. Stibnite. Orthorhombic; antimony trisulphide, Sb_2S_3.
RELATED :—*Metastibnite.*
29. Bismuthinite. Orthorhombic; bismuth trisulphide, Bi_2S_3.
RELATED :—*Bolivite.*
30. Guanajuatite. Orthorhombic; bismuth selenide, Bi_2Se_3.
RELATED :—*Silaonite.*
31. Tetradymite. Rhombohedral; bismuth and tellurium.
VARIETIES :—1. *Free from Sulphur*, 2. *Sulphurous.*
32. Joseïte. Laminated; bismuth and tellurium with some sulphur and selenium.
33. Wehrlite. Foliated; bismuth and tellurium with some sulphur and silver.

3. MOLYBDENITE GROUP.

34. Molybdenite. Hexagonal (?); molybdenum disulphide, MoS_2.

II. SULPHIDES, SELENIDES, TELLURIDES, ARSENIDES, ANTIMONIDES OF THE METALS.

A. BASIC DIVISION.

35. Dyscrasite. Orthorhombic; a silver antimonide.
ALTERS TO :—Pyrargyrite, Silver.
RELATED :—*Arsenical Silver, Macfarlanite, Huntilite, Animikite, Arsenargentite.*
36. Horsfordite. Massive; copper antimonide, Cu_6Sb.(?)
37. Domeykite. Massive; copper arsenide, Cu_3As.
RELATED :—*Condurrite, Orileyite.*
38. Algodonite. Massive; copper arsenide, Cu_6As.

39. Whitneyite. Massive; copper arsenide, Cu_9As.
40. Chilenite. Amorphous; silver bismuthide, perhaps Ag_5Bi.
41. Stützite. Hexagonal(?); a silver telluride, perhaps Ag_4Te.

B. MONOSULPHIDES, SELENIDES, TELLURIDES, ETC.

1. GALENA GROUP.—RS. Isometric, holohedral.

42. Argentite. Isometric; silver sulphide, Ag_2S.
RELATED :—*Jalpaite.*
43. Hessite. Isometric; silver telluride, Ag_2Te.
44. Petzite. Massive; a silver and gold telluride, $(Ag,Au)_2Te$.
45. Galena. Isometric; lead sulphide, PbS.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystallized,*
   (b) *Fibrous,*
   (c) *Clearable,*
   (d) *Granular,*
   (e) *Cryptocrystalline,*
2. *Argentiferous,*
3. *Targionite,*
4. *Johnstonite,*
5. *Bleischweif,*
6. *Steinmannite.*

ALTERS TO :—Minium, Cerussite, Wulfenite, Chalcocite, Quartz, Pyrite, Calamine, Anglesite, Pyromorphite, Tetrahedrite, Rhodochrosite, Limonite, Pistomesite.
RELATED :—*Huascolite, Alisonite, Cuproplumbite.*
46. Altaite. Isometric; lead telluride, PbTe.
RELATED :—*Henryite.*
47. Clausthalite. Isometric; lead selenide, PbSe.
VARIETIES :—1. *Ordinary,* 2. *Tilkerodite* (*cobaltiferous*).
48. Naumannite. Isom.; silver selenide, Ag_2Se, or lead and silver $(Ag_2,Pb)Se$.
49. Berzelianite. Massive; copper selenide, Cu_2Se.
50. Lehrbachite. Massive; lead and mercury selenide, PbSe with Hg_2Se.
51. Eucairite. Isometric; copper and silver selenide, $Cu_2Se.Ag_2Se$.
52. Zorgite. Massive; copper and lead selenide in varying proportion.
53. Crookesite. Massive; copper and thallium selenide, with silver, $(Cu,Tl,Ag)_2Se$.

2. CHALCOCITE GROUP. RS. Orthorhombic.

54. Chalcocite. Orthorhombic; cuprous sulphide, Cu_2S.
ALTERS TO :—Chalcopyrite, Covellite, Bornite, Melaconite.
RELATED :—*Harrisite.*
55. Stromeyerite. Orthorhombic; silver and copper sulphide, $(Ag,Cu)_2S$.
56. Sternbergite. Orthorhombic; silver and iron sulphide, $AgFe_2S_3$.
VARIETIES :—1. *Sternbergite,* 2. *Frieseite.*
RELATED :—*Argentopyrite, Argyropyrite.*
57. Acanthite. Orthorhombic; silver sulphide, Ag_2S.
RELATED :—*Daleminzite.*

3. SPHALERITE GROUP. RS. Isometric, tetrahedral.

58. Sphalerite. Isometric; zinc sulphide, ZnS.

VARIETIES :—

1. *Ordinary* :—
   (a) *brown or black,*
   (b) *Cleiophane,*
   (c) *Ruby Blende.*
2. *Ferriferous* :—
   (a) *Marmatite,*
   (b) *Christophite.*
3. *Cadmiferous* :— (*Pribramite.*)
4. *Mercurial.*
5. *Stanniferous.*

59. Metacinnabarite. Isometric; mercuric sulphide, HgS.
RELATED :—*Guadalcazarite, Levigtianite.*
60. Tiemannite. Isometric; mercuric selenide, HgSe.
61. Onofrite. Massive; mercury sulpho-selenide, Hg(S,Se).
62. Coloradoite. Massive; mercuric telluride, HgTe.
63. Alabandite. Isometric; manganese sulphide, MnS.
64. Oldhamite. Isometric; calcium sulphide, CaS. (meteoric).
RELATED :—*Osbornite* (*meteoric*).
65. Pentlandite. Isometric; iron and nickel sulphide, (FeNi)S.

4. CINNABAR—WURTZITE—MILLERITE GROUP. Rhombohedral or Hexagonal.

66. Cinnabar. Rhombohedral; mercuric sulphide, HgS.
VARIETIES:—
1. *Ordinary*:—
(a) *Crystallized*, (c) *Earthy*, 2. *Hepatic.*
(b) *Massive*,

67. Covellite. Hexagonal; cupric sulphide, CuS.
RELATED:—*Cantonite.*

68. Greenockite. Hexagonal; cadmium sulphide, CdS.

69. Wurtzite. Hexagonal; zinc sulphide, ZnS.
RELATED:—*Erythrozincite.*

70. Millerite. Rhombohedral; nickel sulphide, NiS.
RELATED:—*Jaipurite.*

71. Niccolite. Hexagonal; nickel arsenide, NiAs.

72. Breithauptite. Hexagonal; nickel antimonide, NiSb.

73. Troilite. Massive; iron sulphide, FeS (meteoric).

74. Pyrrhotite. Hexagonal; iron sulphide, containing sometimes 5 per cent. nickel, $Fe_{11}S_{12}$.
ALTERS TO:—Pyrite, Siderite, Limonite.
RELATED:—*Kroeberite, Horbachite.*

C. INTERMEDIATE DIVISION.

GROUP 1.

75. Polydymite. Isometric; nickel sulphide, Ni_4S_5(?).
RELATED:—*Grünauite.*

76. Beyrichite. Prismatic; a nickel sulphide, Ni_3S_4(?).

77. Melonite. Hexagonal; a nickel telluride, Ni_2Te_3(?).

GROUP 2.

78. Bornite. Isometric; copper and iron sulphide, Cu_3FeS_3, varying.
RELATED:—*Castillite.*

79. Linnæite. Isometric; cobalt sulphide, Co_3S_4.
VARIETIES:—1. *Ordinary*, 2. *Siegenite.*

80. Daubreelite. Massive; chromium and iron sulphide, $FeS.Cr_2S_3$.

81. Cubanite. Isometric; iron and copper sulphide, $CuFe_2S_4$.
RELATED:—*Chalcopyrrhotite.*

82. Carrollite. Isometric; copper and cobalt sulphide, $CuS.Co_2S_3$.

83. Chalcopyrite. Tetragonal; copper and iron sulphide, $CuFeS_2$, varying.
ALTERS TO:—Malachite, Chrysocolla, Chalcocite, Tetrahedrite, Covellite, Melaconite, Iron oxide, Sulphate.
RELATED:—*Barnhardite, Homichlin, Ducktownite.*

84. Stannite. Massive; tin, copper, iron, and often zinc sulphide, perhaps $Cu_2S.FeS.SnS_2$.

D. DISULPHIDES, DIARSENIDES, ETC.

1. PYRITE GROUP. RS_2, RAs_2, RSb_2. Isometric, pyritohedral.

85. Pyrite. Isometric; iron disulphide, FeS_2(?).
ALTERS TO:—Limonite, Green vitriol, Göthite, Hematite, Quartz, Graphite.

86. Hauerite. Isometric; manganese disulphide, MnS_2.

87. Smaltite. Isometric; cobalt diarsenide, $CoAs_2$.
NOTE.—Smaltite and Chloanthite graduate chemically into each other.

88. Chloanthite. Isometric; nickel diarsenide, $NiAs_2$.

89. Cobaltite. Isometric; cobalt sulph-arsenide, $CoS_2.CoAs_2$.
VARIETIES:—1. *Ordinary*, 2. *Ferrocobaltite.*

90. Gersdorffite. Isometric; nickel sulph-arsenide, $NiS_2.NiAs_2$.
RELATED:—*Sommarugaite, Tombazite.*

91. Corynite. Isometric; nickel sulph-antimon-arsenide, Ni(As,Sb)S.

92. Ullmannite. Isometric; nickel sulph-antimonide, $NiS_2.NiSb_2$.

93. Sperrylite. Isometric; platinum arsenide, $PtAs_2$.

94. Laurite. Isometric; ruthenium sulphide (and osmium 3.03 per cent.), RuS_2.

95. Skutterudite. Isometric; cobalt arsenide, $CoAs_3$.

2. MARCASITE GROUP. RS_2, Etc. Orthorhombic.

96. Marcasite. Orthorhombic; iron sulphide, FeS_2.

VARIETIES:—

1. *Radiated,*
2. *Cockscomb Pyrites,*
3. *Spear Pyrites,*
4. *Capillary Pyrites,*
5. *Hepatic,*
6. *Cellular,*
7. *Arsenical,*
8. *Stalactitic.*

ALTERS TO:—Limonite, Bournonite, Magnetite, Pyrite, Chalcopyrite, Sphalerite.

97. Löllingite. Orthorhombic; iron diarsenide, $FeAs_2$.

VARIETIES:—

1. *Löllingite,*
2. *Leucopyrite,*
3. *Geyerite,*
4. *Glaucopyrite, cobaltiferous.*

RELATED:—*Pacite.*

98. Arsenopyrite. Orthorhombic; iron sulph-arsenide, FeAsS.
VARIETIES:—1. *Ordinary,* 2. *Danaite (cobaltiferous),* 3. *Niccoliferous.*
RELATED:—*Crucite.*

99. Safflorite. Orthorhombic; cobalt diarsenide, $CoAs_2$.

100. Rammelsbergite. Orthorhombic; essentially nickel diarsenide, $NiAs_2$.

101. Glaucodot. Orthorhombic; cobalt and iron sulph-arsenide, (CoFe)AsS.

102. Alloclasite. Orthorh.; cobalt (and iron) sulph-arsen-bismuthide, Co(As,Bi)S.

103. Wolfachite. Orthorhombic; probably Ni(As,Sb)S.

3. SYLVANITE GROUP.

104. Sylvanite. Monoclinic; gold and silver telluride, $(AuAg)Te_2$.
RELATED:—*Müllerine.*

105. Krennerite. Orthorhombic; a gold and silver telluride.
RELATED:—*Calaverite.*

106. Nagyagite. Orthorhombic; lead and gold sulpho-telluride, with antimony.
RELATED:—*Silberphyllinglanz.*

OXYSULPHIDES.

107. Kermesite. Monoclinic; antimony oxysulphide, $2Sb_2S_3.Sb_2O_3$.

108. Voltzite. Globules; zinc oxysulphide, Zn_3S_4O.

APPENDIX TO SULPHIDES, ETC.

Arsenotellurite,
Bolivianite,
Kaneite,
Plakodin,
Copper and Silver Sulphide,
Plumbomanganite,
Plumbostannite,
Valleriite,
Youngite.

III. SULPHO-SALTS.

I. SULPHARSENITES, SULPHANTIMONITES, ETC.

A. ACIDIC DIVISION.

109. Livingstonite. Prismatic (?); mercury; sulph-antimonite, $HgS.2Sb_2S_3$.

110. Guejarite. Orthorhombic; copper sulphantimonite, $Cu_2S.2Sb_2S_3$.

111. Chiviatite. Foliated; lead sulpho-bismuthite, $2PbS.3Bi_2S_3$.

112. Cuprobismutite. Prismatic crystals; copper sulpho-bismuthite, $3Cu_2S.4Bi_2S_3$.
RELATED:—*Dognacskaite.*

113. Rezbanyite. Massive; lead sulpho-bismuthite, $4PbS.5Bi_2S_3$.

B. META-DIVISION.

ZINKENITE GROUP. $RS(As,Sb,Bi)_2S_3$. Orthorhombic.

114. Zinkenite. Orthorhombic; lead sulphantimonite, $PbS.Sb_2S_3$.

115. Sartorite. Orthorhombic; lead sulpharsenite, $PbS.As_2S_3$.

116. Emplectite. Orthorhombic; copper sulphobismuthite, $Cu_2S.Bi_2S_3$.
117. Chalcostibite. Orthorhombic; copper sulphantimonite, $Cu_2S.Sb_2S_3$.
118. Galenobismutite. Columnar; lead sulphobismuthite, $PbS.Bi_2S_3$.
VARIETIES:—1. *Ordinary*, 2. *Argentiferous* (*Alaskaite*), 3. *Seleniferous.*
119. Berthierite. Prismatic; iron sulphantimonite, $FeS.Sb_2S_3$. (?)
120. Matıldite. Prismatic; silver sulphobismuthite, $Ag_2S.Bi_2S_3$.
RELATED:—*Plenargyrite.*
121. Miargyrite. Monoclinic; silver sulphantimonite, $Ag_2S.Sb_2S_3$.

C. INTERMEDIATE DIVISION.

122. Plagionite. Monoclinic; lead sulphantimonite, $5PbS.4Sb_2S_3$ (?).
123. Binnite. Isometric; copper sulpharsenite, $3Cu_2S.2As_2S_3$ (?).
124. Klaprotholite. Orthorhombic; copper suphobismuthite, $3Cu_2S.2Bi_2S_3$.
125. Schirmerite. Massive; lead and silver sulphobismuthite, $3(Ag_2,Pb)S.2Bi_2S_3$.
126. Warrenite. Acicular; lead sulphantimonite, $3PbS.2Sb_2S_3$.

* JAMESONITE GROUP. $2RS.(As,Sb,Bi)_2S_3$. Orthorhombic.

127. Dufrenoysite. Orthorhombic; lead sulpharsenite, $2PbS.As_2S_3$.
128. Cosalite. Orthorhombic; lead sulphobismuthite, $2PbS.Bi_2S_3$.
129. Schapbachite. Orthorhombic (?); lead and silver sulphobismuthite, $PbS.Ag_2S.Bi_2S_3$.
130. Jamesonite. Orthorhombic; lead sulphantimonite, $2PbS.Sb_2S_3$.
ALTERS TO:—Bindheimite.
131. Kobellite. Massive; lead sulphantimon-bismuthite, $2PbS.(Bi,Sb)_2S_3$.
132. Brongniardıte. Isom.; lead and silver, sulphantimonite, $PbS.Ag_2S.Sb_2S_3$.
133. Semseyite. Monoclinic; lead sulphantimonite, $7PbS.3Sb_2S_3$. (?)
134. Diaphorite. Orthorh.; lead and silver sulphantimonite, $5(Pb,Ag_2)S.2Sb_2S_3$.
135. Freieslebenite. Monoc.; lead and silver sulphantimonite, $5(Pb,Ag_2)S.2Sb_2S_3$.

D. ORTHO DIVISION.

BOURNONITE GROUP. $3RS.(As,Sb,Bi)_2S_3$. Orthorhombic.

136. Bournonite. Orthorh.; lead and copper sulphantimonite, $3(Pb,Cu_2)S.Sb_2S_3$.
ALTERS TO:—Cerussite, Azurite, Malachite, Wölchite.
137. Wittichenite. Orthorhombic; copper sulphobismuthite, $3Cu_2S.Bi_2S_3$.
138. Aikinite. Orthorh.; lead and copper sulphobismuthite, $3(Pb,Cu_2)S.Bi_2S_3$.
139. Boulangerite. Massive; lead sulphantimonite, $3PbS.Sb_2S_3$.
140. Lillianite. Massive; lead sulphobismuthite, $3PbS.Bi_2S_3$.
141. Stylotypite. Orthorhombic; copper, silver, and iron sulphantimonite, $3(Cu_2,Ag_2,Fe)S.Sb_2S_3$.
RELATED:—*Dürfeldtite.*
142. Guitermanite. Massive; lead sulpharsenite, $10PbS.3As_2S_3$.
143. Tapalpite. Massive; bismuth and silver sulpho-telluride, $3Ag_2(S,Te).Bi_2(S,Te)_3$ (?).

PYRARGYRITE GROUP. $3Ag_2S.(As,Sb)_2S_3$. Rhombohedral, hemimorphic.

144. Pyrargyrite. Rhombohedral; silver sulphantimonite, $3Ag_2S.Sb_2S_3$.
ALTERS TO:—Argentite.
145. Proustite. Rhombohedral; silver sulpharsenite, $3Ag_2S.As_2S_3$.
146. Pyrostilpnite. Monoclinic; silver sulphantimonite, $3Ag_2S.Sb_2S_3$.
147. Rittingerite. Monoclinic; arsenic, selenium, and silver.

E. BASIC DIVISION.

TETRAHEDRITE GROUP. $4RS.(Sb,As)_2S_3$. Isometric, tetrahedral.

148. Tetrahedrite. Isometric; copper sulphantimonite, $4Cu_2S.Sb_2S_3$.
VARIETIES:—
1. *Ordinary*,
2. *Argentiferous* (*Freibergite*),
3. *Mercurial* (*Schwatzite*),
4. *Plumbiferous.*

ALTERS TO:—Chalcopyrite, Malachite, Azurite, Amalgam, Bournonite, Erythrite, Cinnabar, Covellite.
NOTE.—Tetrahedrite and Tennantite graduate chemically into each other.

149. Tennantite. Isometric; copper sulpharsenite, 4 $CuS.As_2S_3$.
VARIETIES:—1. *Ordinary*, 2. *Sandbergerite*, 3. *Fredricite*, 4. *Rionite*, 5. *Annivite*
RELATED:—*Nepaulite, Fieldite, Polytelite, Clayite.*
150. Jordanite. Orthorhombic; lead sulpharsenite, $4PbS.As_2S_3$.
151. Meneghinite. Orthorhombic; lead sulphantimonite, $4PbS.Sb_2S_3$.
152. Geocronite. Orthorhombic; lead sulphantimonite, $5PbS.Sb_2S_3$.
153. Stephanite. Orthorhombic; silver sulphantimonite, $5Ag_2S.Sb_2S_3$.
ALTERS TO:—Silver.
154. Kilbrickenite. Massive; lead sulphantimonite, perhaps $6PbS.Sb_2S_3$.
155. Beegerite. Isometric (?); lead sulphobismuthite, $6PbS.Bi_2S_3$.
RELATED:—*Richmondite.*
156. Polybasite. Orthorhombic; silver sulphantimonite, $9Ag_2S.Sb_2S_3$.
ALTERS TO:—Stephanite, Pyrite.
157. Polyargyrite. Isometric; silver sulphantimonite, $12Ag_2S.Sb_2S_3$.

II. SULPHARSENATES, SULPHANTIMONATES, ETC.

ENARGITE GROUP.

158. Enargite. Orthorhombic; copper sulpharsenate, $3Cu_2S.As_2S_5$.
RELATED:—*Lautite, Clarite, Luzonite.*
NOTE.—Enargite and Famatinite gradnate chemically toward each other.
159. Famatinite. Orthorhombic; copper sulphantimonate, $3Cu_2S.Sb_2S_5$.
160. Xanthoconite. Rhombohedral; silver sulpharsenate, $3Ag_2S.As_2S_5$.
161. Epiboulangerite. Orthorhombic (?); lead sulphantimonate, $3PbS.Sb_2S_5$.
162. Epigenite. Orthorh.; copper and iron sulpharsenate, $4Cu_2S.{}_3FeS.As_2S_5$(?).
RELATED:—*Regnolite.*
163. Argyrodite. Monoclinic; silver and germanium sulphide, $3\ Ag_2S.GeS_2$.

IV. HALOIDS.—CHLORIDES, BROMIDES, IODIDES, FLUORIDES.

I. ANHYDROUS CHLORIDES, BROMIDES, IODIDES; FLUORIDES.

CALOMEL GROUP. $\overset{I}{R}_2Cl_2$.

164. Calomel. Tetragonal; mercurous chloride, Hg_2Cl_2.
RELATED:—*Mercuric chloride.*
165. Nantokite. Isometric; cuprous chloride, Cu_2Cl_2.

HALITE GROUP. $\overset{I}{R}Cl$, etc. Isometric.

166. Halite. Isometric; sodium chloride, NaCl.
ALTERS TO:—Anhydrite, Polyhalite, Dolomite, Hematite, Gypsum, Celestite, Quartz, Pyrite.
RELATED:—*Martinsite, Hydrohalite, Huantajayite.*
167. Sylvite. Isometric; potassium chloride, KCl.
168. Sal-ammoniac. Isometric; ammonium chloride, NH_4Cl.
169. Cerargyrite. Isometric; silver chloride, AgCl.
RELATED:—*Bordosite.*
170. Embolite. Isometric; silver chlorobromide, Ag(Cl,Br).
171. Bromyrite. Isometric; silver bromide, AgBr.
172. Iodobromite. Isometric; silver chloroiodobromide, 2AgCl.2AgBr.AgI.
173. Iodyrite. Hexagonal; silver iodide, AgI.
RELATED:—*Tocornalite, Zimapanite, Zinc Iodide, Coccinite, Bustamentite, Zinc Bromide.*

FLUORITE GROUP.—$\overset{II}{R}(Cl,F)_2$. Isometric.

174. Hydrophilite. Isometric; calcium chloride, $CaCl_2$.

175. Fluorite. Isometric; calcium fluoride, CaF_2.

VARIETIES :—

1. *Ordinary* :—
   (a) *cleavable to crystallized in many colors,*
   (b) *fibrous,*
   (c) *granular,*
   (d) *earthy.*
2. *Antozonite.*

ALTERS TO :—Quartz, Hematite, Psilomelane, Smithsonite, Kaolinite, Limonite, Lithomarge, Calamine, Cerussite, Calcite.

RELATED :—*Bruiachite, Gunnisonite.*

176. Chloromagnesite. A deliquescent mass; magnesium chloride, $MgCl_2$.

177. Sellaite. Tetragonal; magnesium fluoride, MgF_2.

178. Lawrencite. A deliquescent mass; ferrous chloride, $FeCl_2$.

179. Scacchite. A deliquescent mass; manganese protochloride, $MnCl_2$.

RELATED :—*Chloralluminite.*

180. Cotunnite. Orthorhombic; lead chloride, $PbCl_2$.

RELATED :—*Pseudocotunnite.*

181. Molysite. Incrusting; ferric chloride, $FeCl_3$.

182. Tysonite. Hexagonal; fluoride of cerium metals. $(Ce,La,Di)F_3$.

ALTERS TO :—Bastnäsite.

183. Cryolite. Monoclinic; sodium and aluminium fluoride, Na_3AlF_6.

RELATED :—*Elpasolite.*

184. Chiolite. Tetragonal; aluminium and sodium fluoride, $5NaF.3AlF_3$.

RELATED :—*Chodneffite.*

185. Hieratite. Isometric; potassium and silicon fluoride, $2KF.SiF_4$.

RELATED :—*Hydrofluorite, Cryptohalite, Proidonite.*

II. OXYCHLORIDES, OXYFLUORIDES.

A. OXYCHLORIDES.

186. Matlockite. Tetragonal; lead oxychloride. $PbCl_2.PbO$.

187. Mendipite. Orthorhombic; lead oxychloride, $PbCl_2.2PbO$.

188. Schwartzembergite. Rhombohedral; lead oxychloroiodide, $Pb(I,Cl)_2,2PbO(?)$.

189. Laurionite. Orthorhombic; basic lead chloride, $PbCl_2.Pb(OH)$.

190. Daviesite. Orthorhombic; lead oxychloride.

191. Fiedlerite. Monoclinic; lead oxychloride.

192. Percylite. Isometric; hydrated lead and copper oxychloride, $PbCuO_2H_2Cl_2(?)$.

193. Atacamite. Orthorhombic; hydrous copper oxychloride, $CuCl_2.3Cu(OH)_2$.

ALTERS TO :—Malachite, Chrysocolla.

RELATED :—*Tallingite, Erythrocalcite, Melanothallite, Atelite.*

194. Daubréeite. Amorphous; a hydrated bismuth oxychloride, $2Bi_2O_3.BiCl_3 3H_2O(?)$.

B. OXYFLUORIDES.

195. Nocerite. Hexagonal; a calcium and magnesium oxyfluoride, $2(Ca,Mg)F_2.(Ca,Mg)O(?)$.

RELATED:—*Fluosiderite, Pseudonocerina.*

196. Fluocerite. Massive; oxyfluoride of cerium and yttrium metals, $(Ce,La,Di,Y,Er,Yt)_2OF_4$.

A. HYDROUS CHLORIDES.

197. Bischofite. Granular; hydrous magnesium chloride, $MgCl_2 + 6H_2O$.

198. Kremersite. Isometric; hydrous potassium, ammonium and iron chloride, $KCl.NH_4Cl.FeCl_3 + H_2O$.

199. Erythrosiderite. Orthorhombic; hydrous potassium and iron chloride, $2KCl.FeCl_3.H_2O$.

200. Douglasite. Hydrous potassium and iron chloride, $2KCl.FeCl_2.2H_2O(?)$.

201. Carnallite. Orthorhombic; hydrous potassium and magnesium chloride, $KCl.MgCl_2 + 6H_2O$.

202. Tachhydrite. Rhombohedral; hydrous calcium and magnesium chloride, $CaCl_2.2MgCl_2 + 12H_2O$.

203. Fluellite. Orthorhombic; a hydrous aluminium fluoride. $AlF_3 + H_2O$.

204. Prosopite. Monoc.; a hydrous alum. and calcium fluoride, $CaF_2.2Al(F,OH)_3$.

205. Pachnolite. Monoclinic; a hydrous aluminium, calcium and sodium fluoride, $NaF.CaF_2.AlF_3.H_2O$.

206. Thomsenolite. Monoclinic; hydrous aluminium, calcium and sodium fluoride, $NaF.CaF_2.AlF_3.H_2O$.

RELATED :—*Hagemannite.*

207. Gearksutite. Masses of minute needles; perhaps a hydrous calcium and aluminium fluoride, $CaF_2.Al(F,OH)_3H_2O$.

208. Ralstonite. Isometric; a hydrous sodium and aluminium fluoride, $(Na_2,Mg)F_2.3Al(F,OH)_3.2H_2O$.

209. Yttrocerite. Massive; a calcium fluoride with the cerium and yttrium metals, $2(2[Ce,La,Di,Y,Er]F_3.9CaF_2. + 3H_2O$.

V. OXIDES.

I. OXIDES OF SILICON.

210. Quartz. Rhombohedral; silicon dioxide, SiO_2.

A. PHENOCRYSTALLINE OR VITREOUS VARIETIES :—

1. *Rock Crystal* :—
   (a) *Cavernous,*
   (b) *Capped,*
   (c) *Drusy,*
   (d) *Radiated,*
   (e) *Fibrous.*
2. *Star-quartz (asteriated),*
3. *Amethyst,*
4. *Rose-quartz,*
5. *Citrine (yellow),*
6. *Smoky-quartz,*
7. *Milky-quartz,*
8. *Sapphire-quartz,*
9. *Aventurine,*
10. *Containing liquids with moving bubble,*
11. *Sagenitic, containing:*—
    (a) *Rutile,*
    (b) *Black Tourmaline,*
    (c) *Göthite,*
    (d) *Stibnite,*
    (e) *Asbestus,*
    (f) *Actinolite,*
    (g) *Hornblende,*
    (h) *Epidote.*
12. *Cat's-Eye,*
13. *Tiger-Eye,*
14. *Impure from Minerals* :—
    (a) *Ferruginous,*
    (b) *Chloritic,*
    (c) *Actinolitic,*
    (d) *Micaceous,*
    (e) *Arenaceous.*

B. CRYPTOCRYSTALLINE VARIETIES :—

1. *Chalcedony,*
2. *Carnelian,*
3. *Chrysoprase,*
4. *Prase,*
5. *Plasma,*
6. *Blood-stone (Heliotrope),*
7. *Agate* :—
   (a) *Banded,*
   (b) *Fortification,*
   (c) *Moss.*
8. *Onyx,*
9. *Sardonyx,*
10. *Agate—Jasper,*
11. *Siliceous Sinter,*
12. *Flint,*
13. *Hornstone (Chert),*
14. *Touchstone,*
15. *Jasper* :—
    (a) *Red,*
    (b) *Brownish,*
    (c) *Dark green,*
    (d) *Grayish blue,*
    (e) *Blackish,*
    (f) *Riband Jasper,*
    (g) *Egyptian Jasper*
    (h) *Jasponyx,*
    (i) *Jasperized wood*

OTHER VARIETIES :—

1. *Granular-quartz,*
2. *Quartzose Sandstone,*
3. *Quartz Conglomerate,*
4. *Flexible Sandstone,*
5. *Buhrstone,*
6. *Cotterite.*
7. *Pseudomorphous Quartz* :—
   (a) *Tabular-quartz,*
   (b) *Haytorite,*
   (c) *Babel-quartz,*
   (d) *Silicified shells*
   (e) *Silicified wood*
   (f) *Beekite.*

ALTERS TO :—Pyrite, Magnetite, Voltzite, Cassiterite, Hematite.

211. Tridymite. Hexagonal (?); pure silica, SiO_2.

RELATED :—

Asmanite,
Cristobalite,
Granuline,
Melanophlogite,
Sulfuricin,
Vestan,
Jenzschite,
Passyite.

212. Opal. Amorphous; silica, with varying amount of water, $SiO_2.nH_2O$.

VARIETIES:—

1. *Precious Opal,*
2. *Fire-opal,*
3. *Girasol,*
4. *Common Opal:*—
   (a) *Milk-opal,*
   (b) *Resin-opal,*
   (c) *Green,*
   (d) *Brick-red,*
   (e) *Hydrophane,*
   (f) *Forcherite.*
5. *Cacholong,*
6. *Opal-agate,*
7. *Menilite,*
8. *Jasp-opal,*
9. *Wood-opal,*
10. *Hyalite,*
11. *Fiorite:*—
    (a) *Pearl-sinter,*
    (b) *Michaelite,*
    (c) *Geyserite.*
12. *Float-stone,*
13. *Tripolite:*—
    (a) *Infusorial Earth,*
    (b) *Randannite,*
    (c) *Tripoli Slate,*
    (d) *Alumocalcite.*

RELATED:—*Lussatite, Tabasheer.*

II. OXIDES OF THE SEMI-METALS; also MO and W.

1. ARSENOLITE GROUP. R_2O_3. Isometric.

213. Arsenolite. Isometric; arsenic trioxide, As_2O_3.
214. Senarmontite. Isometric; antimony trioxide, Sb_2O_3.
ALTERS TO:—Stibnite.

2. VALENTINITE GROUP. R_2O_3.

215. Claudetite. Monoclinic; arsenic trioxide. As_2O_3.
216. Valentinite. Orthorhombic; antimony trioxide, Sb_2O_3.
217. Bismite. Orthorhombic; bismuth trioxide, Bi_2O_3.
RELATED:—*Karelinite, Tantalic Ocher, Vanadic Ocher.*

3. TELLURITE GROUP. RO_2. Orthorhombic.

218. Tellurite. Orthorhombic; tellurium dioxide, TeO_2.
RELATED:—*Selenolite.*

4. MOLYBDITE GROUP.

219. Molybdite. Orthorhombic; molybdenum trioxide, MoO_3.
RELATED:—*Ilsemannite.*
220. Tungstite. Orthorhombic; tungsten trioxide, WO_3.
RELATED:—*Meymacite.*
221. Cervantite. Orthorhombic; antimony dioxide, $Sb_2O_3.Sb_2O_5$.
222. Stibiconite. Massive; a hydrous antimony dioxide, $Sb_2O_4.H_2O(?)$.
RELATED:—*Volgerite, Stibianite, Partzite, Rivotite, Stibioferrite, Stetefeldtite.*

III. OXIDES OF THE METALS.

A. ANHYDROUS OXIDES.

I. PROTOXIDES. R_2O and RO.

223. Water. Hydrogen oxide, H_2O.

STATES OF EXISTENCE:—
1. *Solid, Ice (hexagonal)*; 2. *Liquid, Water;* 3. *Gas, Steam and Aqueous Vapor*

224. Cuprite. Isometric; cuprous oxide, Cu_2O.

VARIETIES:—

1. *Ordinary:*—
   (a) *crystallized,*
   (b) *massive,*
2. *Chalcotrichite,*
3. *Tile Ore.*

ALTERS TO:—Native copper, Malachite, Azurite, Chrysocolla, Melaconite, Limonite.
RELATED —*Hydrocuprite.*

PERICLASE GROUP. RO. Isometric.

225. Periclase. Isometric; magnesium oxide, MgO.
226. Manganosite. Isometric; manganese protoxide, MnO.
227. Bunsenite. Isometric; nickel protoxide, NiO.
228. Zincite. Hexagonal; zinc oxide, ZnO.
RELATED :—*Calcozincite.*
229. Massicot. Massive; lead monoxide, PbO.
230. Tenorite. Monoclinic; cupric oxide, CuO.
VARIETIES :—1. *Ordinary*, 2. *Melaconite.*
RELATED :—*Marcylite, Lime, Palladinite.*

II. SESQUIOXIDES. R_2O_3.

HEMATITE GROUP. Rhombohedral.

231. Corundum. Rhombohedral; alumina, Al_2O_3.
VARIETIES :—1. *Sapphire*, 2. *Ruby*, 3. *Corundum*, 4. *Emery.*
232. Hematite. Rhombohedral; iron sesquioxide, Fe_2O_3.

VARIETIES :—

1. *Specular* :—
   (a) *Crystallized*,
   (b) *Micaceous*,
   (c) *Massive.*
2. *Compact Columnar*,
3. *Red Ocherous*,
4. *Clay Iron-stone.*

ALTERS TO :—Magnetite, Siderite, Pyrite, Limonite.
RELATED :—*Martite, Raphisiderite.*
233. Ilmenite. Rhombohedral; an iron and titanium oxide, generally $FeTiO_3$.

VARIETIES :—

1. *Kibdelophane*,
2. *Crichtonite*,
3. *Ilmenite*,
4. *Menaccanite*,
5. *Hystatite*,
6. *Washingtonite*,
7. *Uddevallite*,
8. *Eisenrosen*,
9. *Kragerö hematite*,
10. *Magnesian*,
11. *Paracolumbite.*

RELATED :—*Hydroilmenite, Ferrozincite, Iserine.*

III. INTERMEDIATE OXIDES.

SPINEL GROUP. $\overset{II}{RO}.\overset{III}{R_2O_3}$. Isometric.

234. Spinel. Isometric; magnesium aluminate, $MgO.Al_2O_3$.

VARIETIES :—

1. *Ordinary*, 2. *Ruby Spinel*, 3. *Ceylonite*, 4. *Chlorospinel*, 5. *Picotite.*
ALTERS TO :—Steatite, Serpentine, Hydrotalcite, Mica.
235. Hercynite. Isometric; iron aluminate, $FeAl_2O_4$.
236. Gahnite. Isometric; zinc aluminate, $ZnAl_2O_4$.
VARIETIES :—1. *Automolite*, 2. *Dysluite*, 3. *Kreittonnite.*
237. Magnetite. Isometric; iron sesquioxide and iron protoxide, $FeO.Fe_2O_3$.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystals*,
   (b) *Massive*,
   (c) *Loose sand*,
   (d) *Lodestone.*
2. *Magnesian*,
3. *Niccoliferous*,
4. *Titaniferous*,
5. *Manganmagnetite*,
6. *Ocherous.*

RELATED :—*Nickel Oxide.*
238. Magnesioferrite. Isometric; magnesium ferrate, $MgO.Fe_2O_3$.
239. Franklinite. Isometric; an iron, zinc and manganese ferrate and manganate, $(Fe,Zn,Mn)O.(Fe,Mn)_2O_3$.
240. Jacobsite. Isometric; a manganese and magnesium ferrate and manganate, $(Mn,Mg.)O.(Fe,Mn)_2O_3$.
241. Chromite. Isometric; iron chromate, $FeO.Cr_2O_3$.
VARIETIES :—1. *Crystals*, 2. *Massive*, 3. *Chrompicotite*, 4. *Magnochromite.*
RELATED :—*Irite, Plumboferrite.*

242. Chrysoberyl. Orthorhombic; beryllium aluminate, $BeO.Al_2O_3$.
VARIETIES:—1. *Pale Green*, 2. *Alexandrite*, 3. *Cat's Eye.*
243. Hausmannite. Tetragonal; manganese sesquioxide and protoxide, $MnO.Mn_2O_3$.
244. Minium. Pulverulent; lead plumbate, $2PbO.PbO_2$.
245. Crednerite. Monoclinic; copper manganate, $3CuO.2Mn_2O_3$.
246. Pseudobrookite. Orthorhombic; an iron titanate, $2Fe_2O_3.3TiO_2$ (?).
247. Braunite. Tetragonal; manganese silico-manganate, $3Mn_2O_3.MnSiO_3$.

IV. DIOXIDES. RO_2.

RUTILE GROUP. Tetragonal.

248. Cassiterite. Tetragonal; tin dioxide, $Sn\,O_2$.
VARIETIES:—
1. *Crystallized*, 2. *Massive*, 3. *Wood Tin* ("Toad's-eye"), 4. *Stream Tin.*
RELATED:—*Stannite, Ainalite.*
249. Polianite. Tetragonal; manganese dioxide, MnO_2.
250. Rutile. Tetragonal; titanium dioxide, TiO_2.
VARIETIES:—
1. *Ordinary:*— (a) *Red Crystals*, (b) *Rutilated Quartz.* 2. *Ferriferous:*— (a) *Nigrine*, (b) *Ilmenorutile*, 3. *Chromiferous.*
RELATED:—*Iserite.*
251. Plattnerite. Tetragonal; lead dioxide, PbO_2.
252. Octahedrite. Tetragonal; titanium dioxide, TiO_2.
253. Brookite. Orthorhombic; titanium dioxide, TiO_2.
VARIETIES:—1. *Ordinary, Tabular*, 2. *Arkansite.*
ALTERS TO:—Rutile.
RELATED:—*Eumanite.*
254. Pyrolusite. Orthorhombic; manganese dioxide, MnO_2.

B. HYDROUS OXIDES.

255. Turgite. Fibrous; hydrous iron sesquioxide, $2Fe_2O_3.H_2O$.

DIASPORE GROUP. $R_2O_3.H_2O$.

256. Diaspore. Orthorhombic; hydrous aluminium sesquioxide, $Al_2O_3.H_2O$.
257. Göthite. Orthorhombic; hydrous iron sesquioxide, $Fe_2O_3.H_2O$.
VARIETIES:—
1. *Thin tabular*, 2. *Capillary*, 3. *Columnar or fibrous*, 4. *Scaly-fibrous*, 5. *Compact massive*, 6. *Disseminated crystals.*
258. Manganite. Orthorhombic; hydrous manganese sesquioxide, $Mn_2O_3.H_2O$.
ALTERS TO:—Pyrolusite, Hausmannite, Braunite.
259. Limonite. Massive; hydrous iron sesquioxide, $2Fe_2O_3.3H_2O$.
VARIETIES:—1. *Compact*, 2. *Ocherous*, 3. *Bog Ore*, 4. *Brown Clay-ironstone.*
ALTERS TO:—Siderite, Hematite.
260. Xanthosiderite. Acicular; hydrous iron sesquioxide, $Fe_2O_3.2H_2O$.
RELATED:—*Limnite.*
261. Bauxite. Massive; a hydrous aluminium sesquioxide, $Al_2O_3.2H_2O$.
VARIETIES:—1. *Oolitic*, 2. *Clay-like.*

BRUCITE GROUP.—$R(OH)_2$. Rhombohedral.

262. Brucite. Rhombohedral; magnesium hydrate, $MgO.H_2O$.
VARIETIES:—1. *Ordinary*, 2. *Nemalite*, 3. *Manganbrucite.*
ALTERS TO:—Hydromagnesite, Serpentine.
RELATED:—*Eisenbrucite.*
263. Pyrochroite. Rhombohedral; manganese hydrate, $Mn.O.H_2O$.
264. Gibbsite. Monoclinic; aluminium hydrate, $Al_2O_3.3H_2O$.
RELATED:—*Richmondite, Zirlite.*
265. Sassolite. Triclinic; boric acid, $B_2O_3.3H_2O$.
266. Hydrotalcite. Hexagonal; a hydrous aluminium and magnesium oxide, $Al_2O_3.6MgO.15H_2O$(?).
RELATED:—*Houghite.*

267. Pyroaurite. Hexagonal; a hydrous magnesium and iron oxide, $Fe_2O_3.6MgO.15H_2O(?)$.

268. Chalcophanite. Rhombohedral; a hydrated manganese and zinc protoxide and manganese dioxide, $(MnZn)O.2MnO_2.2H_2O$.

269. Psilomelane. Massive; a hydrous manganese manganate, $H_4MnO_5(?)$.

RELATED :—

1. *Wad* :—
   (a) *Bog Manganese,*
   (b) *Asbolite,*
   (c) *Lampadite.*
2. *Lithiophorite,*
3. *Varvicite.*

APPENDIX TO OXIDES.

Bernonite,
Delafossite,
Hetaerolite,
Heterogenite,
Heubachite,
Hydrated Titanic Oxide,
Hydrofranklinite,
Hydroplumbite,
Namaqualite,
Pelagite,
Rabdionite,
Transvaalite,
Winklerite.

VI. OXYGEN-SALTS.

1. Carbonates.

A. ANHYDROUS CARBONATES.

1. CALCITE GROUP. RCO_3. Rhombohedral.

270. Calcite. Rhombohedral; calcium carbonate, $CaCO_3$.

A. VARIETIES BASED ON CRYSTALLIZATION AND IMPURITIES.

I. *Ordinary* :—
   (a) *Dog-tooth Spar,*
   (b) *Nail-head Spar,*
   (c) *Iceland Spar,*
   (d) *Brunnerite,*
   (e) *Reichite,*
   (f) *Fontainebleau limestone,*
   (g) *Hislopite.*

II. *Fibrous and lamellar*:—
   (a) *Satin Spar,*
   (b) *Argentine,*
   (c) *Aphrite.*

III. *Granular massive to cryptocrystalline.*

1. *Granular limestone* :—
   (a) *Statuary marble,*
   (b) *Cipolin,*
   (c) *Giallo antico,*
   (d) *Siena,*
   (e) *Mandelato,*
   (f) *Bardiglio,*
   (g) *Turquoise-blue,*
   (h) *Verd-Antique.*

2. *Hard compact limestone (marbles)* :—
   (a) *Black,*
   (b) *Yellow,*
   (c) *Red,*
   (d) *Fetid,*
   (e) *Panno-di-Morte,*
   (f) *Marble of Languedoc,*
   (g) *Griotte,*
   (h) *Sarencolin,*
   (i) *Bird's-eye,*
   (k) *Shell-marble,*
   (l) *Madreporic marble,*
   (m) *Encrinal,*
   (n) *Lumachelle,*
   (o) *Ruin-marble,*
   (p) *Lithographic stone,*
   (q) *Breccia marble,*
   (r) *Pudding stone,*
   (s) *Hydraulic lime stone.*

3. *Soft compact limestone* :—
   (a) *Chalk,*
   (b) *Calcareous marl.*

4. *Concretionary massive*:—
   (a) *Oolite,*
   (b) *Pisolite.*

5. *Deposited by calcareous waters* :—
   (a) *Stalactites,*
   (b) *Stalagmite,*
   (c) *Mexican onyx,*
   (d) *Travertine,*
   (e) *Calc Tufa,*
   (f) *Agaric mineral,*
   (g) *Rock-meal.*

B. VARIETIES BASED UPON COMPOSITION :—

1. *Dolomitic calcite,*
2. *Baricalcite,*
3. *Strontianocalcite,*
4. *Ferrocalcite,*
5. *Manganocalcite,*
6. *Zincocalcite,*
7. *Plumbocalcite.*

ALTERS TO :—Dolomite, Calamine, Siderite, Malachite, Azurite, Gypsum, Smithsonite, Barite, Fluorite, Limonite, Göthite, Hematite, Minium, Meerschaum, Chlorite, Quartz, Chalcedony, Garnet, Feldspar, Mica, Pyrolusite, Hausmannite, Manganite, Marcasite, Galena, Sphalerite. Native copper.

RELATED :—*Thinolite, Predazzite Pencatite.*

271. Dolomite. Rhombohedral; calcium and magnesium carbonate, $CaCO_3.MgCO_3$.

STRUCTURAL VARIETIES :—

(a) *Crystallized* (*Pearl Spar*),
(b) *Columnar*,
(c) *Granular*,
(d) *Compact massive*,
(e) *Compact porcellanous*.

VARIETIES DEPENDING ON COMPOSITION :—

1. *Normal Dolomite*,
2. *Brown Spar*,
3. *Manganiferous*,
4. *Cobaltiferous*,
5. *Zinciferous*.

ALTERS TO :—Siderite, Calamine, Steatite, Limonite, Hematite, Göthite, Pyrolusite, Quartz.

271A. Ankerite. Rhombohedral; calcium, magnesium, iron and manganese carbonates, $CaCO_3(Mg,Fe,Mn)CO_3$.

272. Magnesite. Rhombohedral; magnesium carbonate, $MgCO_3$.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystallized*,
   (b) *Lamellar*,
   (c) *Fine granular*,
   (d) *Compact*,
   (e) *Earthy*.
2. *Ferriferous* (*Breunnerite*).

272A. Mesitite. Rhombohedral; magnesium and iron carbonate, $2MgCO_3.FeCO_3$.

VARIETIES :—1. *Mesitite*, 2. *Pistomesite*.

273. Siderite. Rhombohedral; iron protocarbonate, $FeCO_3$.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystallized*,
   (b) *Concretionary* (*Sphærosiderite*),
   (c) *Granular to compact*,
   (d) *Oolitic*,
   (e) *Earthy*.
2. *Manganiferous* (*oligonite*),
3. *Magnesian* (*sideroplesite*),
4. *Calciferous* (*siderodot*).

ALTERS TO :—Limonite, Hematite, Magnetite, Quartz.

RELATED :—*Thomäite* (*?*).

274. Rhodochrosite. Rhombohedral; manganese protocarbonate, $MnCO_3$.

VARIETIES :—

1. *Ordinary*,
2. *Ferriferous*,
3. *Calciferous* (*Manganocalcite*),
4. *Zinciferous*.

ALTERS TO :—Quartz.

275. Smithsonite. Rhombohedral; zinc carbonate, $ZnCO_3$.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystallized*,
   (b) *Botryoidal*,
   (c) *Granular to compact*,
   (d) *Earthy*,
2. *Ferriferous*,
3. *Manganiferous*,
4. *Cupriferous* (*Herrerite*).

ALTERS TO :—Calamine, Quartz, Limonite, Göthite.

RELATED :—*Orthorhombic zinc carbonate* (*?*).

276. Sphærocobaltite. Rhombohedral; cobalt protocarbonate, $CoCO_3$.

2. ARAGONITE GROUP. RCO_3. Orthorhombic.

277. Aragonite. Orthorhombic; calcium carbonate, $CaCO_3$.

VARIETIES :—

1. *Ordinary* :—
   (a) *Crystallized*,
   (b) *Columnar*,
   (c) *Massive*.
2. *Mossottite*,
3. *Scaly massive*,
4. *Stalactitic*,
5. *Coralloidal*,
6. *Tarnowitzite*.

ALTERS TO :—Copper, Calcite.

278. Bromlite. Orthorhombic; barium and calcium carbonate, $BaCO_3.CaCO_3$.

279. Witherite. Orthorhombic; barium carbonate, $BaCO_3$.

ALTERS TO:—Barite.

280. Strontianite. Orthorhombic; strontium carbonate, $SrCO_3$.

ALTERS TO :—Celestite.

281. Cerussite. Orthorhombic; lead carbonate, $PbCO_3$.

ALTERS TO :—Pyromorphite, Minium, Galena.

3. BARYTOCALCITE GROUP. Monoclinic.

282. Barytocalcite. Monoclinic; barium and calcium carbonate, $BaCO_3.CaCO_3$.

283. Bismutospharite. Spherical; bismuth carbonate, Bi_2CO_5.

4. PARISITE GROUP. Hexagonal.

284. Parisite. Hexagonal; a fluocarbonate of the cerium metals, $(CaF)(CeF)Ce(CO_3)_3(?)$

RELATED :—*Kischtimite.*

285. Bastnäsite. Massive; a fluocarbonate of the cerium metals, $(Ce,La,Di)_2C_3O_9.(Ce,La,Di)F_3$.

RELATED :—*Weibyeïte.*

5. PHOSGENITE GROUP. Chlorocarbonate. Tetragonal.

286. Phosgenite. Tetragonal; lead chlorocarbonate, $PbCO_3.PbCl_2$.

ALTERS TO :—Lead carbonate.

B. ACID, BASIC AND HYDROUS CARBONATES.

287. Teschemacherite. Orthorhombic; acid ammonium carbonate, $(NH_4)_2CO_3.H_2CO_3$.

RELATED :—*Kalicine.*

288. Malachite. Monoclinic; basic cupric carbonate, $2CuO.CO_2.H_2O$.

RELATED :—*Lime-malachite, Mysorin.*

289. Azurite. Monoclinic; basic cupric carbonate, $3CuO.CO_2.H_2O$.

ALTERS TO :—Malachite, Native copper.

RELATED :—*Atlasite, Zinkazurite.*

290. Aurichalcite. Monoclinic (?); basic zinc and copper carbonate, $2(Zn,Cu)CO_3.3(ZnCu)(OH)_2$.

291. Hydrozincite. Massive; a basic zinc carbonate, $3ZnO.CO_2.2H_2O(?)$.

292. Hydrocerussite. Hexagonal; a basic lead carbonate, $3PbO.2CO_2.H_2O(?)$.

293. Dawsonite. Monoclinic (?); basic aluminium and sodium carbonate, $Na_2O.Al_2O_3.2CO_2.2H_2O$.

RELATED :—*Hovite.*

294. Thermonatrite. Orthorhombic; hydrous sodium carbonate, $Na_2CO_3+H_2O$.

295. Nesquehonite. Orthorhombic; hydrous magnesium carbonate, $MgCO_3+3H_2O$.

296. Natron. Monoclinic; hydrous sodium carbonate, $Na_2CO_3+10H_2O$.

297. Gay-lussite. Monoclinic; hydrous calcium and sodium carbonate, $CaCO_3.Na_2CO_3+5H_2O$.

298. Lanthanite. Orthorhombic; hydrous lanthanum carbonate, $La_2(CO_3)_3+9H_2O$.

RELATED :—*Hydroconite.*

299. Trona. Monoclinic; hydrous sodium carbonate and bicarbonate, $Na_2CO_3.HNaCO_3+2H_2O$.

300. Hydromagnesite. Monoclinic (?); basic magnesium carbonate, $3MgCO_3.Mg(OH)_2+3H_2O$.

301. Hydrogiobertite. Spherical; hydrous basic magnesium carbonate, $MgCO_3.Mg(OH)_2+2H_2O$.

302. Lansfordite. Triclinic; hydrous basic magnesium carbonate, $3MgCO_3.Mg(OH)_2+21H_2O$.

RELATED :—*Hydrodolomite, Hibbertite.*

303. Zaratite. Massive; hydrous basic nickel carbonate, $3NiO.CO_2.6H_2O$.

304. Remingtonite. Incrusting; a hydrous cobalt carbonate.

305. Tengerite. Pulverulent; an yttrium carbonate (?).

306. Bismutite. Incrusting; a basic bismuth carbonate, $Bi_2O_3.CO_2.H_2O(?)$.

RELATED :—*Waltherite, Agnesite.*

307. Uranothallite. Orthorhombic; hydrous uranium and calcium carbonate, $2CaCO_3.U(CO_3)_2 10H_2O$.

308. Liebigite. Coatings; a hydrous uranium and calcium carbonate, $CaCO_3.(UO_2)CO_3.20H_2O$.

309. Voglite. Scales; a hydrous uranium, calcium and copper carbonate.

RELATED :—*Schröckingerite, Selbite, Randite.*

2. Silicates.

A. ANHYDROUS SILICATES.

I. DISILICATES, RSi_2O_5. POLYSILICATES, $R_2Si_3O_8$.

PETALITE GROUP.

310. Petalite. Monoclinic; lithium and aluminium disilicate, $Li_2O.Al_2O_3.8SiO_2$.
VARIETIES:—1. *Ordinary*, 2. *Castorite.*
RELATED:—*Hydrocastorite.*

311. Milarite. Hexagonal; aluminium, calcium and potassium disilicate, $H_2O.K_2O.4CaO.2Al_2O_3.24SiO_2$.

312. Eudidymite. Monoclinic; sodium and beryllium polysilicate, $H_2O.Na_2O.2BeO.6SiO_2$.

FELDSPAR GROUP.

A. MONOCLINIC SECTION.

313. Orthoclase. Monoclinic; aluminium and potassium polysilicate, $K_2O.Al_2O_3.6SiO_2$.

VARIETIES:—

1. *Adularia*,
2. *Sanidine*,
3. *Ordinary Crystals*,
4. *Cleavable*,
5. *Compact*,
6. *Leelite*,
7. *Loxoclase*,
8. *Paradoxite*,
9. *Necronite*,
10. *Lazurfeldspar*,
11. *Murchisonite*,
12. *Weissigite.*

ALTERS TO:—Steatite, Talc, Chlorite, Kaolin, Lithomarge, Mica, Laumontite, Cassiterite, Calcite.
RELATED:—*Perthite, Krablite.*

314. Hyalophane. Monoclinic; an aluminium, barium and potassium silicate, $K_2O.BaO.2Al_2O_3.8SiO_2$.

B. TRICLINIC SECTION.

315. Microcline. Triclinic; aluminium and potassium polysilicate, $K_2O.Al_2O_3.6SiO_2$.
VARIETIES:—1. *Ordinary*, 2. *Moonstone*, 3. *Amazon stone*, 4. *Chesterlite.*

315A. Anorthoclase. Triclinic; essentially a sodium and potassium polysilicate, $(NaK)Al_2Si_3O_8$.

ALBITE—ANORTHITE SERIES.

316. Albite. Triclinic; aluminium and sodium polysilicate, $Na_2O.Al_2O_3.6SiO_2$.

VARIETIES:—

1. *Crystals*,
2. *Cleavable*,
3. *Massive*,
4. *Peristerite*,
5. *Aventurine Feldspar*,
6. *Moonstone*,
7. *Pericline*,
8. *Hyposclerite*,
9. *Cleavelandite*,
10. *Olafite*,
11. *Zygadite*,
12. *Tschermakite.*

NOTE.—Between the isomorphous species Albite (Ab) and Anorthite (An), are several subspecies, regarded as isomorphous mixtures of these molecules, and defined according to the ratio in which they enter.

317. Oligoclase. Triclinic; aluminium, sodium and calcium polysilicate (intermediate between albite and anorthite, Ab_3An_1).
VARIETIES:—1. *Crystals*, 2. *Massive*, 3. *Aventurine Feldspar.*

318. Andesine. Triclinic; aluminium, sodium and calcium polysilicate (intermediate between albite and anorthite, Ab_3An_2 to Ab_1An_1).

319. Labradorite. Triclinic; aluminium, sodium and calcium polysilicate (intermediate between albite and anorthite, Ab_1An_1 to Ab_1An_3).

VARIETIES:—

1. *Cleavable*:—
   (a) *Well crystallized*,
   (b) *Massive*,
2. *Compact massive* (*Labradorite—Felsite*).

ALTERS TO:—The Zeolites, etc.
RELATED:—*Maskelynite.*

320. Anorthite. Triclinic; aluminium and calcium poly-silicate, $CaO.Al_2O_3.2SiO_2$.

VARIETIES:—

1. *Anorthite,*
2. *Christianite,*
3. *Biotine,*
4. *Crystals,*
5. *Indianite (granular),*
6. *Lepolite,*
7. *Lindsayite,*
8. *Latrobite,*
9. *Tankite (cleavable).*

RELATED:—*Barsowite, Huronite, Mikrotin, Sigterite.*

II. METASILICATES. $RSiO_3$.

1. LEUCITE GROUP. Isometric.

321. Leucite. Isometric; aluminium and potassium metasilicate, $K_2O.Al_2O_3.4SiO_2$.
ALTERS TO:—Feldspar, Nephelite, Kaolin, Analcite.

322. Pollucite. Isometric; hydrous cæsium, sodium and aluminium metasilicate, $H_2O.(Cs,Na)_2O.Al_2O_3.5SiO_2$.

2. PYROXENE GROUP.

a. ORTHORHOMBIC SECTION.

323. Enstatite. Orthorhombic; magnesium metasilicate, $MgO.SiO_2$.

VARIETIES:—

1. *Ordinary (light color,)*
2. *Chladnite,*
3. *Victorite,*
4. *Bronzite (ferriferous).*

ALTERS TO:—Talc, Serpentine.

324. Hypersthene. Orthorhombic; magnesium and iron metasilicate, $(Fe,Mg)O.SiO_2$.
VARIETIES:—1. *Lamellar,* 2. *Amblystegite,* 3. *Szaboite.*
RELATED:—*Diaclasite, Bastite, Phästine, Peckhamite.*

β. MONOCLINIC SECTION.

325. Pyroxene. Monoclinic; a normal metasilicate, mainly $CaO.(Fe,Mg)O._2SiO_2$.

I. VARIETIES CONTAINING LITTLE OR NO ALUMINIUM:—

1. *Diopside,*
2. *Chrome-diopside,*
3. *Malacolite,*
4. *Alalite,*
5. *Mussite,*
6. *Traversellite,*
7. *Canaanite,*
8. *Lavrovite,*
9. *Hedenbergite,*
10. *Salite,*
11. *Baikalite,*
12. *Protheite,*
13. *Funkite,*
14. *Lotalite,*
15. *Violan,*
16. *Anthochroite,*
17. *Asteroite,*
18. *Coccolite,*
19. *Manganhedenbergite,*
20. *Diallage,*
21. *Hudsonite,*
22. *Omphacite,*
23. *Schefferite,*
24. *Jeffersonite.*

II. ALUMINOUS VARIETIES:—

1. *Augite,*
2. *Leucaugite,*
3. *Fassaite,*
4. *Titaniferous augite,*
5. *Alkali-augite.*

ALTERS TO:—Talc, Serpentine, Epidote, Mica.
RELATED (mostly alteration products of Pyroxene):—
Hectorite, Monradite, Picrophyll, Pitkärantite, Hydrous diallage, Pyrallolite, Strakonitzite, Uralite.

326. Acmite (Aegirite). Monoc.; iron and sodium metasilicate, $Na_2O.Fe_2O_3.4SiO_2$.
ALTERS TO:—Analcite.

327. Spodumene. Monoc.; aluminium and lithium metasilicate, $Li_2O.Al_2O_3.4SiO_2$.
VARIETIES:—1. *Ordinary white,* 2. *Hiddenite.*
ALTERS TO:—*β* Spodumene, Cymatolite, Killinite.

328. Jadeite. Monoclinic; sodium and aluminium metasilicate, $Na_2O.Al_2O_3.4SiO_2$.
VARIETIES:—1. *Ordinary,* 2. *Chloromelanite.*
(Jade is a term applied to Jadeite, Nephrite and other species.)

329. Wollastonite. Monoclinic; calcium metasilicate, $CaO.SiO_2$.
VARIETIES:—1. *Ordinary,* 2. *Edelforsite.*

330. Pectolite. Monoclinic; a sodium and calcium metasilicate, $H_2O.Na_2O.4CaO.6SiO_2$.

VARIETIES :—1. *Osmelite*, 2. *Walkerite*, 3. *Compact*, 4. *Manganpectolite.*

331. Rosenbuschite. Monoclinic; calcium and sodium metasilicate, with some zirconium, titanium and fluorine, $6CaSiO_3.2Na_2ZrO_2F_2.(TiSiO_3TiO_3)$.

332. Låvenite. Monoclinic; a manganese, iron, calcium and sodium metasilicate, with zirconium and titanium partly replacing the silicon, $(Na_4,Ca_2,Mn_2,Zr)([Si,Zr]O_3)_2$.

333. Wöhlerite. Monoclinic; a calcium and sodium metasilicate, zirconate and niobate, $12(Na_2,Ca)(Si,Zr)O_3.(Na_2Ca)Nb_2O_6$.

γ. TRICLINIC SECTION.

334. Hiortdahlite. Triclinic; a sodium and calcium metasilicate and zirconate, $(Na_2,Ca)(Si,Zr)O_3$.

335. Rhodonite. Triclinic; manganese metasilicate, $MnO.SiO_2$.

VARIETIES :—

1. *Ordinary:*— (a) *Paisbergite, Crystallized,* (b) *Granular massive.* 2. *Ferriferous,* 3. *Bustamite,* 4. *Fowlerite.*

ALTERS TO :—Marceline, Dyssnite, Stratopeite, Allagite, Photicite, Hydrorhodonite, Klipsteinite.

336. Babingtonite. Triclinic; calcium, iron and manganese metasilicate, $(Ca,Fe,Mn)SiO_3$ with $Fe_2(SiO_3)_3$.

3. AMPHIBOLE GROUP.

α. ORTHORHOMBIC SECTION.

337. Anthophyllite. Orthorhombic; magnesium and iron metasilicate, $(Mg,Fe)SiO_3$.

VARIETIES :—1. *Ordinary*, 2. *Kupfferite*, 3. *Thalackerite.*

RELATED :—*Piddingtonite.*

β. MONOCLINIC SECTION.

338. Amphibole. Monoclinic; normal magnesium and calcium metasilicate, generally with some iron, manganese, aluminium, hydrogen, sodium and potassium.

VARIETIES :—

I. CONTAINING LITTLE OR NO ALUMINIUM.

1. *Tremolite, calcium magnesium amphibole,*
2. *Nordenskiöldite,*
3. *Raphilite,*
4. *Hexagonite,*
5. *Actinolite, calcium magnesium-iron amphibole,*
6. *Nephrite,*
7. *Asbestus,*
8. *Mountain leather,*
9. *Mountain cork,*
10. *Mountain wood*
11. *Byssolite,*
12. *Smaragdite,*
13. *Uralite,*
14. *Cummingtonite, iron-magnesium amphibole,*
15. *Antholite,*
16. *Dannemorite, iron-manganese amphibole,*
17. *Asbeferrite,*
18. *Silfbergite,*
19. *Hillängsite,*
20. *Grünerite, iron amphibole,*
21. *Richterite, sodium-magnesium-manganese amphibole,*
22. *Marmairolite,*
23. *Breislakite.*

II. ALUMINOUS :—

1. *Edenite, aluminous magnesium calcium amphibole,*
2. *Koksharovite,*
3. *Pargasite,*
4. *Common Black Hornblende,*
5. *Noralite,*
6. *Gamsigradite,*
7. *Diastatite,*
8. *Syntagmatite,*
9. *Bergamaskite*
10. *Kaersutite.*

ALTERS TO :—Magnesia-mica, Chlorite, Iron-ocher, Talc, Steatite, Serpentine, Epidote, Biotite, Pinite, Chabazite, Limonite, Magnetite.

RELATED :—*Kirwanite, Loganite, Paligorskite, Phaactinite, Waldheimite.*

339. Glaucophane. Monoclinic; sodium, aluminium, iron and magnesium metasilicate, $NaAl(SiO_3)_2.(Fe,Mg)SiO_3$.

340. Riebeckite. Monoclinic; sodium, ferrous and ferric iron metasilicate, $2Na_2Fe^{III}(SiO_3)_2.FeSiO_3$.

341. Crocidolite. Fibrous; sodium, ferrous and ferric iron metasilicate, $NaFe^{III}(SiO_3)_2.FeSiO_3$.

ALTERS TO :—Quartz and called "Tiger Eye."

342. Arfvedsonite. Monoclinic; slightly basic sodium, calcium and ferrous iron metasilicate, $4Na_2O.3CaO.14FeO.(Al,Fe)_2O_3.21SiO_2$.

RELATED :—342 A. *Barkevikite, Pterolite.*

γ. TRICLINIC SECTION.

343. Ænigmatite. Triclinic; sodium and ferrous iron titano-silicates, with some aluminium and ferric iron.

VARIETIES :—1. *Ordinary crystals*, 2. *Cossyrite.*

4. BERYL GROUP. Hexagonal.

344. Beryl. Hexagonal; beryllium and aluminium metasilicates, $3BeO.Al_2O_3.6SiO_2$.

VARIETIES :—

1. *Emerald*,
2. *Ordinary* :—
   (a) *Colorless*,
   (b) *Bluish-green* (*aquamarine*),
   (c) *Apple-green*,
   (d) *Yellow* (*golden beryl*),
   (e) *Yellowish-green*,
   (f) *Sapphire-blue*,
   (g) *Sky-blue*,
   (h) *Violet*,
   (i) *Brownish yellow.*
3. *Davidsonite*,
4. *Goshenite.*

RELATED :—*Rosterite, Pseudosmaragd.*

ALTERS TO :—Kaolin, Mica, Limonite, Quartz.

5. EUDIALYTE GROUP.

345. Eudialyte. Rhombohedral; sodium, potassium, calcium, iron, manganese metasilicate, with some cerium hydrate and zirconium oxychloride.

VARIETIES :—1. *Ordinary*, 2. *Eucolite.*

346. Catapleiite. Hexagonal (?); a sodium and calcium metasilicate and zirconate, $H_2(Na_2,Ca)(Zr(OH)_2)(SiO_3)_3$.

VARIETIES :—1. *Ordinary*, 2. *Natron-catapleiite.*

ALTERS TO :—Zircon.

6. MELANOCERITE GROUP.

347. Cappelenite. Hexagonal; an yttrium and barium boro-silicate, with sodium, potassium, calcium, and various rare earths.

348. Melanocerite. Rhombohedral; cerium, yttrium and calcium fluo-silicate, with some boron, tantalum, etc.

349. Caryocerite. Rhombohedral; near melanocerite, but containing more thorium.

RELATED :—*Steenstrupine.*

350. Tritomite. Rhombohedral; thorium, cerium, yttrium and calcium fluo-silicate, with some boron.

RELATED :—*Erdmannite.*

II. INTERMEDIATE SILICATES.

1. LEUCOPHANITE GROUP.

351. Leucophanite. Orthorhombic; sodium, beryllium and calcium fluo-silicate, $Na(BeF)Ca(SiO_3)_2$.

352. Meliphanite. Tetragonal; beryllium, calcium and sodium fluo-silicate, $NaCa_2Be_2FSi_3O_{10}$.

2. IOLITE GROUP.

353. Iolite. Orthorhombic; a magnesium, iron and aluminium silicate, $H_2O.4(Mg,FeO).4Al_2O_3.10SiO_2$.

VARIETIES :—1. *Ordinary*, 2. *Cerasite.*

ALTERS TO :—Fahlunite, Auralite, Chlorophyllite, Aspasiolite.

3. BARYSILITE GROUP.

354. Barysilite. Hexagonal; lead silicate, $3PbO.2SiO_2$.

355. Ganomalite. Tetragonal; lead, manganese and calcium silicate, $3PbO.2(Ca,Mn)O.3SiO_2$.

356. Hyalotekite. Massive; a lead, barium and calcium boro-silicate.

III. ORTHOSILICATES. R_2SiO_4.

1. NEPHELITE GROUP. Hexagonal.

357. Nephelite. Hexagonal; a sodium, potassium and aluminium orthosilicate, $3Na_2O.K_2O.4Al_2O_3.9SiO_2$.

VARIETIES:—1. *Glassy nephelite*, 2. *Elæolite*.

ALTERS TO:—Thomsonite, Analcite, Liebenerite, Gieseckite, Dysyntribite.

358. Eucryptite. Hex.; lithium and aluminium orthosilicate, $Li_2O.Al_2O_3.2SiO_2$.

359. Kaliophilite. Hexagonal; potassium and aluminium orthosilicate, $K_2O.Al_2O_3.2SiO_2$.

360. Cancrinite. Hexagonal; a calcium, sodium and aluminium orthosilicate with sodium carbonate, $3H_2O.4Na_2O.CaO.4Al_2O_3.9SiO_2.2CO_2$.

RELATED:—*Kalk-cancrinite*.

361. Microsommite. Hexagonal; a sodium, potassium, calcium and aluminium sulpho-chlor orthosilicate (?).

RELATED:—*Davyne, Cavolinite*.

2. SODALITE GROUP. Isometric.

362. Sodalite. Isom.; sodium and aluminium chloro-silicate, $Na_4(AlCl)Al_2Si_3O_{12}$.

ALTERS TO:—Kaolin, Thomsonite, Hydronephelite, Muscovite, Natrolite, Diaspore.

363. Haüynite. Isometric; sodium, calcium and aluminium orthosilicate with some sodium sulphate, $Na_2Ca(NaSO_4.Al)Al_2Si_3O_{12}$.

364. Noselite. Isometric; sodium and aluminium silicate and sodium sulphate, $Na_4(NaSO_4.Al)Al_2Si_3O_{12}$.

RELATED:—*Ittnerite*.

365. Lazurite. Isometric; sodium and aluminium orthosilicite and sodium sulphide, $Na_4(NaS_3.Al)Al_2Si_3O_{12}$.

3. HELVITE GROUP.

366. Helvite. Isometric; beryllium, manganese, and iron sulpho-silicate, $(Be,MnFe)_7Si_3O_{12}S$.

RELATED:—*Achtaragdite*.

367. Danalite. Isometric; beryllium, iron, zinc and manganese sulpho-silicate, $(Fe,Zn,Mn)_2((ZnFe)_2S)Be_3Si_3O_{12}$.

368. Eulytite. Isometric; bismuth orthosilicate, $2Bi_2O_3.3SiO_2$.

369. Zunyite. Isometric; basic aluminium orthosilicate, $(Al(OH,F,Cl)_2)_6Al_2Si_3O_{12}$.

4. GARNET GROUP.

370. Garnet. Isometric; an orthosilicate containing calcium, magnesium, ferrous iron or manganese and aluminium, ferric iron or chromium.

VARIETIES:—

I. ALUMINIUM GARNET.

A. *Grossularite, Calcium Aluminium Garnet, (Essonite Cinnamon Stone, Wiluite)*.
B. *Pyrope, Magnesium Aluminium Garnet, (Precious)*.
C. *Almandite, Iron-aluminium Garnet, (Precious, common)*.
D. *Spessartite, Manganese Aluminium Garnet*.

II. IRON GARNET.

E. *Andradite*.
1. *Calcium-iron Garnet,*
(a) *Topazolite, Demantoid,*
(b) *Colophonite,*
(c) *Melanite,*
(d) *Dark green, Jelletite, Calderite,*
2. *Manganesian Calcium-iron Garnet,*
(a) *Rothoffite,*
(b) *Allochroite,*
(c) *Polyadelphite,*
(d) *Aplome*.
3. *Titaniferous,*
4. *Yttriferous Calcium-iron Garnet, (Yttergarnet)*.

III. CHROMIUM GARNET.

F. *Uvarovite, Calcium-chromium Garnet.*

ALTERS TO :—Limonite, Magnetite, Hematite, Quartz, Epidote, Amphibole, Orthoclase, Steatite, Serpentine, Chlorite, Scapolite, Mica, Oligoclase.

RELATED :—*Trautwinite.*

371. Schorlomite. Isometric; calcium, iron and titanium silico-titanate, $3CaO.(Fe,Ti)_2O_3.3(SiTi)O_2$.

RELATED :—*Ivaarite.*

372. Partschinite. Monoclinic; manganese, iron and aluminium silicate, $(Mn,Fe)_3Al_2Si_3O_{12}$.

373. Agricolite. Monoclinic; bismuth orthosilicate, $Bi_4Si_3O_{12}$.

5. CHRYSOLITE GROUP.

374. Monticellite. Orthorh.; magnesium and calcium orthosilicate, $CaO.MgO.SiO_2$.

VARIETIES :—1. *Gray Crystals,* 2. *Batrachite.*

ALTERS TO :—Serpentine.

375. Forsterite. Orthorhombic; magnesium orthosilicate, $2MgO.SiO_2$.

VARIETIES :—1. *Forsterite,* 2. *Boltonite.*

376. Chrysolite. Orthorh.; magnesium and iron orthosilicate, $2(MgFe)O.SiO_2$.

VARIETIES :—

1. *Precious,*
2. *Olivine (Ordinary),*
3. *Hyalosiderite,*
4. *Glinkite.*

ALTERS TO :—Serpentine, Anthophyllite, Amphibole.

RELATED :—*Villarsite, Matricite, Ferrite, Hortonolite, Neochrysolite, Titan olivine.*

377. Fayalite. Orthorhombic; ferrous iron orthosilicate, $2FeO.SiO_2$.

378. Knebelite. Orthorhombic; an iron, manganese and magnesium orthosilicate, $2(Fe,Mn,Mg)O.SiO_2$.

VARIETIES :—1. *Ordinary,* 2. *Igelströmite.*

379. Tephroite. Orthorhombic; manganese orthosilicate, $2MnO.SiO_2$.

RELATED :—*Hydrotephroite, Epigenite.*

379A. Roepperite. Orthorhombic; iron, manganese, zinc and magnesium orthosilicate, $(Fe,Mn,Zn,Mg)_2SiO_4$.

6. PHENACITE GROUP.

380. Trimerite. Triclinic; manganese, calcium and beryllium orthosilicate, $(Mn,Ca)_2SiO_4.Be_2SiO_4$.

381. Willemite. Rhombohedral; zinc orthosilicate, $2ZnO.SiO_2$.

VARIETIES :—1. *Common,* 2. *Troostite,* 3. *Tephrowillemite.*

382. Phenacite. Rhombohedral; beryllium orthosilicate, $2BeO.SiO_2$.

383. Dioptase. Rhombohedral; basic copper orthosilicate, $H_2O.CuO.SiO_2$.

384. Friedelite. Rhombohedral; basic manganese chloride and orthosilicate, $H_7(MnCl)Mn_4Si_4O_{16}$.

385. Pyrosmalite. Rhombohedral; basic iron and manganese chloride and orthosilicate, $H_7((Fe,Mn)Cl)(Fe,Mn)_4Si_4O_{16}$.

7. SCAPOLITE GROUP.

386. Meionite. Tetragonal; calcium and aluminium silicate, $4CaO.3Al_2O_3.6SiO_2$.

VARIETIES :—1. *Ordinary Crystals,* 2. *Ersbyite.*

387. Wernerite. Tetragonal; aluminium, calcium and sodium chloro-silicate.

VARIETIES :—

1. *Ordinary Crystals,*
2. *Nuttalite,*
3. *Passauite,*
4. *Ontariolite,*
5. *Glaucolite,*
6. *Pink massive.*

ALTERS TO :—Pinite, Epidote, Steatite, Magnesia mica, Kaolin-like compound, Silica.

388. Mizzonite. Tetragonal; an aluminium, sodium and calcium chloro-silicate.

VARIETIES :—

1. *Ordinary,*
2. *Dipyre,*
3. *Couseranite,*
4. *Prehnitoid,*
5. *Riponite.*

389. Marialite. Tet.; sodium and aluminium chloro-silicate, $Na_4Al_3Si_9O_{24}Cl$.
ALTERED SCAPOLITES :—
Atheriastite, *Wilsonite*, *Pseudo-scapolite*,
Stroganovite, *Terenite*, *Paralogite*.
Algerite, *Gabronite*,

390. Sarcolite. Tetragonal; aluminium, calcium and sodium orthosilicate, $3(Ca\text{-}Na_2)O.Al_2O_3 3SiO_2$.

8. MELILITE GROUP.

391. Melilite. Tetragonal; a sodium, calcium, magnesium, aluminium and iron silicate, $Na_2(Ca,Mg)_{11}(Al,Fe)_4Si_9O_{36}(?)$.
RELATED :—*Akermanite*.

392. Gehlenite. Tet.; calcium and aluminium orthosilicate, $3CaO.Al_2O_3.2SiO_2$.
ALTERS TO :—Steatite, Fassaite, Grossularite.
RELATED :—*Cacoclasite*.

9. VESUVIANITE GROUP.

393. Vesuvianite. Tetragonal; a basic calcium-aluminium silicate, $H(OH)_3Ca_{12}\text{-}(Al,Fe)_6(SiO_4)_{10}(?)$.
VARIETIES :—1. *Ordinary*, 2. *Cyprine*.
ALTERS TO :—Steatite, Mica, Clinochlore, Diopside, Garnet.

10. ZIRCON GROUP.

394. Zircon. Tetragonal; zirconium silicate, $ZrO.SiO_2$.
VARIETIES :—
1. *Ordinary*, 3. *Hyacinth (gem)*, 5. *Beccarite*.
2. *Azorite*, 4. *Jargon*,
ALTERED ZIRCON :—
Malacon, *Œrstedite*, *Cyrtolite*,
Tachyaphaltite, *Auerbachite*, *Alvite*.

395. Thorite. Tetragonal; anhydrous thorium silicate, $ThO_2.SiO_2$.
VARIETIES :—1. *Thorite*, 2. *Orangite*, 3. *Uranothorite*.
RELATED :—*Calciothorite*, *Eucrasite*, *Freyalite*, *Auerlite*.

11. DANBURITE—TOPAZ GROUP.

396. Danburite. Orthorhombic; calcium and boron silicate, $CaO.B_2O_3.2SiO_2$.

397. Topaz. Orthorhombic; an aluminium fluo-silicate, $(Al(O,F_2))AlSiO_4$.
VARIETIES :—1. *Crystals*, 2. *Massive*, 3. *Physalite*, 4. *Pycnite*.
ALTERS TO :—Steatite, Damourite, Kaolin.

398. Andalusite. Orthorhombic; aluminium silicate, $Al_2O_3.SiO_2$.
VARIETIES :—1. *Ordinary Crystals*, 2. *Chiastolite*.
ALTERS TO :—Kaolin, Muscovite, Pinite, Cyanite.

399. Sillimanite. Orthorhombic; aluminium silicate, $Al_2O_3.SiO_2$.
VARIETIES :—1. *Sillimanite*, 2. *Fibrolite*, 3. *Bamlite*, 4. *Xenolite*, 5. *Wörthite*.
RELATED :—*Glancespar*, *Westanite*.

400. Cyanite. Triclinic; aluminium silicate, $Al_2O_3.SiO_2$.
ALTERS TO :—Talc, Steatite.

12. DATOLITE GROUP.

401. Datolite. Monoclinic; a basic calcium and boron orthosilicate, $H_2O.2CaO.\text{-}B_2O_3.2SiO_2$.
VARIETIES :—1. *Glassy Crystals*, 2. *Compact massive*, 3. *Botryoidal*.
ALTERS TO :—Chalcedony (called Haytorite).

402. Homilite. Monoclinic; calcium and iron boro-silicate, $2CaO.FeO.B_2O_3.2SiO_2$.
RELATED :—*Erdmannite*.

403. Euclase. Monoclinic; basic beryllium and aluminium orthosilicate, $H_2O.\text{-}2BeO.Al_2O_3.2SiO_2$.

404. Gadolinite. Monoclinic; a beryllium, iron and yttrium orthosilicate, $2BeO.\text{-}FeO.2Y_2O_3.2SiO_2$.
ALTERS TO :—Ocher-like mineral.

405. Yttrialite. Massive; chiefly a silicate of thorium and the yttrium metals.
RELATED :—*Yttrium silicate*.

13. EPIDOTE GROUP.

406. Zoisite. Orthorhombic; basic calcium and aluminium silicate, $4CaO.3Al_2O_3.6SiO_2.H_2O$.

VARIETIES:—1. *Ordinary*, 2. *Rose-red* (*Thulite*), 3. *Compact, massive.*

RELATED:—*Saussurite.*

407. Epidote. Monoclinic; basic calcium, aluminium and iron silicate, $H_2O.4CaO.3(Al,Fe)_2O_3.6SiO_2$.

VARIETIES:—

1. *Ordinary,*
   (a) *Crystals,*
   (b) *Fibrous,*
   (c) *Granular massive.*
   (d) *Scorza* (*sand*),
2. *Bucklandite,*
3. *Withamite,*
4. *Beustite,*
5. *Escherite.*

RELATED:—*Picroepidote.*

408. Piedmontite. Monoclinic; basic calcium, aluminium, manganese and iron silicate, $H_2O.4CaO.3(Al,Mn,Fe)_2O_3.6SiO_2$.

409. Allanite. Monoclinic; basic calcium, iron, aluminium, cerium and yttrium metals, orthosilicate, $H_2O.4(Ca,Fe)O._3(Al,Fe,Ce,Di,La,Y)_2O_3.6SiO_2$.

VARIETIES:—

1. *Ordinary,*
2. *Bucklandite,*
3. *Uralorthite,*
4. *Bagrationite,*
5. *Orthite,*
6. *Xanthorthite,*
7. *Pyrorthite.*

RELATED:—*Wasite, Muromontite, Bodenite.*

14. AXINITE GROUP.

410. Axinite. Triclinic; an aluminium and calcium boro-silicate, some iron and manganese, $H_2Ca_4(BO)Al_3(SiO_4)_5$(?).

ALTERS TO:—Chlorite.

ORTHOSILICATES NOT INCLUDED IN FOREGOING GROUPS.

411. Prehnite. Orthorh.; acid calcium and aluminium orthosilicate, $H_2Ca_2Al_2Si_3O_{12}$.

ALTERS TO:—Green earth, Feldspar.

RELATED:—*Uigite, Prehnitoid.*

412. Harstigite. Orthorhombic; an acid manganese and calcium orthosilicate, $H_7(Ca,Mn)_{12}Al_3Si_{10}O_{40}$(?).

413. Cuspidine. Monoclinic; contains silica, calcium, fluorine and carbon dioxide; formula doubtful.

IV. SUBSILICATES.

HUMITE GROUP.

414. Humite. Orthorhombic; magnesium fluo-silicate, $Mg_{13}(MgF)_4(MgOH)_2Si_3O_{32}$.

415. Chondrodite. Monoclinic; magnesium fluo-silicate.

ALTERS TO:—Serpentine.

416. Clinohumite. Monoclinic; magnesium fluo-silicate.

417. Ilvaite. Orthorhombic; calcium and ferrous and ferric iron silicate, $H_2O.CaO.4FeO.Fe_2O_3.4SiO_2$.

418. Ardennite. Orthorhombic; an aluminium and manganese vanadio-silicate, $5H_2O.8MnO.4Al_2O_3.V_2O_5.8SiO_2$(?).

419. Langbanite. Hexagonal; manganese silicate and ferrous iron antimonate, $37Mn_5SiO_7.10Fe_3Sb_2O_8$(?).

KENTROLITE GROUP.

420. Kentrolite. Orthorh.; lead and manganese silicate, $2PbO.Mn_2O_3.2SiO_2$(?).

421. Melanotekite. Massive; lead and ferric iron silicate, $2PbO.Fe_2O_3.2SiO_2$.

422. Bertrandite. Orthorhombic; basic beryllium orthosilicate, $H_2O.4BeO.2SiO_2$.

423. Calamine. Orthorhombic; basic zinc silicate, $H_2O.2ZnO.SiO_2$.

VARIETIES:—

1. *Ordinary:*—
   (a) *Crystals,*
   (b) *Stalactitic,*
   (c) *Massive,*
2. *Carbonated,*
3. *Argillaceous*
4. *Wagite.*

RELATED:—*Moresnetite, Vanuxemite*

424. Carpholite. Monoclinic; basic manganese, aluminium metasilicate(?), $2H_2O.MnO.Al_2O_3.2SiO_2$.

425. Cerite. Orthorhombic; calcium, iron and cerium silicate, $3H_2O.2(Ca,Fe)O.3Ce_2O_3.6SiO_2$(?).

426. Tourmaline. Rhombohedral; boron, aluminium and either magnesium, iron or alkali silicate.

VARIETIES:—

I. *Based on color:—*
- (a) *Rubellite,*
- (b) *Indicolite,*
- (c) *Brazilian Sapphire,*
- (d) *Brazilian Emerald,*
- (e) *Peridot of Ceylon,*
- (f) *Achroite,*
- (g) *Aphrizite.*
- (h) *Columnar and black.*

II. *Based on composition:—*
- (a) *Alkali Tourmaline,*
- (b) *Iron Tourmaline,*
- (c) *Magnesium Tourmaline,*
- (d) *Chromium Tourmaline.*

ALTERS TO:—Mica, Chlorite, Cookeite, Steatite.

RELATED:—*Zeuxite.*

427. Dumortierite. Orthorhombic; a basic aluminium silicate, $4Al_2O_3.3SiO_2$(?).

428. Staurolite. Orthorhombic; a basic iron, magnesium and aluminium silicate, $2H_2O.6(Fe,Mg)O.12Al_2O_3.11SiO_2$(?)

VARIETIES:—1. *Ordinary,* 2. *Nordmarkite,* 3. *Xantholite.*

ALTERS TO:—Steatite.

429. Kornerupine. Orthorhombic; magnesium and aluminium silicate, $MgO.Al_2O_3.SiO_2$.

RELATED:—Kryptotil.

430. Sapphirine. Monoc.; magnesium and aluminium silicate, $5MgO.6Al_2O_3.2SiO_2$.

APPENDIX TO ANHYDROUS SILICATES.

Barylite, *Monzonite,* *Ramosite,*
Hypochlorite, *Neociano,* *Sphenoclase.*
Bismutoferrite,

B. HYDROUS SILICATES.

I. ZEOLITE DIVISION.

1. INTRODUCTORY SUBDIVISION.

431. Inesite. Tric.; hydrous manganese and calcium silicate, $2(Mn,Ca)SiO_3+H_2O$.

432. Ganophyllite. Monoclinic; hydrous manganese and aluminium silicate, $6H_2O7MnO.Al_2O_3.8SiO_2$.

433. Okenite. Orthorhombic (?); hydrous calcium silicate, $2H_2O.CaO.2SiO_2$.

434. Gyrolite. In concretions; hydrous calcium silicate, $3H_2O.2CaO.3SiO_2$.

435. Apophyllite. Tetragonal; hydrous potassium and calcium silicate, $K_2O.8CaO.16SiO_2.16H_2O$.

VARIETIES:—

1. *Ordinary,*
2. *Oxhaverite,*
3. *Albine,*
4. *Xylochlore,*
5. *Tesselite,*
6. *Leucocyclite.*

OTHER HYDROUS CALCIUM SILICATES, NOT PERFECTLY DEFINED:—

Centrallassite, *Tobermorite,* *Plombierite,*
Xonotlite, *Chalcomorphite,* *Louisite.*

2. ZEOLITES.

MORDENITE GROUP.

436. Ptilolite. Masses of minute needles; hydrous calcium, sodium, potassium and aluminium silicate, $(Ca,K_2,Na_2)Al_2Si_{10}O_{24}+5H_2O$.

437 Mordenite. Monoclinic; hydrous calcium, sodium, potassium and aluminium silicate, $3(Ca,Na_2,K_2)Al_2Si_{10}O_{24}+20H_2O$.

RELATED:—*Steeleite, Pseudonatrolite.*

HEULANDITE GROUP. Monoclinic.

438. Heulandite. Monoclinic; hydrous calcium and aluminium silicate, $5H_2O.CaO.Al_2O_3.6SiO_2$.

RELATED :—*Oryzite.*

439. Brewsterite. Monoclinic; hydrous barium, strontium, calcium and aluminium silicate, $(Sr,Ba,Ca)O.Al_2O_3.6SiO_2.5H_2O$.

440. Epistilbite. Monoclinic; hydrous calcium and aluminium silicate, $CaO.Al_2O_3.6SiO_2.5H_2O$.

PHILLIPSITE GROUP. Monoclinic.

441. Phillipsite. Monoclinic; hydrous potassium, calcium and aluminium silicate, generally $(K_2,Ca)Al_2Si_4O_{12} + 4\frac{1}{2}H_2O$.

RELATED :—*Spangite.*

442. Harmotome. Monoclinic; hydrous potassium, barium and aluminium silicate, $(K_2,Ba)O.Al_2O_3.5SiO_2.5H_2O$.

443. Stilbite. Monoclinic ; hydrous sodium, calcium and aluminium silicate, generally $(Na_2,Ca)O.Al_2O_3.6SiO_2.6H_2O$.

VARIETIES :—1. *Crystallized,* 2. *Radiated,* 3. *Spherical* (*Sphærostilbite*).

ALTERS TO :—Quartz.

RELATED :—*Foresite.*

444. Gismondite. Monoclinic; hydrous calcium and aluminium silicate, with some potash, corresponds nearly to $CaAl_2Si_4O_{12} + 4H_2O$.

445. Laumontite. Monoclinic; hydrous calcium and aluminium silicate, $4H_2O.CaO.Al_2O_3.4SiO_2$.

VARIETIES :—

1. *Ordinary,*
2. *Leonhardite,*
3. *Caporcianite,*
4. *Schneiderite,*
5. *Ædelforsite.*

ALTERS TO :—Orthoclase.

446. Laubanite. Fibrous and radiating; hydrous calcium and aluminium silicate, $2CaO.Al_2O_3.5SiO_2 + 6H_2O$.

CHABAZITE GROUP. Rhombohedral.

447. Chabazite. Rhombohedral; hydrous calcium, sodium and aluminium silicate, usually corresponds to $(Ca,Na_2)Al_2Si_4O_{12} + 6H_2O$.

VARIETIES :—

1. *Ordinary,*
   (a) *Acadialite,*
   (b) *Haydenite,*
2. *Phacolite* (*Herschellite or Seebachite*).

RELATED :—*Doranite.*

448. Gmelinite. Rhombohedral; hydrous sodium, calcium and aluminium silicate, $(Na_2,Ca)Al_2Si_4O_{12}+6H_2O$.

RELATED :—*Groddeckite.*

449. Levynite. Rhombohedral; hydrous calcium and aluminium silicate, $CaAl_2Si_3O_{10}+5H_2O$.

RELATED :—*Mesolin.*

450. Analcite. Isometric; hydrous sodium and aluminium silicate, $Na_2O.Al_2O_3.4SiO_2.2H_2O$.

VARIETIES :—1. *Ordinary,* 2. *Euthallite,* 3. *Eudnophite.*

ALTERS TO :—Prehnite, Lithomarge.

Cluthalite is possibly an alteration.

451. Faujasite. Isometric; hydrous sodium, calcium and aluminium silicate, $Na_2O.CaO.2Al_2O_3.10SiO.20H_2O(?)$.

452. Edingtonite. Tetragonal; hydrous barium and aluminium silicate, $BaO.Al_2O_3.3SiO_2.3H_2O(?)$.

RELATED :—*Glottalite.*

NATROLITE GROUP.

453. Natrolite. Orthorhombic; hydrous sodium and aluminium silicate, $Na_2O.Al_2O_3.3SiO_2+2H_2O$.

VARIETIES :—

1. *Ordinary :—*
   (a) *Groups of slender prisms,*
   (b) *Fibrous radiated masses,*
   (c) *Solid amygdules,*
   (d) *Compact massive,*
2. *Fargite,*
3. *Radiolite,*
4. *Bergmannite* (*Spreustein*).

RELATED :—*Ellagite.*

454. Scolecite. Monoclinic; hydrous calcium and aluminium silicate, $CaO.Al_2O_3.3SiO_2.3H_2O$.

455. Mesolite. Monoclinic and triclinic; a hydrous calcium, sodium and aluminium silicate.

VARIETIES :—

1. *Ordinary,*
   (a) *Acicular and capillary,*
   (b) *Fibrous stalactites,*
   (c) *White amorphous,*
2. *Harringtonite,*
3. *Galactite.*

THOMSONITE GROUP.

456. Thomsonite. Orthorhombic; hydrous sodium, calcium and aluminium silicate, $(Na_2,Ca)O.Al_2O_3.2SiO_2.\frac{5}{2}H_2O$.

VARIETIES :—

1. *Ordinary,*
   (a) *Rectangular prisms,*
   (b) *Slender prisms,*
   (c) *Radiated fibrous,*
   (d) *Spherical concretions,*
   (e) *Ozarkite,*
2. *Mesole (Faroelite),*
3. *Scoulerite,*
4. *Chalilite.*

RELATED :—*Picrothomsonite.*

457. Hydronephelite. Hexagonal(?); hydrous sodium and aluminium silicate, usually $2Na_2O.3Al_2O_3.6SiO_2.7H_2O$.

VARIETIES :—1. *Ordinary,* 2. *Ranite.*

APPENDIX TO ZEOLITES.

Chlorastrolite, *Episphärite,* *Sloanite,*
Zonochlorite, *Sasbachite,* *Unknown Zeolite.*
Dolianite,

II. MICA DIVISION.

1. MICA GROUP. Monoclinic.

458. Muscovite. Monoclinic; hydrous potassium and aluminium orthosilicate. $2H_2O.K_2O.3Al_2O_3.6SiO_2$.

VARIETIES :—

1. *Ordinary Muscovite,*
2. *Damourite,*
   (a) *Sterlingite,*
   (b) *Margarodite,*
   (c) *Gilbertite,*
   (d) *Talcite,*
   (e) *Adamsite,*
   (f) *Ivigtite,*
   (g) *Sericite,*
   (h) *Metasericite,*
   (i) *Lepidomorphite,*
   (j) *Pycnophyllite,*
   (k) *Leucophyllite,*
3. *Oncosine,*
   (a) *Oncophyllite,*
   (b) *Didymite,*
4. *Fuchsite,*
5. *Avalite,*
6. *Oellacherite.*

ALTERS TO :—Steatite, Serpentine.

Pinite is probably an impure massive variety and includes a large number of alteration products as follows :—

Gigantolite, *Parophite,* *Wilsonite,*
Gieseckite, *Rosite,* *Killinite,*
Lythrodes, *Polyargite,* *Agalmatolite,*
Liebenerite, *Pinitoid,* *Oosite,*
Dysyntribite, *Hygrophilite,* *Cataspilite.*

459. Paragonite. Massive; a hydrous sodium and aluminium silicate, $2H_2O.Na_2O.3Al_2O_3.6SiO_2$.

VARIETIES :—1. *Ordinary,* 2. *Cossaite.*

RELATED :—*Euphyllite.*

460. Lepidolite. Crystalline; a potassium, lithium and aluminium basic fluo-silicate, $KLi[Al(OH,F)_2]Al(SiO_3)_3$.

RELATED :—*Cookeite.*

461. Zinnwaldite. Monoclinic; a basic potassium, lithium, iron and aluminium fluo-silicate, $(K,Li)_3FeAl_3Si_5O_{16}(OH,F)_2$.

VARIETIES:—1. *Ordinary,* 2. *Rabenglimmer,* 3. *Cryophyllite,* 4. *Polylithionite.*

RELATED:—*Protolithionite.*

462. Biotite. Monoclinic; potassium, magnesium, aluminium, ferrous and ferric iron orthosilicate, $(H,K)_2(Mg,\overset{II}{Fe})_2(\overset{III}{AlFe})_2(SiO_4)_3$.

VARIETIES :—

Divided into—I. Meroxene Ax.pl. $\parallel b$.
II. Anomite Ax.pl. $\perp b$.
1. *Barytbiotite*,
2. *Chromglimmer*.
3. *Siderophyllite*,
4. *Haughtonite*,
5. *Manganophyllite*.

RELATED:—*Rubellan, Eukamptite, Voigtite, Rastolyte, Hydrobiotite, Pseudobiotite, Bastonite.*

462A. Phlogopite. Monoclinic; potassium, magnesium and aluminium fluosilicate, $(H,K,(MgF))_3Mg_3Al(SiO_4)_3$.

RELATED:—*Aspidolite.*

462B. Lepidomelane. Hexagonal (?); potassium, aluminium, ferrous and ferric iron silicate, $(H,K)_2Fe_3(FeAl)_4(SiO_4)_5$.

RELATED :—*Pterolite, Alurgite, Helvetan.*

463. Roscoelite. Minute scales; a basic potassium, magnesium, iron, aluminium and vanadium silicate, $H_8K(Mg,Fe)(Al,V)_4(SiO_3)_{12}$(?).

2. CLINTONITE GROUP. Monoclinic.

464. Margarite. Monoc.; basic aluminium and calcium silicate, $H_2CaAl_4Si_2O_{12}$.

ALTERS TO :—Dudleyite.

465. Seybertite. Monoclinic; basic magnesium, calcium and aluminium silicate, $3H_2O.10(Mg,Ca)O.5Al_2O_3.4SiO_2$.

VARIETIES :—1. *Clintonite*, 2. *Brandisite.*

465A. Xanthophyllite. Monoclinic; a basic magnesium, calcium and aluminium silicate, $H_8(Mg,Ca)_{14}Al_{16}Si_5O_{52}$(?).

VARIETIES :—1. *Ordinary*, 2. *Waluewite.*

466. Chloritoid. Monoclinic or triclinic; a basic iron, magnesium and aluminium silicate, $H_2(Fe,Mg)Al_2SiO_7$.

VARIETIES :—1. *Ordinary*, 2. *Sismondine*, 3. *Masonite*, 4. *Salmite.*

467. Ottrelite. Monoclinic or triclinic; a basic iron, manganese and aluminium silicate, $H_2(Fe,Mn)Al_2Si_2O_9$(?).

VARIETIES :—1. *Ordinary*, 2. *Venasquite*, 3. *Phyllite.*

3. CHLORITE GROUP. Monoclinic.

468. Clinochlore. Monoclinic; basic magnesium and aluminium silicate, $4H_2O.5MgO.Al_2O_3.3SiO_2$.

VARIETIES :—

1 *Ordinary*,
(a) *Crystals*,
(b) *Foliated*,
(c) *Massive*,
2. *Leuchtenbergite*,
3. *Kotschubeite*,
4. *Manganiferous.*

468A. Penninite. Monoclinic, rhomboh. symmetry; basic magnesium, aluminium and iron silicate, $H_8(Mg,Fe)_5Al_2Si_3O_{18}$.

VARIETIES :—

1. *Penninite*,
2. *Hydrotalc*,
3. *Kämmererite*,
4. *Rhodochrome*,
5. *Loganite*,
6. *Pseudophite.*

RELATED :—*Tubergite.*

469. Prochlorite. Monoclinic; basic magnesium, iron and aluminium silicate.

RELATED :—*Grochauite.*

470. Corundophilite. Monoclinic; a basic magnesium and aluminium silicate, $H_{20}Mg_{11}Al_8Si_6O_{45}$.

RELATED :—*Amesite.*

471. Daphnite. Monoclinic; a basic iron and aluminium sil., $H_{56}Fe_{27}Al_{20}Si_{18}O_{121}$.

RELATED :—*Metachlorite, Klementite.*

472. Cronstedtite. Rhombohedral: a basic ferrous and ferric iron silicate, $4FeO.2Fe_2O_3.3SiO_2.4H_2O$(?).

473. Thuringite. Massive; a basic aluminium, ferrous and ferric iron silicate, $8FeO.4(Al,Fe)_2O_3.6SiO_2.9H_2O$.

RELATED :—*Chamosite, Berthierine.*

474. Stilpnomelane. Crystalline; a basic magnesium, aluminium, ferrous and ferric iron silicate, $2(Fe,Mg)O.(Fe,Al)_2O_3.5SiO_2.3H_2O(?)$.

VARIETIES:—1. *Ordinary*, 2. *Chalcodite*.

475. Strigovite. Minute prisms; a basic aluminium, ferrous and ferric iron silicate, $2FeO.(Fe,Al)_2O_3.2SiO_2.2H_2O$.

476. Diabantite. Monoclinic(?); a basic ferrous iron, magnesium and aluminium silicate, $12(Fe,Mg)O.2Al_2O_3.9SiO_3.9H_2O$.

477. Aphrosiderite. Massive; a basic aluminium, ferrous and ferric iron silicate, $H_{10}Fe_6(Fe,Al)_4Si_4O_{25}(?)$.

478. Delessite. Massive; a basic magnesium, aluminium, ferrous and ferric iron silicate, $H_{10}(Mg,Fe)_4(Al,Fe)_4Si_4O_{23}(?)$.

RELATED:—*Subdelessite*.

479. Rumpfite. Massive; a basic aluminium and magnesium silicate, $7MgO.8Al_2O_3.10SiO_2.14H_2O(?)$.

OTHER CHLORITIC MINERALS, IMPERFECTLY DEFINED.

Talc-chlorite of Traversella, *Epichlorite*, *Euralite*, *Epiphanite*, *Chlorophæite*, *Hullite*, *Melanolite*, *Ekmannite*, *Berlauite*, *Steatargillite*, *Pattersonite*, *Mineral from Webster, N. C.* *Mineral from Altenburg*, *Baltimorite*, *Dumasite*, *Prasilite*, *Grastite*, *Viridite*.

APPENDIX TO MICAS—VERMICULITES.

480. Jefferisite. Crystalline plates; a hydrous magnesium, aluminium, ferrous and ferric iron silicate, $H_{70}(Mg,Fe)_{53}(Al,Fe)_{42}Si_{57}O_{265}+82H_2O(?)$.

VARIETIES:—1. *Ordinary*, 2. *Culsageeite*, 3. *Pelhamite*.

Vermiculite, *Kerrite*, *Lucasite*, *Lennilite*, *Hallite*, *Painterite*, *Philadelphite*, *Protovermiculite*, *Vaalite*, *Maconite*, *Dudleyite*, *Pyrosclerite*, *Roseite*, *Willcoxite*.

III. SERPENTINE AND TALC DIVISION.

481. Serpentine. Monoclinic; a basic magnesium silicate, $3MgO.2SiO_2.2H_2O$.

VARIETIES:—

A. *In Crystals* (*probably pseudomorphs*),
B. *Massive*,
1. *Ordinary massive*, (a) *Precious*, (b) *Common*,
2. *Resinous* (*Retinalite*),
3. *Porcellanous*,
4. *Bowenite*,
C. *Lamellar*,
5. *Antigorite*,
6. *Williamsite*,
D. *Thin Foliated*,
7. *Marmolite*,
8. *Thermophyllite*,
E. *Fibrous*,
9. *Chrysotile* (*Asbestus of commerce*),
10. *Picrolite*,
F. *Serpentine Rocks*.

RELATED:—*Totaigite*, *Zöblitzite*, *Metaxoite*, *Hydrophite*, *Aphrodite*, *Cerolite*, *Limbachite*.

482. Deweylite. Amorphous; a hydrous basic magnesium silicate, $4MgO.3SiO_2.6H_2O$.

483. Genthite. Amorphous; a hydrous basic nickel and magnesium silicate, $2NiO.2MgO.3SiO_2.6H_2O$.

RELATED:—*Röttisite*.

483A. Garnierite. Amorphous; a hydrated magnesium and nickel silicate, $H_2(Ni,Mg)SiO_4 + aq.(?)$.

RELATED:—*De Saulesite*, *Pimelite*, *Alipite*, *Refdanskite*.

484. Talc. Orthorh. or monoc.; an acid magnesium metasilicate, $H_2O.3MgO.4SiO_2$.

VARIETIES:—

1. *Foliated, Talc*,
2. *Massive, Steatite or Soapstone*,
(a) *Potstone*,
(b) *French Chalk*,
(c) *Indurated talc*,
3. *Pseudomorphous*,
(a) *Fibrous*,
(b) *Rensselaerite*,
(c) *Pyrallolite*.

RELATED:—*Talcoid*.

485. Sepiolite. Compact; a basic magnesium silicate, $2H_2O.2MgO.3SiO_2$.
486. Connarite. Hexagonal(?); a hydrous nickel silicate, $2H_2O.2NiO_2.3SiO_2$(?).
487. Spadaite. Massive; a hydrous magnesium silicate, $5MgO.6SiO_2.4H_2O$(?).
488. Saponite. Massive; a hydrous magnesium and aluminium silicate(?).
489. Celadonite. Earthy; an iron, magnesium and potassium silicate.
490. Glauconite. Amorphous; a hydrous iron and potassium silicate essentially.
491. Pholidolite. Minute scales; a basic potassium, iron, magnesium and aluminium silicate, $5H_2O.K_2O.12(Fe,Mg)O.Al_2O_3.13SiO_2$(?).

IV. KAOLIN DIVISION.

492. Kaolinite. Monoclinic; a basic aluminium silicate, $2H_2O.Al_2O_3.2SiO_2$.

VARIETIES :—
1. *Crystals,* (a) *Argilliform,* (c) *Lithomarge,*
2. *Ordinary :—* (b) *Fariniform,* 3. *Ferruginous.*

RELATED :—*Meerschaluminite, Rectorite, Leverrierite.*

493. Halloysite. Massive; a hydrous basic aluminium silicate, $2H_2O.Al_2O_3.2SiO_2+aq$.
VARIETIES :—1. *Ordinary,* 2. *Smectite,* 3. *Lenzinite,* 4. *Bole.*
494. Newtonite. Rhomb.; a hydrous basic aluminium silicate, $Al_2O_3.2SiO_2.5H_2O$.
495. Cimolite. Amorphous; a hydrous aluminium silicate, $2Al_2O_3.9SiO_2.6H_2O$.
496. Montmorillonite. Massive; a hydrous basic aluminium silicate, $H_2Al_2Si_4O_{12}+n(aq)$(?).
VARIETIES :—1. *Montmorillonite,* 2. *Stolpenite.*
RELATED :—*Razoumovskyn.*
497. Pyrophyllite. Monoclinic (?); a basic aluminium silic., $H_2O.Al_2O_3.4SiO_2$.
VARIETIES :—1. *Foliated or radiated,* 2. *Compact massive.*
RELATED :—*Gümbelite, Neurolite, Biharite.*
498. Allophane. Amorphous; hydrous aluminium silicate, $Al_2SiO_5+5H_2O$.
RELATED :— *Kieselaluminite, Sulfatallophan, Plumballophane, Carolathine, Samoite.*
499. Collyrite. Amorphous; a hydrous aluminium silicate, $2Al_2O_3.SiO_2.9H_2O$.
RELATED :— *Dillnite.*
500. Schrötterite. Amorphous; a hydrous aluminium silicate, $8Al_2O_3.3SiO_2.30H_2O$.
RELATED :—*Scarbroite.*

APPENDIX TO CLAYS.

Sinopite, *Rhodalite,* *Oravitzite,*
Melinite, *Sphragidite,* *Hverlera,*
Ochran, *Ehrenbergit,* *Wolchonskoite,*
Plinthite, *Portite,* *Miloschite,*
Smectite, *Teratolite,* *Selwynite,*
Fuller's Earth, *Catlinite,* *Chrome Ocher.*
Malthacite, *Keffekilite,*

V. CONCLUDING DIVISION.

501. Cenosite. Orthorhombic or monoclinic; a hydrous calcium and yttrium silicate and carbonate, $Ca(Y,Er)_2(SiO_3)_4.CaCO_3.2H_2O$.
502. Thaumasite. Tetragonal or hexagonal; a hydrous calcium silicate, carbonate and sulphate, $CaSiO_3.CaCO_3.CaSO_4.15HO_2$.
503. Uranophane. Orthorhombic; a hydrous uranium and calcium silicate, $CaO.2UO_3.2SiO_2+6H_2O$.
504. Chrysocolla. Cryptocrystalline; hydrous copper silicate, $CuSiO_3+2H_2O$.

VARIETIES :—
1. *Ordinary,* 4. *Pilarite,* 6. *Cyanochalcite,*
2. *Dillenburgite,* 5. *Demidovite,* 7. *Asperolite,*
3. *Copper pitch-blende,*

RELATED :—*Kupferblau.*
505. Chloropal. Amorphous; a hydrated iron silicate, $Fe_2O_3.3SiO_2.5H_2O$(?).
VARIETIES :—1. *Ordinary,* 2. *Nontronite,* 3. *Pinguite,* 4. *Fettbol,* 5. *Graminite.*
RELATED :—*Glasurite, Protonontronite, Anthosiderite.*

506. Hisingerite. Amorphous; a hydrated ferric silicate.
VARIETIES:—1. *Hisingerite*, 2. *Degeröite*, 3. *Scotiolite.*
RELATED:—*Gillingite, Jollyte, Melanosiderite, Avasite.*

507. Bementite. Stellate masses; a hydrous manganese silicate, $2MnSiO_3.H_2O$ (approximately).

508. Caryopilite. Massive; a hydrous manganese silicate, $4MnO.3SiO_2.3H_2O$ (approximately).

509. Neotocite. Amorphous; a hydrous manganese and iron silicate.
RELATED:—*Penwithite.*

APPENDIX TO HYDROUS SILICATES.

Allophite,
Antillite,
Aquacreptite,
Arctolite,
Balvraidite,
Barettite,
Bhreckite,
Bravaisite,
Chonicrite,
Davreuxite,
Dermatin,
Duporthite,
Ephesite,
Lesleyite,
Forchhammerite,
Ginilsite,
Groppite,
Hydrosilicite,
Leidyite,
Leucotile,
Lillite,
Melopsite,
Næsumite,
Nefedieffite,
Neolite,
Nigrescite,
Pelhamine,
Persbergite,
Picrofluite,
Picrosmine,
Pihlite,
Pilinite,
Pilolite,
Polyhydrite,
Pyknotrop,
Pyroïdesine,
Quincite,
Restormelite,
Rubislite,
Stübelite,
Talcosite,
Venerite,
Xylotile.

Titano-silicates, titanates.

510. Titanite. Monoclinic; calcium titano-silicate, $CaO.TiO_2.SiO_2$.
VARIETIES:—
1. *Ordinary:—*
(a) *Titanite,*
(b) *Sphene,*
(c) *Ligurite,*
(d) *Spinthere,*
(e) *Lederite,*
(f) *Titanomorphite,*
2. *Manganesian, Greenovite,*
3. *Containing yttrium or cerium,*
(a) *Grothite,*
(b) *Alshedite,*
(c) *Eucolite-titanite.*

ALTERS TO:—Rutile, Octahedrite, Perovskite, Xanthitane.
RELATED:—*Pyromelane, Castellite.*

511. Keilhauite. Monoclinic; a calcium, aluminium, ferric iron and yttrium titano-silicate, $15CaSiTiO_5.(Al,Fe,Y)_2(Si,Ti)O_5(?)$.

512. Guarinite. Orthorhombic; calcium titano-silicate, $CaO.TiO_2.SiO_2$.

513. Tscheffkinite. Massive; chiefly a thorium and cerium metals titano-silicate.

514. Astrophyllite. Orthorhombic; a sodium, potassium, iron and manganese titano-silicate, $(Na,K)_4(Fe,Mn)_4Ti(SiO_4)_4$.

515. Johnstrupite. Monoclinic; a complex cerium, calcium and sodium titano-fluo-silicate.

516. Mosandrite. Monoclinic; a cerium, calcium and sodium titano-fluo-silicate.

517. Rinkite. Monoclinic; a sodium, calcium and cerium titano-fluo-silicate. $(F_8Ti_4)Na_9Ca_{11}Ce_3(SiO_4)_{12}(?)$.

518. Perovskite. Isometric or pseudo-isometric; calcium titanate, $CaTiO_3$.

519. Dysanalyte. Isometric; a calcium and iron titano-niobate, approximately $6(Ca,Fe)TiO_3.(Ca,Fe)Nb_2O_6$.
Hydrotitanite is an altered Dysanalyte.

3. Niobates, Tantalates.

1. PYROCHLORE GROUP. Isometric.

520. Pyrochlore. Isometric; chiefly calcium and cerium niobate with titanium, thorium and sodium fluoride.

520A. Koppite. Isometric; essentially a calcium and cerium pyroniobate.

521. Hatchettolite. Isometric; uranium tantalo-niobate.

522. Microlite. Isometric; essentially calcium pyrotantalate, $Ca_2Ta_2O_7$.
RELATED :—*Pyrrhite.*

2. FERGUSONITE GROUP. Tetragonal.

523. Fergusonite. Tetragonal; essentially yttrium, erbium, cerium, uranium, iron and calcium metaniobate and tantalate, $(Y,Er,Ce)(Nb,Ta)O_4$.
RELATED :—*Rutherfordite, Kochelite.*
524. Sipylite. Tetragonal; chiefly erbium niobate, $ErNbO_4$.
RELATED :—*Adelpholite.*

3. COLUMBITE GROUP. Orthorhombic.

525. Columbite. Orthorhombic; ferrous iron and manganese niobate, $(Fe,Mn)Nb_2O_6$.
NOTE :—Columbite graduates chemically into the next species, Tantalite.
526. Tantalite. Orthorhombic; iron tantalate, $FeTa_2O_6$.
526A. Skogbölite. Orthorhombic; essentially an iron tantalate, $FeTa_2O_6$.
RELATED :—*Ixiolite, Mengite, Hermannolite, Ferro-ilmenite.*
527. Tapiolite. Tetragonal; an iron tantalate and niobate, $Fe(Ta,Nb)_2O_6$.

4. SAMARSKITE GROUP. Orthorhombic.

528. Yttrotantalite. Orthorhombic; chiefly a yttrium metals and iron tantalo-niobate.
529. Samarskite. Orthorhombic; chiefly yttrium, cerium, iron and uranium tantalo-niobate.
RELATED :—*Nohlite, Vietinghofite.*

530. Ånneröodite. Orthorh.; essentially a uranium and yttrium pyro-niobate.
531. Hielmite. Orthorhombic; an iron, yttrium, manganese and calcium stanno-tantalate and niobate.

AESCHYNITE GROUP. Orthorhombic.

532. Aeschynite. Orthorhombic; a cerium metals, iron and calcium niobate and thoro-titanate, $\overset{III}{R}_2Nb_4O_{13}.\overset{III}{R}_2(Ti,Th)_5O_{13}(?)$.
533. Polymignite. Orthorhombic; a cerium metals, iron and calcium niobate and titano-zirconate, $5RTiO_3.5RZrO_3.R(Nb,Ta)_2O_6(?)$.
534. Euxenite. Orthorhombic; an yttrium, erbium, cerium and uranium niobate and titanate, $\overset{III}{R}(NbO_3)_3.\overset{III}{R}_2(TiO_3)_3.\frac{1}{2}H_2O(?)$.
535. Polycrase. Orthorhombic; an yttrium, erbium, cerium and uranium niobate and titanate, $\overset{III}{R}(NbO_3)_3.2\overset{III}{R}(TiO_3)_3.3H_2O$.

APPENDIX TO NIOBATES, TANTALATES.

Arrhenite. *Blomstrandite,* *Rogersite.*

4. Phosphates, Arsenates, Vanadates, Antimonates.

A. ANHYDROUS PHOSPHATES, VANADATES, ARSENATES, ANTIMONATES.

1. INTRODUCTORY SUBDIVISION.

536. Xenotime. Tetragonal; essentially yttrium phosphate, $Y_2O_3.P_2O_5$.
537. Monazite. Monoclinic; essentially phosphate of the cerium metals, $(Ce,La,Di)PO_4$, with some ThO_2.
RELATED :—*Kårarfvcite.*
538. Berzeliite. Isometric; calcium magnesium and manganese orthoarsenate, $(Ca,Mg,Mn)_3As_2O_8$.
RELATED :—*Pseudoberzeliite.*
539. Monimolite. Isometric; a lead, iron and calcium antimonate, $(Pb,Fe,Ca)_3Sb_2O_8$.
VARIETIES :—1. *Contains calcium,* 2. *Without calcium.*

540. Caryinite. Massive, monoclinic(?); a lead, manganese, calcium and magnesium arsenate, $(Pb,Mn,Ca,Mg)_3As_2O_8(?)$.

541. Carminite. Orthorhombic; a lead and iron arsenate, $Pb_3As_2O_8.10FeAsO_4(?)$

542. Pucherite. Orthorhombic; bismuth vanadate, $Bi_2O_3.V_2O_5$.

2. TRIPHYLITE GROUP. Orthorhombic.

543. Triphylite. Orthorhombic; an iron, manganese and lithium phosphate, $Li(Fe,Mn)PO_4$.

NOTE :—Triphylite graduates chemically into the next species, Lithiophilite.

544. Lithiophilite. Orthorhombic; a manganese, iron and lithium phosphate, $Li(Mn,Fe)PO_4$.

RELATED :—*Melanchlor, Heterosite, Pseudotriplite, Alluaudite.*

545. Natrophilite. Orthorh.; sodium and manganese phosphate, $Na_3PO_4.Mn_3P_2O_8$.

546. Beryllonite. Orthorh.; beryllium and sodium phosphate, $Na_3PO_4.Be_3P_2O_8$.

547. Herderite. Orthorhombic; a beryllium and calcium fluo-phosphate, $(CaF)BePO_4$.

548. Hamlinite. Rhombohedral; an aluminium or beryllium phosphate with water and fluorine.

3. APATITE GROUP. Hexagonal with pyramidal hemihedrism.

549. Apatite. Hexagonal; calcium phosphate with either calcium fluoride or calcium chloride, $3Ca_3P_2O_8+CaF_2$ or $3Ca_3P_2O_8+CaCl_2$.

VARIETIES :—(Divided into fluor-apatites and chlor-apatites.)

1. *Ordinary crystallized:*
   (a) *Asparagus-stone,* (b) *Lasurapatite.* (c) *Francolite,* (d) *Cupro-apatite,*
2. *Manganapatite,*
3. *Fibrous (Phosphorite),*
4. *Earthy apatite,*
5. *Pseudoapatite,*
6. *Staffelite.*

RELATED :—*Osteolite, Epiphosphorite, Talc-apatite, Hydroapatite, Phosphatic Nodules, Guano.*

550. Pyromorphite. Hexagonal; lead chloride and phosphate, $3Pb_3P_2O_8.PbCl_2$.

VARIETIES :—

1. *Ordinary :—*
   (a) *Crystals,* (b) *Acicular,* (c) *Concretionary masses,* (d) *Fibrous,* (e) *Granular,* (f) *Earthy.*
2. *Polysphærite.*
   (a) *Miesite,* (b) *Nussierite,* (c) *Cherokine,*
3. *Chromiferous.*
4. *Arseniferous,*
5. *Pseudomorphous,*
   (a) *after galenite,* (b) *after cerussite.*

ALTERS TO :—Galenite, Cerussite, Calamine, Calcite, Limonite.

551. Mimetite. Hexagonal; lead arsenate and lead chloride, $3Pb_3As_2O_8.PbCl_2$.

VARIETIES :—

1. *Ordinary :—*
   (a) *In crystals,* (b) *Capillary,* (c) *Concretionary,*
2. *Calciferous,*
3. *Campylite.*

Endlichite.—Hexagonal; intermediate between Mimetite and Vanadinite. Contains nearly equal portions of lead arsenate and vanadate, with chloride.

552. Vanadinite. Hexagonal; lead vanadate and lead chloride, $3Pb_3V_2O_8.PbCl_2$.

RELATED :—*Hedyphane, Pleonectite.*

4. WAGNERITE GROUP. Monoclinic.

553. Wagnerite. Monoclinic; magnesium fluo-phosphate, $Mg_3P_2O_8.MgF_2$.

VARIETIES :—1. *Wagnerite,* 2. *Kjerulfine.*

RELATED :—*Cryphiolite.*

554. Spodiosite. Orthorhombic(?); a calcium fluo-phosphate, $Ca_3P_2O_8.CaF_2(?)$.

555. Triplite. Monoclinic; an iron, manganese, calcium and magnesium fluo-phosphate, $R_3P_2O_8.RF_2$.

VARIETIES :—1. *Ordinary,* 2. *Zwieselite,* 3. *Talktriplite.*

RELATED :—*Griphite, Sarcopside.*

556. Triploidite. Monoclinic; basic manganese and iron phosphate, $4(Mn,Fe)O.P_2O_5.H_2O$.

557 Sarkinite. Monoclinic; basic manganese arsenate, $4MnO.As_2O_5.H_2O$.

VARIETIES :—1. *Sarkinite,* 2. *Polyarsenite.*

5. AMBLYGONITE GROUP.

558. Durangite. Monoc.; a sodium and aluminium fluo-arsenate, $AlAsO_4.NaF$.
559. Amblygonite. Tric.; an aluminium and lithium fluo-phosphate, $AlPO_4.LiF$.

B. ACID AND BASIC PHOSPHATES, ARSENATES, ETC.

560. Monetite. Triclinic; acid calcium phosphate, $2CaO.P_2O_5.H_2O$.
RELATED :—*Natrophite.*

OLIVENITE GROUP. Orthorhombic.

561. Olivenite. Orthorhombic; basic copper arsenate, $4CuO.As_2O_5.H_2O$.
VARIETIES :—(a) *Crystallized*, (b) *Fibrous* (*wood-copper*), (c) *Earthy.*
562. Libethenite. Orthorhombic; basic copper phosphate, $4CuO.P_2O_5.H_2O$.
563. Adamite. Orthorhombic; basic zinc arsenate, $4ZnO.As_2O_5.H_2O$.
564. Descloizite. Orthorhombic; basic lead and zinc vanadate, $(Pb,Zn)_2(OH)VO_4$.
VARIETIES :—1. *Ordinary crystals*, 2. *Cuprodescloizite.*
RELATED :—*Eusynchite, Dechenite.*
565. Calciovolborthite. Probably a basic copper and calcium vanadate, $4(Cu,Ca)O.V_2O_5.H_2O(?)$.
566. Brackebuschite. Monoclinic(?); perhaps a basic lead, iron and manganese vanadate, $(Pb,Fe,Mn)_3V_2O_8.H_2O(?)$.
567. Psittacinite. Crypto-crystalline coating; a hydrous, basic, lead and copper vanadate, $(Pb,Cu)_4(OH)_2V_2O_8.H_2O(?)$.
RELATED :—*Mottramite, Chileite, Vanadiolite, Wicklowite.*
568. Erinite. Crystalline groups; basic copper arsenate, $5CuO.As_2O_5.2H_2O$.
569. Dihydrite. Monoclinic or triclinic; essentially a basic copper phosphate, $5CuO.P_2O_5.2H_2O$.
570. Pseudomalachite. Massive; a basic copper phosphate, $6CuO.P_2O_5.3H_2O(?)$.
RELATED :—*Ehlite.*
571. Clinoclasite. Monoclinic; a basic copper arsenate, $6CuO.As_2O_5.3H_2O$.
572. Chondrarsenite. Embedded grains; a basic manganese arsenate, perhaps $6MnO.As_2O_5.3H_2O$.
RELATED :—*Xantharsenite.*
573. Dufrenite. Orthorh.; a basic ferric iron phosphate, partly $2Fe_2O_3.P_2O_5.3H_2O$.
574. Lazulite. Monoclinic; a basic iron, aluminium and magnesium phosphate, $(Fe,Mg)O.Al_2O_3.P_2O_5.H_2O$.
575. Tavistockite. Microscopic acicular crystals; a basic calcium and aluminium phosphate, $3CaO.Al_2O_3.P_2O_5.3H_2O$.
576. Cirrolite. Compact; a basic calcium and aluminium phosphate, $6CaO.2Al_2O_3.3P_2O_5.3H_2O(?)$.
577. Arseniosiderite. Tetragonal or hexagonal(?); basic iron and calcium arsenate, $6CaO.4Fe_2O_3.3As_2O_5.9H_2O$.
578. Allactite. Monoclinic; basic manganese arsenate, $7MnO.As_2O_5.4H_2O$.
579. Synadelphite. Monoclinic; basic manganese and aluminium arsenate, $2(Al,Mn)AsO_4.5Mn(OH)_2$.
580. Flinkite. Orthorh.; basic manganese arsenate, $4MnO.Mn_2O_3.As_2O_5.4H_2O$.
581. Hematolite. Rhombohedral; a basic manganese and aluminium arsenate, $(AlMn)AsO_4.4Mn(OH)_2$.
582. Arsenioplеite. Massive; a basic manganese, calcium, lead, magnesium and iron arsenate, $9(Mn,Ca,PbMg)O.(MnFe)_2O_3.3As_2O_5.3H_2O(?)$.
RELATED :—*Pleurasite.*
583. Manganostibiite. Orthorhombic (?); basic manganese antimonate, $10MnO.Sb_2O_5(?)$.
RELATED :—*Ferrostibian, Stibiatil.*
584. Atelestite. Monoclinic; basic bismuth arsenate, $3Bi_2O_3.As_2O_5.2H_2O$.

C. HYDROUS PHOSPHATES, ARSENATES, ETC.—NORMAL DIVISION.

585. Struvite. Orthorhombic; hydrous magnesium and ammonium phosphate, $NH_4MgPO_4+6H_2O$.
RELATED (*Guano Minerals*) :—

Guanapite,	*Oxammite,*	*Epiglaubite,*	*Dittmarite,*
Guanoxalate,	*Phosphammite,*	*Redondite,*	*Müllerite.*

586. Collophanite. Amorphous; hydrous calcium phosphate, $3CaO.P_2O_5.H_2O$.
RELATED :—*Pyrophosphorite.*
587. Hopeite. Orthorhombic; probably hydrous zinc phosphate, $Zn_3P_2O_8+H_2O$.
588. Dickinsonite. Monoclinic; a hydrous manganese, iron, sodium, calcium, potassium and lithium phosphate, $3(Mn,Fe,Na_2,Ca,K_2,Li_2)_3P_2O_8+H_2O$.
589. Fillowite. Monoclinic; a hydrous manganese, iron, calcium and sodium phosphate, $3(Mn,Fe,Ca,Na_2)_3P_2O_8+H_2O$.

ROSELITE GROUP. Triclinic.

590. Roselite. Triclinic; hydrous calcium, cobalt and magnesium arsenate, $(Ca,Co,Mg)_3As_2O_8.2H_2O$.
591. Brandtite. Triclinic; hydrous calcium and manganese arsenate, $2CaO.MnO.As_2O_5.2H_2O$.
592. Fairfieldite. Triclinic; hydrous calcium and manganese phosphate, $Ca_2MnP_2O_8+2H_2O$.
593. Messelite. Tric.; hydrous calcium and iron phosphate, $(Ca,Fe)P_2O_8+2\frac{1}{2}H_2O$.
594. Reddingite. Orthorhombic; hydrous manganese phosphate, $Mn_3P_2O_8+3H_2O$.
595. Picropharmacolite. Spherical; hydrous calcium and magnesium arsenate, $(Ca,Mg)_3As_2O_8+6H_2O$.
596. Trichalcite. Radiating and dendritic; hydrous copper arsenate, $Cu_3As_2O_8+5H_2O$.
RELATED :—*Lavendulan, Chlorotile.*

VIVIANITE GROUP. Monoclinic.

597. Vivianite. Monoclinic; hydrous ferrous iron phosphate, $Fe_3P_2O_8+8H_2O$.
598. Symplesite. Monoclinic; hydrous iron arsenate, probably $Fe_3As_2O_8+8H_2O$.
599. Bobierrite. Monclinic; hydrous magnesium phosphate, $Mg_3P_2O_8+8H_2O$.
600. Hœrnesite. Monoclinic; hydrous magnesium arsenate, $Mg_3As_2O_8+8H_2O$.
601. Erythrite. Monoclinic; hydrous cobalt arsenate, $Co_3As_2O_8+8H_2O$.
VARIETIES :—1. *Crystallized*, 2. *Earthy* (*cobalt bloom*).
602. Annabergite. Monoclinic; hydrous nickel arsenate, $Ni_3As_2O_8+8H_2O$.
603. Cabrerite. Monoclinic; hydrous nickel and magnesium arsenate, $(Ni,Mg)_3As_2O_8+8H_2O$.
604. Köttigite. Monoclinic; hydrous zinc arsenate, $Zn_3As_2O_8+8H_2O$. Cobalt and nickel replace some zinc.
605. Rhabdophanite. Massive; a hydrous phosphate of the cerium and yttrium metals, $(La,Di,Y)PO_4+H_2O$.
606. Churchite. Monoclinic (?); a hydrous cerium, didymium and calcium phosphate, $CePO_4+4H_2O$.

SCORODITE GROUP. Orthorhombic.

607. Scorodite. Orthorhombic; hydrous ferric iron arsenate, $Fe_2O_3.As_2O_5.4H_2O$.
ALTERS TO :—Limonite.
RELATED —*Jogynaite.*
608. Strengite. Orthorhombic; hydrous ferric iron phosphate, $Fe_2O_3.P_2O_5.4H_2O$.
609. Phosphosiderite. Orthorhombic; a hydrous ferric iron phosphate, $Fe_2O_3.P_2O_5.3\frac{1}{2}H_2O$.
610. Barrandite. Spheroidal concretions; hydrous aluminium and iron phosphate, $(AlFe)_2O_3.P_2O_5.4H_2O$.
611. Variscite. Orthorhombic; hydrous aluminium phosphate, $Al_2O_3.P_2O_5.4H_2O$.
RELATED :—*Planerite, Amphithalite.*
612. Callainite. Massive; hydrous aluminium phosphate, $Al_2O_3.P_2O_5.5H_2O$.
613. Zepharovichite. Crystalline; a hydrous aluminium phosphate, $AlPO_4.3H_2O$.
RELATED :—*Gibbsite.*
614. Koninckite. Radiated; hydrous ferric iron phosphate, $Fe_2O_3.P_2O_5.6H_2O$.

HYDROUS PHOSPHATES, ETC.—ACID DIVISION.

615. Stercorite. Monoclinic; hydrous acid sodium ammonium phosphate, $HNa(NH_4)PO_4+4H_2O$.
616. Haidingerite. Orthor.; hydrous acid calcium arsenate, $2CaO.As_2O_5.3H_2O$.
617. Pharmacolite. Monoc.; hydrous acid calcium arsenate, $2CaO.As_2O_5.5H_2O$.
618. Brushite. Monoclinic; a hydrous acid calcium phosphate, $2CaO.P_2O_5.5H_2O$.

619. **Metabrushite.** Monoc.; a hydrous acid calcium phosphate, $4CaO.2P_2O_5.7H_2O$.
ALTERED METABRUSHITE :—Zeugite, Ornithite.
620. **Martinite.** Rhomb.; hydrous acid calcium phosphate, $5CaO.P_2O5.\frac{3}{2}H_2O$.
621. **Newberyite.** Orthorhombic; hydrous acid magnesium phosphate, $2MgO.P_2O_5.7H_2O$.
622. **Wapplerite.** Monoclinic (or triclinic): hydrous acid calcium arsenate, $2CaO.As_2O_5.8H_2O$.
RELATED :—*Rösslerite.*
623. **Hannayite.** Triclinic; a hydrous acid magnesium and ammonium phosphate, $(NH_4)_2O.3MgO.2P_2O_5.10H_2O$.
624. **Hureaulite.** Monoclinic: a hydrous acid manganese phosphate, $5MnO.2P_2O_5.5H_2O$.
VARIETIES :—(a) *Brownish-orange (ordinary)*, (b) *Rose-violet*, (c) *Pale rose.*
625. **Forbesite.** Fibro-crystalline; hydrous acid nickel and cobalt arsenate, $H_2(Ni,Co)_2As_2O_8 + 8H_2O$.

HYDROUS PHOSPHATES, ETC.—BASIC DIVISION.

626. **Isoclasite.** Monoc.(?); hydrous basic calcium phosphate, $4CaO.P_2O_5.5H_2O$.
627. **Hemafibrite.** Orthorhombic; hydrous basic manganese arsenate, $6MnO.As_2O_5.5H_2O$.
628. **Conichalcite.** Reniform and massive; a hydrous basic copper and calcium arsenate, perhaps $4(Cu,Ca)O.As_2O_5.1\frac{1}{2}H_2O$.
629. **Bayldonite.** Mammillary concretions; hydrous basic lead and copper arsenate, $4(Pb,Cu)O.As_2O_5.2H_2O$.
630. **Tagilite.** Monoclinic; hydrous basic copper phosphate, $4CuO.P_2O_5.3H_2O$.
631. **Leucochalcite.** Acicular; a hydrous basic copper arsenate, probably $4CuO.As_2O_5.3H_2O$.
632. **Euchroite.** Orthorh.; a hydrous basic copper arsenate, $4CuO.As_2O_5.7H_2O$.
633. **Volborthite.** Six-sided tables; a hydrous basic copper, calcium and barium vanadate, perhaps $(Cu,Ca,Ba)_3(OH)_3VO_4 + 6H_2O$.
634. **Cornwallite.** Massive; a hydrous basic copper arsenate, $5CuO.As_2O_5.3H_2O$.
635. **Tyrolite.** Orthorhombic; a hydrous basic copper arsenate, perhaps $5CuO.As_2O_5.9H_2O$.
636. **Chalcophyllite.** Rhombohedral; hydrous basic copper arsenate, $7CuO.As_2O_5.14H_2O(?)$.
ALTERS TO :—Chrysocolla.
637. **Veszelyite.** Monoclinic(?); a hydrous basic copper and zinc phospho-arsenate, $(CuZn)_7(OH)_8(As,P)_2O_8 + 5H_2O$.
638. **Ludlamite.** Monoclinic; a hydrous basic iron phosphate, $7FeO.2P_2O_5.9H_2O$.
639. **Wavellite.** Orthorhombic; hydrous basic aluminium phosphate, $3Al_2O_3.2P_2O_5.12H_2O$.
RELATED:—*Lime-wavellite.*
640. **Fischerite.** Orthorhombic; hydrous basic aluminium phosphate, $2Al_2O_3.P_2O_5.8H_2O$.
641. **Peganite.** Orthorhombic; a hydrous basic aluminium phosphate, $2Al_2O_3.P_2O_5.6H_2O$.
642. **Turquois.** Massive; a hydrous basic aluminium phosphate, $2Al_2O_3.P_2O_5.5H_2O$.
643. **Sphærite.** Globular concretions; a hydrous basic aluminium phosphate, perhaps $5Al_2O_3.2P_2O_5.16H_2O$.
644. **Liskeardite.** Massive; hydrous basic aluminium and iron arsenate, $3(Al,Fe)_2O_3.As_2O_5.16H_2O$.
645. **Evansite.** Massive; hydrous basic aluminium phosphate, $3Al_2O_3.P_2O_5.18H_2O$.
RELATED :—*Cœruleolactite, Taranakite, Berlinite, Trolleite, Angelite, Attacolite.*
646. **Pharmacosiderite.** Isometric ; hydrous basic iron arsenate, $4Fe_2O_3.3As_2O_5.15H_2O$.
ALTERS TO :—Psilomelane, Limonite, Hematite.
647. **Cacoxenite.** Radiated tufts; hydrous basic iron phosphate, $2Fe_2O_3.P_2O_5.12H_2O$.
648. **Beraunite.** Monoclinic; hydrous basic iron phosphate, $3Fe_2O_3.2P_2O_5.8H_2O$.
VARIETIES :—1. *Beraunite*, 2. *Eleonorite.*
RELATED :—*Globosite, Picite, Delavauxite.*
649. **Childrenite.** Orthorhombic; a hydrous basic iron, aluminium and manganese phosphate, $(Fe,Mn)Al(OH)_2.PO_4 + 2H_2O$.

650. Eosphorite. Orthorhombic; a hydrous basic manganese, iron and aluminium phosphate, $(Mn,Fe)Al(OH)_2PO_4 + 2H_2O$.

651. Mazapilite. Orthorhombic; a hydrous basic iron and calcium arsenate, $3CaO.2Fe_2O_3.2As_2O_5.6H_2O$.

652. Calcioferrite. Monoclinic(?); a hydrous basic iron and calcium phosphate, $6CaO.3Fe_2O_3.4P_2O_5.19H_2O$.

653. Borickite. Reniform, massive; hydrous basic iron and calcium phosphate, $Ca_3Fe_2(PO_4)_4.12Fe(OH)_3 + 6H_2O(?)$.

RELATED :—*Richellite.*

654. Liroconite. Monoclinic; a hydrous basic aluminium and copper arsenate, perhaps $18CuO.4Al_2O_3.5As_2O_5.55H_2O$.

655. Chenevixite. Massive; perhaps a hydrous copper and iron arsenate, $2CuO.Fe_2O_3.As_2O_5.3H_2O$.

RELATED :—*Henwoodite.*

656. Chalcosiderite. Triclinic; hydrous copper and ferric iron phosphate, $CuO.3Fe_2O_3.2P_2O_5.8H_2O$.

RELATED :—*Andrewsite.*

657. Goyazite. Tetragonal or hexagonal; hydrous basic calcium and aluminium phosphate, $3CaO.5Al_2O_3.P_2O_5.9H_2O$.

658. Plumbogummite. Hexagonal; a hydrous lead and aluminium phosphate, perhaps $PbO.2Al_2O_3.P_2O_5.9H_2O$.

URANITE GROUP.

659. Torbernite. Tetragonal; hydrous uranium and copper phosphate, $CuO.2UO_3.P_2O_5.8H_2O$.

660. Zeunerite. Tetragonal; hydrous copper and uranium arsenate, $CuO.2UO_3.As_2O_5.8H_2O$.

661. Autunite. Orthorhombic; a hydrous calcium and uranium phosphate, $CaO.2UO_3.P_2O_5.8H_2O$.

662. Uranospinite. Orthorhombic; probably a calcium and uranium arsenate, $CaO.2UO_3.As_2O_5.8H_2O$.

663. Uranocircite. Orthorhombic; hydrous barium and uranium phosphate, $BaO.2UO_3.P_2O_5.8H_2O$.

664. Phosphuranylite. Pulverulent incrustation; hydrous uranium phosphate, $3UO_3.P_2O_5.6H_2O$.

665. Trögerite. Monoclinic; a hydrous uranium arsenate, $3UO_3.As_2O_5.12H_2O$.

RELATED :—*Fritzscheite.*

666. Walpurgite. Triclinic; probably a hydrous basic bismuth and uranium arsenate, $5Bi_2O_3.3UO_3.2As_2O_5.12H_2O$.

667. Rhagite. Crystalline; hydrous bismuth arsenate, perhaps $5Bi_2O_3.2As_2O_5.9H_2O$.

668. Mixite. Acicular; a hydrated basic copper and bismuth arsenate, perhaps $20CuO.Bi_2O_3.5As_2O_5.22H_2O$.

ANTIMONATES; ALSO ANTIMONITES, ARSENITES.

669. Atopite. Isometric; perhaps calcium pyroantimonate, $2CaO.Sb_2O_5$.

RELATED :—*Schneebergite.*

670. Bindheimite. Amorphous; a hydrous lead antimonate.

671. Romeite. Tetragonal; a calcium antimonate, perhaps $CaO.Sb_2O_3$.

672. Nadorite. Orthorhombic; lead chlor-antimonate, $PbSb_2O_4.PbCl_2$.

673. Ecdemite. Tetragonal; perhaps lead chlor-arsenate, $Pb_4As_2O_7.2PbCl_2$.

674. Ochrolite. Orthorhombic; probably lead chlor-antimonate, $Pb_4Sb_2O_7.2PbCl_2$.

675. Trippkeite. Tetragonal; essentially a copper arsenate, $(nCuO,As_2O_3)$.

ANTIMONATES OR ANTIMONITES OF DOUBTFUL CHARACTER:

Ammiolite, *Barcenite,* *Taznite.*
Arequipite, *Coronguite,*

PHOSPHATES OR ARSENATES WITH CARBONATES, SULPHATES, BORATES.

676. Dahllite. Fibrous crusts; hydrous calcium phosphate and carbonate, $2Ca_3P_2O_8.CaCO_3.\frac{1}{2}H_2O$.

RELATED :—*Ciplyte.*

677. **Diadochite.** Monoclinic; perhaps a hydrous iron sulpho-phosphate, $2Fe_2O_3.2SO_3.P_2O_5.12H_2O$.
VARIETIES:—1. *Ordinary*, 2. *Destinezite.*
678. **Pittieite.** Reniform and massive; a hydrous ferric iron arsenate and sulphate.
679. **Svanbergite.** Rhombohedral; a hydrous aluminium and calcium phosphate and sulphate.
680. **Beudantite.** Rhombohedral; a lead and ferric iron phosphate or arsenate and sulphate.
681. **Lindackerite.** Orthorhombic; perhaps a hydrous nickel and copper sulphate and arsenate, $3NiO.6CuO.SO_3.2As_2O_5.7H_2O$.
682. **Lüneburgite.** Flattened masses; hydrous magnesium borate and phosphate, $3MgO.B_2O_3.P_2O_5.8H_2O$.

APPENDIX TO PHOSPHATES, ARSENATES, ETC.

Miriquidite, *Arsenate of nickel* (crystalline), *Arsenate of nickel* (amorphous).

NITRATES.

683. **Soda Niter.** Rhombohedral; sodium nitrate, $NaNO_3$.
684. **Niter.** Orthorhombic; potassium nitrate, KNO_3.
685. **Nitrocalcite.** Efflorescent tufts; hydrous calcium nitrate, $Ca(NO_3)_2+nH_2O$.
686. **Nitromagnesite.** Efflorescences; hyd. magnesium nitrate, $Mg(NO_3)_2+nH_2O$.
687. **Nitrobarite.** Isometric; barium nitrate, $Ba(NO_3)_2$.
688. **Gerhardtite.** Orthorhombic; basic copper nitrate, $4CuO.N_2O_5.3H_2O$.
689. **Darapskite.** Tetragonal; hydrous sodium sulphate and nitrate, $NaNO_3.Na_2SO_4+H_2O$.
690. **Nitroglauberite.** Fibrous crystalline; hydrous sodium nitrate and sulphate, $6NaNO_3.2Na_2SO_4.3H_2O$.

5. Borates.

691. **Nordenskiöldine.** Rhombohedral; calcium and tin borate, $CaO.SnO_2.B_2O_3$.
692. **Jeremejevite.** Hexagonal; aluminium borate, $Al_2O_3.B_2O_3$.
693. **Sussexite.** Orthorhombic (?); a manganese, zinc and magnesium borate, $2(Mn,Zn,Mg)O.B_2O_3.H_2O$.
694. **Ludwigite.** Orthorhombic; a magnesium borate with ferrous and ferric iron oxides, perhaps $3MgO.B_2O_3+FeO.Fe_2O_3$.
ALTERS TO:—Limonite.
695. **Pinakiolite.** Orthorhombic; a magnesium and manganese borate, $3MgO.B_2O_3+MnO.Mn_2O_3$.
696. **Hambergite.** Orthorhombic; a basic beryllium borate, $4BeO.B_2O_3.H_2O$.
697. **Szaibelyite.** Acicular; a hydrous magnesium borate, $5MgO.2B_2O_3.1\frac{1}{2}H_2O$.
698. **Boracite.** Isometric externally, orthorhombic molecularly; magnesium chloroborate, $6MgO.MgCl_2.8B_2O_3$.
VARIETIES:—1. *Crystals*, 2. *Massive.*
699. **Rhodizite.** Isometric; aluminium and potassium borate chiefly, $(K,Rb,Cs)_2O.2Al_2O_3.3B_2O_3$.
700. **Warwickite.** Orthorhombic; a magnesium, iron and titanium borate, perhaps $6MgO.FeO.2TiO_2.3B_2O_3$.
701. **Howlite.** Orthorhombic (?); a calcium silicoborate, $4CaO.5B_2O_3.2SiO_2.5H_2O$.
RELATED:—*Winkworthite.*
702. **Lagonite.** Incrusting; a hydrous ferric iron borate, $Fe_2O_3.3B_2O_3.3H_2O$.
703. **Larderellite.** Monoc.; a hydrous ammonium borate, $(NH_4)_2O.4B_2O_3.4H_2O$.
704. **Colemanite.** Monoclinic; a hydrous calcium borate, $2CaO.3B_2O_3.5H_2O$.
RELATED:—*Priceite*, *Pandermite.*
705. **Pinnoite.** Tetragonal; a hydrous magnesium borate, $MgO.B_2O_3.3H_2O$.
RELATED:—*Kaliborite.*
706. **Heintzite.** Monoclinic; a hydrous magnesium and potassium borate, $K_2Mg_4B_{12}O_{32}.16H_2O$ (?).
707. **Borax.** Monoclinic; a hydrous sodium borate, $Na_2O.2B_2O_3.10H_2O$.
RELATED—*Tincalconite.*

708. Ulexite. Masses of capillary crystals; a hydrous sodium and calcium borate, probably $Na_2O.2CaO.5B_2O_3.16H_2O$.
ALTERS TO :—Gypsum.
RELATED :—*Franklandite, Cryptomorphite.*

709. Bechilite. Crusts; a hydrous calcium borate, $CaO.2B_2O_3.4H_2O$.
RELATED :—*Hayesine.*

710. Hydroboracite. Monoclinic(?); hydrous calcium and magnesium borate, $CaO.MgO.3B_2O_3.6H_2O$.

URANATES.

711. Uraninite. Isometric; uranate of uranyl, lead, generally thorium, often lanthanum and yttrium metals.

VARIETIES :—

1. *Crystallized,*
   (a) *Uranniobite,*
   (b) *Bröggerite,*
   (c) *Cleveite,*
   (d) *Nivenite,*
2. *Massive (Pitchblende).*

ALTERS TO :—Gummite, Uranophane.
RELATED :—*Coracite.*

712. Gummite. Massive; alteration of uraninite, perhaps $(PbCa)U_3SiO_{12}.6H_2O$.
RELATED :—*Yttrogummite, Thorogummite, Chlorothorite.*

713. Uranosphærite. Globular; a hydrous bismuth uranate, $Bi_2O_3.2UO_3.3H_2O$.

6. Sulphates, Chromates, Tellurates.

A. ANHYDROUS SULPHATES, ETC.

714. Mascagnite. Orthorhombic; ammonium sulphate, $(NH_4)_2SO_4$.

715. Taylorite. Crystalline; potassium and ammonium sulphate, $5K_2SO_4.(NH_4)_2SO_4$.

716. Thenardite. Orthorhombic; sodium sulphate, Na_2SO_4.
RELATED :—*Dihydro-thenardite.*

717. Aphthitalite. Rhombohedral; potassium and sodium sulphate, $(K,Na)_2SO_4$.
RELATED :—*Arcanite.*

718. Glauberite. Monoclinic; sodium and calcium sulphate, $Na_2SO_4.CaSO_4$.

BARITE GROUP. Orthorhombic.

719. Barite. Orthorhombic; barium sulphate, $BaSO_4$.

VARIETIES :—

1. *Ordinary :—*
   (a) *Crystals,*
   (b) *Crested,*
   (c) *Columnar,*
   (d) *Globular (Bologna Stone),*
   (e) *Lamellar,*
   (f) *Granular,*
   (g) *Compact,*
   (h) *Earthy,*
   (i) *Stalactitic,*
2. *Fetid,*
3. *Allomorphite,*
4. *Calcareobarite,*
5. *Celestobarite,*
6. *Calstronbarite,*
7. *Schoarite.*

ALTERS TO :—Calcite, Siderite, Cerussite, Quartz, Limonite, Hematite, Pyrite, Psilomelane, Göthite.
RELATED :—*Leedsite, Dreelite, Eggonite.*

720. Celestite. Orthorhombic; strontium sulphate, $SrSO_4$.

VARIETIES :—

1. *Ordinary :—*
   (a) *Crystals,*
   (b) *Fibrous,*
   (c) *Lamellar,*
   (d) *Granular,*
   (e) *Concretionary.*
   (f) *Earthy,*
2. *Calciocelestite,*
3. *Barytocelestite.*

721. Anglesite. Orthorhombic; lead sulphate, $PbSO_4$.
ALTERS TO :—Cerussite, Mimetite (?), Hydrous Anglesite.

722. Anhydrite. Orthorhombic; anhydrous calcium sulphate, $CaSO_4$.

VARIETIES :—

1. *Ordinary :—*
   (a) *Crystallized,*
   (b) *Fibrous,*
   (c) *Fine granular,*
   (d) *Scaly granular (Vulpinite).*
2. *Pseudomorphous; in cubes after rock-salt.*

723. Zinkosite. Orthorhombic; anhydrous zinc sulphate, $ZnSO_4$.
724. Hydrocyanite. Orthorhombic; cupric sulphate, $CuSO_4$.
725. Crocoite. Monoclinic; lead chromate, $PbCrO_4$.
726. Phœnicochroite. Orthorhombic(?); basic lead chromate, $3PbO.2CrO_3$.
727. Vauquelinite. Monoclinic; a lead phospho-chromate, perhaps $2(Pb,Cu)CrO_4.(Pb,Cu)_3P_2O_8$.
RELATED :—*Jossaite, Tarapacaite, Calcium chromates, Sulphates of mercury.*

SULPHATES WITH CHLORIDES, CARBONATES, ETC.—IN PART HYDROUS.

728. Sulphohalite. Isometric; sodium sulphate and chloride, $3Na_2SO_4.2NaCl$.
729. Caracolite. Orthorhombic(?); perhaps a basic lead chloride and sodium sulphate, $Pb(OH)Cl.Na_2SO_4$.
RELATED :—*Chlorothionite.*
730. Kainite. Monoclinic; a hydrous magnesium and potassium chlor-sulphate, $MgSO_4.KCl+3H_2O$.
731. Connellite. Hexagonal; a hydrous basic copper chlor-sulphate, probably $Cu_{15}(Cl,OH)_4SO_{16}.15H_2O$.
732. Spangolite. Rhombohedral; a basic aluminium and copper chlor-sulphate, $(AlCl)SO_4.6Cu(OH)_2+3H_2O$.
733. Hanksite. Hexagonal; sodium sulphato-carbonate, $4Na_2SO_4.Na_2CO_3$.
734. Leadhillite. Monoclinic; a lead sulphato-carbonate, $4PbO.SO_3.2CO_2.H_2O$.(?).
RELATED :—*Susannite.*

B. ACID AND BASIC SULPHATES.

735. Misenite. Fibers; acid potassium sulphate(?), $KHSO_4$.
736. Alumian. Rhombohedral(?); an aluminium sulphate, $Al(AlO)(SO_4)_2$(?).
737. Lanarkite. Monoclinic; basic lead sulphate, $PbSO_4.PbO$.
738. Dolerophanite. Monoclinic; a basic cupric sulphate, probably $2CuO.SO_3$.
739. Caledonite. Orthorhombic; basic lead and copper sulphate, perhaps $2(Pb,Cu)O.SO_3.H_2O$.
740. Brochantite. Orthorhombic; basic copper sulphate, $4CuO.SO_3.3H_2O$.
VARIETIES :—1. *Ordinary crystals; 2. Waringtonite.*
741. Linarite. Monclinic; basic lead and copper sulphate, $PbO.CuO.SO_3.H_2O$.
RELATED :—*Antlerite.*

C. HYDROUS SULPHATES.—NORMAL DIVISION.

742. Lecontite. Orthorhombic; hydrous sodium, ammonium and potassium sulphate, $(Na,NH_4,K)_2SO_4+2H_2O$.
RELATED:—*Guanovulite.*
743. Mirabilite. Monoclinic; hydrous sodium sulphate, $Na_2SO_4+10H_2O$.
RELATED :—*Exanthalose.*
744. Kieserite. Monoclinic; hydrous magnesium sulphate, $MgSO_4+H_2O$.
RELATED :—*Abraum salts.*
745. Szmikite. Amorphous; hydrous manganese sulphate, $MnSO_4+H_2O$.
746. Gypsum. Monoclinic; hydrous calcium sulphate, $CaSO_4+2H_2O$.

VARIETIES :—

1. *Crystallized* (*Selenite*),
2. *Fibrous* (*a*) *Satin spar*, (b) *Plumose*,
3. *Massive* (a) *Alabaster*, (b) *Scaly-granular*, (c) *Rock-gypsum.*

ALTERS TO :—Calcite, Malachite, Quartz, Anhydrite.
747. Ilesite. Monoclinic (?); a hydrous manganese, zinc and iron sulphate, $(Mn,Zn,Fe)SO_4+4H_2O$.
748. Epsomite. Orthorhombic; hydrous magnesium sulphate, $MgSO_4+7H_2O$.
RELATED :—*Tauriscite.*
749. Goslarite. Orthorhombic; hydrous zinc sulphate, $ZnSO_4+7H_2O$.
750. Morenosite. Orthorhombic; hydrous nickel sulphate, $NiSO_4+7H_2O$.
RELATED :—*Tecticite, Fauserite.*

MELANTERITE OR COPPERAS GROUP. Monoclinic.

751. Melanterite. Monoclinic; hydrous ferrous sulphate, $FeSO_4+7H_2O$.
RELATED :—*Bourbolite.*

752. Mallardite. Monoclinic; hydrous manganese sulphate, $MnSO_4+7H_2O$.

753. Pisanite. Monoclinic; hydrous iron and copper sulphate, $(Fe,Cu)SO_4+7H_2O$.

754. Bieberite. Monoclinic; hydrous cobalt sulphate, $CoSO_4+7H_2O$.
RELATED :—*Cupromagnesite.*

755. Chalcanthite. Triclinic; hydrous cupric sulphate, $CuSO_4+5H_2O$.

756. Syngenite. Monoclinic; hydrous calcium and potassium sulphate, $CaSO_4.K_2SO_4+H_2O$.

757. Löweite. Tetragonal; hydrous magnesium and sodium sulphate, $MgSO_4.Na_2SO_4+2\frac{1}{2}H_2O$.

758. Blödite. Monoclinic; hydrous magnesium and sodium sulphate, $MgSO_4.Na_2SO_4+4H_2O$.
VARIETIES :—1. *Ordinary*, 2. *Astrakanite.*

759. Boussingaultite. Monoclinic; a hydrous ammonium and magnesium sulphate, $(NH_4)_2SO_4.MgSO_4+6H_2O$.

760. Picromerite. Monoclinic; hydrous magnesium and potassium sulphate, $MgSO_4.K_2SO_4+6H_2O$.

761. Cyanochroite. Monoclinic; hydrous copper and potassium sulphate, $CuSO_4.K_2SO_4+6H_2O$.

762. Polyhalite. Monoclinic (?); hydrous calcium, magnesium and potassium sulphate, $2CaSO_4.MgSO_4.K_2SO_4+2H_2O$.
RELATED :—*Krugite, Mamanite.*

763. Wattevillite. Orthorhombic or monoclinic; a hydrous calcium and sodium sulphate, $CaSO_4.Na_2SO_4+4H_2O$.

ALUM AND HALOTRICHITE GROUPS.

764. Kalinite. Isometric; hydrous aluminium and potassium sulphate, $K_2SO_4.Al_2(SO_4)_3+24H_2O$.

765. Tschermigite. Isometric; hydrous aluminium and ammonium sulphate, $(NH_4)_2SO_4.Al_2(SO_4)_3+24H_2O$.

766. Mendozite. Fibrous; hydrous aluminium and sodium sulphate, $Na_2SO_4.Al_2(SO_4)_3+24H_2O$.

767. Tamarugite. Fibrous; hydrous aluminium and sodium sulphate, $Na_2SO_4.Al_2(SO_4)_3+12H_2O$.

768. Pickeringite. Monoclinic(?); hydrous aluminium and magnesium sulphate, $MgSO_4.Al_2(SO_4)_3+22H_2O$.
RELATED :—*Stüvenite, Sonomaite, Picroalumogene, Dumreicherite, Aromite.*

769. Halotrichite. Monoclinic or triclinic; hydrous iron and aluminium sulphate, $FeSO_4.Al_2(SO_4)_3+24H_2O$.

770. Apjohnite. Monoclinic(?); hydrous aluminium and manganese sulphate, $MnSO_4.Al_2(SO_4)_3+24H_2O$.
VARIETIES :—1. *Ordinary*, 2. *Bushmanite.*

771. Dietrichite. Monoclinic(?); hydrous zinc, iron, manganese and aluminium sulphate, $(Zn,Fe,Mn)SO_4.Al_2(SO_4)_3+22H_2O$.

772. Coquimbite. Rhomb.; a hydrous ferric iron sulphate, $Fe_2(SO_4)_3+9H_2O$.

773. Quenstedtite. Monoc.; a hydrous ferric iron sulphate, $Fe_2O_3.3SO_3.10H_2O$.

774. Ihleïte. Efflorescence; hydrous ferric iron sulphate, $Fe_2(SO_4)_3+12H_2O$.
RELATED :—*Kornelite.*

775. Alunogen. Monoclinic; hydrous aluminium sulphate, $Al_2(SO_4)_3+18H_2O$.

776. Krohnkite. Monoclinic; hydrous copper and sodium sulphate, $CuSO_4.Na_2SO_4+2H_2O$.
RELATED :—*Phillipite.*

777. Ferronatrite. Rhombohedral; hydrous iron and sodium sulphate, $3Na_2O.Fe_2O_3.6SO_3.6H_2O$.

778. Römerite. Triclinic; hydrous ferrous and ferric iron sulphate, perhaps $FeSO_4.Fe_2(SO_4)_3+12H_2O$.

C. HYDROUS SULPHATES.—BASIC DIVISION.

779. Langite. Orthorhombic; hydrous basic copper sulphate, $4CuO.SO_3.4H_2O$.
RELATED :—*Woodwardite.*

780. **Herrengrundite.** Monoclinic; hydrous basic copper and calcium sulphate, $CaO.4CuO.2SO_3.6H_2O$.

780A. **Arnimite.** Acicular; a hydrous basic copper sulphate, $5CuO.2SO_3.6H_2O$.

781. **Cyanotrichite (Lettsomite).** Orthorhombic; a hydrous basic copper and aluminium sulphate, $4CuO.Al_2O_3.SO_3.8H_2O$.

782. **Serpierite.** Orthorhombic; a basic copper and zinc sulphate.

783. **Castanite.** Monoclinic; hydrous basic ferric iron sulphate, $Fe_2O_3.2SO_3.8H_2O$.
RELATED:—*Rubrite.*

784. **Copiapite.** Monoclinic; a hydrous basic ferric iron sulphate, perhaps $2Fe_2O_3.5SO_3.18H_2O$.

785. **Knoxvillite.** Orthorhombic (?); a hydrous basic chromium, iron and aluminium sulphate, $3([Fe.Mg]O).4([Fe,Cr,Al]_2O_3).9SO_3.30H_2O$(?).
RELATED:—*Redingtonite.*

786. **Utahite.** Rhomb.; a hydrous basic ferric iron sulphate, $3Fe_2O_3.3SO_3.4H_2O$.

787. **Amarantite.** Tric.; a hydrous basic ferric iron sulphate, $Fe_2O_3.2SO_3.7H_2O$.
RELATED:—*Hohmannite, Paposite, Ferric sulphates.*

788. **Fibroferrite.** Monoclinic(?); a hydrous basic ferric iron sulphate, $Fe_2O_3.2SO_3.10H_2O$.

789. **Raimondite.** Hexagonal or rhombohedral; a hydrous basic ferric iron sulphate, $2Fe_2O_3.3SO_3.7H_2O$.
RELATED:—*Pastreite, Apatelite.*

790. **Carphosiderite.** Rhombohedral(?); a hydrous basic ferric iron sulphate, perhaps $3Fe_2O_3.4SO_3.10H_2O$.

791. **Aluminite.** Monoclinic; a hydrous aluminium sulphate, $Al_2O_3.SO_3.9H_2O$.
RELATED:—*Werthemanite, Winebergite.*

792. **Glockerite.** Massive; a hydrous basic ferric iron sulphate, $2Fe_2O_3.SO_3.6H_2O$.

793. **Felsöbanyite.** Orthorhombic; a hydrous basic aluminium sulphate, $2Al_2O_3.SO_3.10H_2O$.

794. **Paraluminite.** Massive; a hydrous basic aluminium sulphate, $2Al_2O_3.SO_3.15H_2O$(?).
RELATED:—*Pissophanite.*

795. **Cyprusite.** Hexagonal(?); a hydrous ferric iron and aluminium sulphate, perhaps $7Fe_2O_3.Al_2O_3.10SO_3.14H_2O$.
RELATED:—*Erusibite.*

796. **Voltaite.** Isometric(?); a hydrous iron, magnesium and aluminium sulphate, $(^{II}Fe,Mg)_5(^{III}Fe,Al,)_4S_{10}O_{41}.15H_2O$(?).
RELATED:—*Pettkoite.*

797. **Metavoltine.** Hexagonal; a hydrous sodium, potassium and iron sulphate, perhaps $5(K_2,Na_2,Fe)O.3Fe_2O_3.12SO_3.18H_2O$.

798. **Botryogen.** Monoclinic; a hydrous magnesium, ferrous and ferric iron sulphate, perhaps $MgO.FeO.Fe_2O_3.4SO_3.18H_2O$.

799. **Sideronatrite.** Orthorhombic; a hydrous sodium and ferric iron sulphate, $2Na_2O.Fe_2O_3.4SO_3.7H_2O$.

800. **Alunite.** Rhombohedral; hydrous aluminium and potassium sulphate, $K_2O.3Al_2O_3.4SO_3.6H_2O$.

801. **Jarosite.** Rhombohedral; hydrous potassium and ferric iron sulphate, $K_2O.Fe_2O_3.4SO_3.6H_2O$.
VARIETIES:—1. *Crystallized*, 2. *Concretionary.*
RELATED:—*Bartholomite, Plagiocitrite, Clinophæite, Clinocrocite.*

802. **Löwigite.** Rounded masses; hydrous potassium and aluminium sulphate, perhaps $K_2O.3Al_2O_3.4SO_3.9H_2O$.
RELATED:—*Ignatievite.*

803. **Ettringite.** Hexagonal; hydrous calcium and aluminium sulphate, perhaps $6CaO.Al_2O_3.3SO_3.33H_2O$.

804. **Quetenite.** Monoclinic or triclinic (?); a hydrous magnesium and iron sulphate, $MgO.Fe_2O_3.3SO_3.13H_2O$.

805. **Zincaluminite.** Hexagonal (?); a hydrous basic zinc and aluminium sulphate. $6ZnO.3Al_2O_3.2SO_3.18H_2O$.
RELATED:—*Enysite, Lamprophanite.*

806. **Johannite.** Monoclinic; a hydrous uranium and copper sulphate.

807. **Uranopilite.** Incrustation of minute crystals; a hydrous basic calcium and uranium sulphate, perhaps $CaO.8UO_3.2SO_3.25H_2O$.
RELATED:—*Medjidite, Uranochalcite, Zippeite, Voglianite, Uraconite.*

TELLURATES; ALSO TELLURITES, SELENITES.

808. Montanite. Incrusting; a hydrous bismuth tellurate, $Bi_2O_3.TeO_3.2H_2O$.
809. Emmonsite. Monoclinic; probably a hydrous ferric iron tellurite.
810. Durdenite. Massive; hydrous ferric iron tellurite, $Fe_2O_3.3TeO_2.4H_2O$.
RELATED :—*Ferrotellurite, Magnolite.*
811. Chalcomenite. Monoclinic; hydrous cupric selenite, $CuO.SeO_2.2H_2O$.
RELATED :—*Molybdomenite, Cobaltomenite, Kerstenite, Onofrite.*

7. Tungstates, Molybdates.

812. Wolframite. Monoclinic; an iron and manganese tungstate, $(Fe,Mn)WO_4$.
ALTERS TO :—Scheelite.
RELATED :—*Ferberite.*
813. Hübnerite. Monoclinic; a manganese tungstate, $MnWO_4$.

SCHEELITE GROUP. Tetragonal.

814. Scheelite. Tetragonal; calcium tungstate, $CaWO_4$.
ALTERS TO :—Wolframite, Kaolinite.
815. Cuprotungstite. Granular and crusts; copper tungstate, $CuWO_4$; also copper and calcium tungstate, $(Ca,Cu)WO_4$.
816. Powellite. Tetragonal; essentially calcium molybdate, $CaMoO_4$.
817. Stolzite. Tetragonal; lead tungstate, $PbWO_4$.
818. Wulfenite. Tetragonal; lead molybdate, $PbMoO_4$.
819. Reinite. Tetragonal; iron tungstate, $FeWO_4$.
RELATED :—*Pateraite, Eosite, Achrematite.*
820. Belonesite. Tetragonal; probably magnesium molybdate, $MgMoO_4$.

VII. SALTS OF ORGANIC ACIDS.

OXALATES, MELLATES.

821. Whewellite. Monoclinic; calcium oxalate, $CaC_2O_4+H_2O$.
RELATED :—*Thierschite.*
822. Oxammite. Orthorhombic; ammonium oxalate, $(NH_4)_2C_2O_4+2H_2O$.
823. Humboldtine. Capillary; hydrous ferrous iron oxalate, $2FeC_2O_4+3H_2O$.
RELATED :—*Oxalate of sodium and ammonium.*
824. Mellite. Tetragonal; hydrous aluminium mellate, $Al_2C_{12}O_{12}+{}_{18}H_2O$.
RELATED :—*Pigotite, Organic salts of iron.*

VIII. HYDROCARBON COMPOUNDS.

The Hydrocarbon compounds in general, with perhaps a few exceptions, are not homogeneous substances, but mixtures, which by the action of solvents or by fractional distillation may be separated into two or more component parts.

1. SIMPLE HYDROCARBONS.

Chiefly members of the Paraffin Series CnH_2n+_2.

Scheererite. Monoclinic; carbon 73%, hydrogen 24%, probably a polymer of marsh gas.
Hatchettite. Massive; carbon 85.55%, hydrogen 14.45%.
RELATED :—*Paraffin, Chrismatite.*
Ozocerite. Waxy; chiefly a higher paraffin, carbon 84.43%, hydrogen 13.69%.
RELATED :—*Zietrisikite, Urpethite, Baikerinite, Neft-gil, Pyropissite, Helenite.*
Fichtelite. Monoclinic; formula doubtful, $C_{15}H_{26}$ to $C_{15}H_{28}$.

Hartite. Triclinic or monoclinic; ratio of C to H=12 : 20.
RELATED :—*Dinite, Ixolyte, Napalite.*

Könlite. Amorphous; ratio of C to H = 1 : 1, a polymer of benzene.
RELATED :—*Phylloretin, Naphthalene.*

2. OXYGENATED HYDROCARBONS.

Comprise chiefly the numerous kinds of native fossil resins often designated by the general term "Ambers."

Succinite (True Amber). Irregular masses; ratio of C,H,O = 40 : 64 : 4.
RELATED :—*Succinellite.*

Retinite. A generic name, under which are included the following amber-like resins. They contain little or no succinic acid.

Gedanite,	*Duxite,*	*Bucaramangite,*
Glessite,	*Muckite,*	*Rosthornite,*
Rumänite,	*Neudorfite,*	*Copalite,*
Simetite,	*Schraufite,*	*Ambrosine,*
Krantzite,	*Jaulingite,*	*Ajkite,*
Siegburgite,	*Refikite,*	*Wheelerite,*
Walchowite,	*Köflachite,*	*Ionite,*
Chemawinite,	*Ambrite,*	*Euosmite.*

Bathvillite. Amorphous; ratio of C,H,O = 40 : 68 : 4.

RELATED :—

Torbanite,	*Xyloretinite,*	*Guyaquillite,*
Retinellite,	*Scleretinite,*	*Middletonite.*

Tasmanite. Resiniferous shale; carbon 79.34 %, hydrogen 10.41 %, oxygen 4.93 %, sulphur 5.32 %.
RELATED :—*Trinkerite.*

Dysodile. Thin leaves; carbon 69 %, hydrogen 10 %, oxygen 16.9 %, sulphur 2.35 %, nitrogen 1.7 %.

Pyroretinite. Resin-like; carbon 80 %, hydrogen 9.33 %, oxygen 10.67 %.
RELATED :—*Stanekite, Reussinite.*

Leucopetrite. Between resin and wax in characters; $C_{50}H_{84}O_3$.
RELATED :—*Brücknerellite, Anthracoxenite.*

Geomyricite. Wax-like; $C_{34}H_{68}O_2$.

Geocerite. Wax-like; $C_{28}H_{56}O_2$.
RELATED :—*Geocerellite.*

Bombiccite. Triclinic; C_7HO_{13}.
RELATED :—*Hofmannite.*

Idrialite. Crystalline when pure; $C_{80}H_{56}O_2$.
RELATED :—*Aragotite, Posepnyte.*

Rochlederite. Resin-like; carbon 76.79 %, hydrogen 9.06 %, oxygen 14.15 %.
RELATED :—*Native humus acid, Hircite.*

Dopplerite. Amorphous; $C_{12}H_{14}O_6$.
RELATED :—*Phytocollite.*

APPENDIX TO HYDROCARBONS.

Petroleum. Liquid; chiefly consists of members of the paraffin series, CnH_{2n+2}.
RELATED :—*Naphtha, Pittasphalt, Petrolene.*

Asphaltum. Amorphous; composition variable.

Elaterite. Massive; about 85 % carbon, 12-13 % hydrogen.
RELATED :—*Settling stones resin, Berengelite, Bielzite, Piauzite, Wurtzilite, Albertite, Cloustonite, Grahamite, Uintahite.*

Mineral Coal. Compact massive; mainly oxygenated hydrocarbons.
1. *Anthracite.*
2. *Bituminous;—*
   (a) *Caking or coking coal,*
   (b) *Non-caking coal,*
   (c) *Cannel coal,*
   (d) *Brown coal.*

RELATED :—*Byerite, Huminite, Anthraxolite, Wollongongite.*

Complete Supplement
to
Dana's Classification.

NEW MINERALS

The following list includes new minerals described in the Supplement and in Appendix I. of Dana's *System of Mineralogy* (6th ed.)

The relative importance of the new names is approximately indicated by the type used.

Adelite. Massive; a basic calcium and magnesium arsenate, $H_2O.2CaO.2MgO.As_2O_5$.

Aguilarite. Isometric; silver sulpho-selenide, $Ag_2S.Ag_2Se$.

Alexandrolite. Amorphous; contains $H_2O, Al_2O_3, SiO_2, Cr_2O_3$.

Andorite. Orthorhombic; sulphantimonite of lead and silver. $2PbS.Ag_2S.3Sb_2S_3$.

Ascharite. Massive; a hydrous magnesium borate.

Astochite. Monoclinic; basic potassium, sodium, calcium, magnesium and manganese silicate, $(Mg,Mn,Ca)SiO_3+(Na,K,H)_2Si_3$, (amphibole).

Baddeckite. Scaly; a ferruginous muscovite. Silicate of aluminium, iron, etc.

Baddeleyite. Monoclinic (?); zirconium dioxide, ZrO_2.

Barracanite. Cupropyrite, $CuFe_2S_4$. Near Cubanite.

Batavite. Scales; silicate of magnesium, aluminium, etc.

Beaconite. A fibrous talc. Pseudomorphous (?); $H_2(Mg,Fe)_3(SiO_4)_3$.

Beresovite. Crystalline; chromate and carbonate of lead, $6PbO.3CrO_3.CO_2$.

Bismutosmaltite. Isometric; a skutterudite containing bismuth, $Co(As,Bi)_3$.

Bixbyite. Isometric; mainly iron and manganese oxide, $FeO.MnO_2$.

Bliabergite. Orthorhombic; hydrous iron, aluminium and manganese silicate.

Boléite. Isometric; a hydrous lead and copper oxychloride with some silver chloride, $Pb,CuCl_2(OH)_2+\frac{1}{3}AgCl$.

Canfieldite. Isometric; sulphide of silver, tin and germanium, $4Ag_2S.(SnGe)S_2$.

Carnotite. A crystalline powder containing uranium and vanadium, $K_2O.2U_2O_3.V_2O_5.3H_2O$. (?).

Cataphorite. An alkali-iron amphibole, between Arfvedsonite and Barkevikite.

Celsian. Triclinic; barium feldspar, near Anorthite, $BaO.Al_2O_3.2SiO_2$.

Clinohedrite. Monoclinic-clinohedral; a basic calcium zinc silicate, $(ZnOH)(CaOH)SiO_3$.

Clinozoisite. Monoclinic; near Zoisite in composition.

Cosmochlore. Monoclinic (?); a chromium silicate. (Meteoric).

Crossite. An aluminium, iron, magnesium and sodium silicate.

Cubeite. Monoclinic (?); an iron sulphate containing SO_3, Fe_2O_3, MgO, H_2O.

Cumengite. Tetragonal; hydrous lead and copper oxychloride, $PbCl_2.CuO.H_2O$.

Cuprocassiterite. Supposed new tin mineral.

Cuproiodargyrite. Incrusting; a copper and silver iodide, CuI.AgI.

Cylindrite. Massive; a lead sulphantimonate and sulpho-stannate, $3PbS.Sb_2S_3+3(PbS.2SnS_2)$.

Derbylite. Orthorhombic; an antimono-titanate of iron, perhaps $6FeO.5TiO_2.Sb_2O_5$.

Dietzeite. Monoclinic; a calcium iodate and chromate, $7Ca(IO_3)_2.8CaCrO_4$.

Elpidite. Hydrous zirconium and sodium silicate, $Na_2O.ZrO_2.6SiO_2.3H_2O$.

Epididymite. Monoclinic; a basic sodium and beryllium silicate, $H_2O.Na_2O.2BeO.6SiO_2$.

Erionite. Orthorhombic; an impure hydrous aluminium silicate, $CaO.K_2O.Na_2O.Al_2O_3.6SiO_2.6H_2O$.

Falkenhaynite. Massive; a copper sulphantimonite (?), $3Cu_2S.Sb_2S_3$.

Fedorovite. Between Aegirite-Augite and Aegirite.

Footeite. Monoclinic; a hydrous basic copper chloride, perhaps $8Cu(OH)_2.CuCl_2+4H_2O$.

Fouquéite. Monoclinic; a basic aluminium, calcium and iron ortho-silicate (essentially an epidote, with but little iron).

Franckeite. Fibrous; a sulphostannite of lead and antimony, $5PbS.Sb_2S_3.2Sn_2$.

Fuggerite. Calcium and aluminium sulphate (?).

Geikielite. Magnesium titanate, $MgO.TiO_2$.

Glaucochroite. Orthorhombic; a calcium manganese silicate, $CaMnSiO_4$.

Goldschmidtite. Monoclinic; a gold and silver telluride, Au_2AgTe_6.

Gonnardite. Orthorhombic (?); a hydrous aluminium silicate, $(Ca,Na_2)_2Al_2Si_3O_{12}+5\frac{1}{2}H_2O$.

Grunlingite. Rhombohedral (?), bismuth sulphide and telluride, Bi_4TeS_3.

Hainite. Triclinic; a silicate of sodium, calcium, titanium and zirconium.

Hancockite. Monoclinic; a silicate of aluminium, ferric iron, lead, calcium and strontium.

Hardystonite. Tetragonal; a silicate of calcium and zinc, $2CaO.ZnO.2SiO_2$.

Hastingsite. An amphibole with composition of an orthosilicate, analogous to garnet.

Hauchecornite. Tetragonal; essentially nickel, bismuth, antimony and sulphur. $(Ni,Co)_7.(S,Bi,Sb)_8$.

Hessenbergite. Monoclinic; a silicate, exhaustively described crystallographically, but constituents undetermined.

Hoeferite. Amorphous; a hydrated ferric silicate, $2Fe_2O_3.4SiO_2.7H_2O$. (?).

Hydrobucholzite. A hydrous aluminium silicate with some calcium sulphate.

Hydrocalcite. Needles; a hydrous calcium carbonate, perhaps $CaCO_3+2H_2O$.

Hydrosamarskite. A hydrated "gadolinite-earth" samarskite.

Idrizite. Compact to crystalline; a hydrous iron aluminium silicate, $(Mg,Fe)\text{-}(Fe,Al)_2Si_3O_{12}+16H_2O$.

Josephinite. Massive; an iron-nickel, Fe_2Ni_3.

Kalgoorlite. Massive; a mercury telluride of gold and silver, $HgAu_2Ag_6Te_4$.

Kallilite. Massive; a nickel sulphi-bismuthide, $NiS_2.NiBi_2$.

Kamarezite. Crystalline; a hydrated copper sulphate, $(CuOH)_2SO_4.Cu(OH)_2+6H_2O$ (?).

Karamsinite. Probably calcium, magnesium, potassium, iron, manganese, aluminium and copper silicate.

Kehoeite. Amorphous; a hydrous zinc and aluminium phosphate, $ZnO.4Al_2O_3.5P_2O_5.9H_2O$.

Knopite. Isometric (?); near perofskite, but contains cerium.

Ktypeite. Calcium carbonate in form of pisolites.

Lamprophyllite. Flattened prisms; contains silica, titanium, iron, manganese and sodium. Related to astrophyllite.

Langbeinite. Isometric-tetartohedral; a magnesium and potassium sulphate, $K_2SO_4.2MgSO_4$.

Lautarite. Monoclinic; calcium iodate, $Ca(IO_3)_2$.

Lawsonite. Orthorhombic; a basic calcium and aluminium silicate, $H_4CaAl_2Si_2O_{10}$.

Lembergite. Artificial; silicate of aluminium and sodium, $5Na_2Al_2Si_2O_8+4H_2O$.

Leonite. Monoclinic; hydrous magnesium and potassium sulphate, $MgSO_4.K_2SO_4+4H_2O$.

Lewisite. Isometric; a calcium and iron titano-antimonate, $5CaO.3Sb_2O_5.2TiO_2$ (?).

Lorandite. Monoclinic; a thallium sulpharsenide, $Tl_2S.As_2S_3$.

Lossenite. Pyramids; contains lead sulphate, iron, arsenic and water, $2PbSO_4.3(FeOH)_3As_2O_8+12H_2O$ (?).

Lutecite. See Quartzine.

Mackintoshite. Tetragonal; mainly oxides of silicon, uranium, thorium and water, $UO_2.3ThO_2.3SiO_2.3H_2O$.

Manganandalusite. An andalusite, containing Mn_2O_3.

Manganberzeliite. A name given to pyrrharsenite, a variety of Berzeliite.

Manganoferrite. An iron and manganese oxide $(FeMn)_3O_4$, formed in some furnace slags.

Marshite. Tetragonal; probably copper iodide, Cu_2I_2.

Mauzeliite. Isometric; essentially a calcium titano-antimonate, $4(Ca,Pb)O.TiO_2.2Sb_2O_5$.

Metadesmine. A dehydrated stilbite.

Metanocerine. Near nocerite.

Metascolesite. Scolesite altered by moderate heating.

Miersite. Isometric-tetrahedral; essentially silver iodide, Ag_2I_2.

Minervite. Aluminium phosphate, $Al_2O_3.P_2O_5.7H_2O$.

Mitchellite. A magnesian chromite, $2MgAl_2O_4.MgCr_2O_4.FeCr_2O_4$.

Morinite. Monoclinic; contains sodium, aluminium and phosphoric acid.

Mossite. Tetragonal; tantalo-niobate of iron, $Fe(Nb,Ta)_2O_6$.

Mursinskite. Tetragonal.

Nasonite. Monoclinic (?); massive, essentially a lead silicate, $(Ca,Pb)_{10}Cl_2Si_6O_{21}$.

Neptunite. Monoclinic; sodium and potassium silicate and iron and manganese titanate, $(\frac{3}{4}\,Na_2+\frac{1}{4}\,K_2)Si_4O_9+(\frac{2}{3}\,Fe+\frac{1}{3}\,Mn)TiO_3$(?).

Nickel. An iron-nickel alloy, Ni_3Fe.

Nickel-skutterudite. Granular; a nickel, cobalt and iron tri-arsenide, $(NiCo,Fe)\,As_3$.

Northupite. Isometric; a magnesium and sodium carbonate and sodium chloride, $MgCO_3.Na_2CO_3.NaCl$.

Offrétite. Hexagonal or rhombohedral; hydrous potassium, calcium and aluminium silicate, $(K_2Ca)_2Al_6Si_{14}O_{39}+17H_2O$.

Paralaurionite. Monoclinic; an oxychloride of lead, $PbCl_2.Pb(OH)_2$.

Paramelaconite. Tetragonal; copper oxides, essentially CuO.

Pearceite. Silver sulpharsenite, $9Ag_2S.As_2S_3$.

Penfieldite. Hexagonal; lead oxychloride, $PbO.2PbCl_2$.

Pirssonite. Orthorhombic; a hydrous calcium and sodium carbonate, $CaCO_3.Na_2CO_3.2H_2O$.

Planoferrite. Orthorhombic (?); an iron sulphate, $Fe_2O_3.SO_3.15H_2O$.

Prolectite. Monoclinic; a magnesium silicate, propably $Mg[Mg(F,OH)]SiO_4$.

Pseudopyrophyllite. Orthorhombic; $3MgO.4Al_2O_3.9SiO_2.8H_2O$. Related to pyrophyllite.

Pyrophanite. Rhombohedral; a manganese titanate, $MnTiO_3$.

Quartzine. Anhydrous fibrous silica.

Raspite. Monoclinic; a lead tungstate, $PbWO_4$.

Rathite. Orthorhombic; contains lead, sulphur, arsenic and antimony.

Retzian. Orthorhombic; a basic arsenate of manganese, calcium and undetermined rare metals.

Rhodolite. Variety of garnet.

Rhodusite. Fibrous; a glaucophane, with Fe_2O_3 replacing Al_2O_3.

Roeblingite. Masses of prismatic crystals; a hydrous calcium and lead silicate, $5H_2CaSiO_4.2CaPbSO_4$.

Rowlandite. Massive; yttrium silicate, $2Y_2O_3.3SiO_2$.

Salvadorite. Monoclinic; hydrous iron and copper sulphate, $FeSO_4.7H_2O.2(CuSO_4.7H_2O)$.

Sanguinite. Hexagonal or rhombohedral; a silver sulpharsenite.

Senaite. Tri-rhombohedral; oxides of titanium and manganese, $(Fe,Pb)O.2(TiMn)O_2(?)$.

Siderotil. Groups of divergent needles; iron sulphate, $FeSO_4.5H_2O$.

Snarumite. Massive; mainly aluminium silicate.

Stibiotantalite. Tantalo-niobate of antimony, $Sb(TaNb)O_4$.

Sulphoborite. Orthorhombic; a hydrous magnesium sulphate and borate, $3MgSO_4.2Mg_2B_4O_9.12H_2O$.

Svabite. Hexagonal; a hydrous calcium arsenate, perhaps $H_2O.10CaO.3As_2O_5$.

Sychnodymite. Isometric; copper and cobalt sulphide, essentially $(Co,Cu)_4S_5$.

Tetragophosphite. Hydrous aluminium, iron, manganese, magnesium and calcium phosphate, $[(Fe,Mn,Mg,Ca)O]_3P_2O_5.(Al_2O_3)P_2O_5+3H_2O$.

Thalenite. Monoclinic; a yttrium silicate, $2Y_2O_3.4SiO_2.H_2O$.

Tilasite. Granular; a calcium and magnesium fluo-arsenate, $(CaF)MgAsO_4$.

Tripuhyite. Micro-crystalline aggregates; an iron antimonate, $2FeO.Sb_2O_5$.

Umangite. Massive; copper selenide, $CuSe.Cu_2Se$.

Urbanite. Monoclinic; essentially an iron and sodium metasilicate, $(CaMg)SiO_3+2NaFe(SiO_3)_2$.

Valleite. Orthorhombic; a magnesium, calcium, iron and manganese silicate.

Wardite. Massive; a hydrous basic aluminium phosphate, $2Al_2O_3.P_2O_5.4H_2O$.

Wellsite. Monoclinic; a hydrous aluminium, barium, strontium, calcium, magnesium, potassium and sodium silicate, perhaps $RAl_2Si_3O_{10}.3H_2O$.

Willyamite. Cobalt and nickel sulphantimonide, $(NiCo)S(CoNi)Sb$. Near ullmannite.

Zirkelite. Isometric; a calcium zirconate and titanate, $(CaFe)O.2(Zr.Ti.Th.)O_2$.

METALLIC CLASSIFICATION OF MINERALS.

Showing the Various Combinations in Which the Metals Occur in Nature.

Under each metal, with its salts as sub-headings, are mentioned the mineral species in which it is a constituent. Several elements which are acidic in character, but commercially important, are included.

The common metals, Aluminium, Calcium, Copper, Iron, Lead, Magnesium, Manganese, Potassium, and Sodium; (also Phosphorus,) are found in a great number and variety of minerals. In this list, species containing less than ten per cent. of one of these metals do not appear under its heading, although they may appear under other metals. Varieties and doubtful species are not enumerated under the common metals.

Under the less commonly occurring metals are given all minerals containing five per cent.; under the rare or precious metals, a fraction of one per cent.

Minerals containing but one basic element are printed in *italics*. They are given first position following the sub-headings, and are arranged in order of the per cent. of metal they carry. Here are included Sulphantimonides, etc.; Niobates, Tantalates; Phosphates, Arsenates, etc., etc., in which Antimony, etc., are acidic. Under the heavy type headings of these elements will also be found again those minerals into which they enter.

Under these acidic sub-headings, *e. g.*, "Arsenates of Metals," minerals having but the one acid are printed in *italics*.

Minerals containing more than one basic element (or under acidic headings more than one acid), are printed in ordinary brevier, following the simpler compounds in italics, and are arranged in order of the per cent. of metal (or acid) contained. The names of complex compounds are repeated under the headings of the various elements contained.

Aluminium (Al) 27.

Minerals containing less than 10% pure Aluminium are omitted.

Arsenate. Durangite, Liskeardite.
Borate. *Jeremejevite*, Rhodizite.
Carbonate. Dawsonite.
Double Salts. *Topaz*, Svanbergite, Amblygonite, Sodalite, Lepidolite, Ardennite, Zinnwaldite, Cirrolite, Hamlinite.
Fluoride. *Fluellite*, Ralstonite, Prosopite, Chiolite, Gearksutite, Thomsenolite, Cryolite, Pachnolite.
Oxide. *Corundum, Diaspore, Bauxite, Gibbsite*, Chrysoberyl, Spinel, Gahnite, Zincaluminite, Tavistockite, Hydrotalcite.
Phosphate. *Turquois, Sphærite, Peganite, Fischerite, Wardite, Evansite, Wavellite, Variscite, Callainite, Zepharovichite*, Goyazite, Lazulite, Plumbogummite, Eosphorite, Kehoeite, Childrenite.
Silicate. *Dumortierite, Andalusite, Sillimanite, Zunyite, Cyanite, Schrotterite, Collyrite, Allophane, Kaolinite, Halloysite, Newtonite, Pyrophyllite, Cimolite, Montmorillonite*, Sapphirine, Margarite, Staurolite, Kornerupine, Xanthophyllite, Rumpfite, Seybertite, Paragonite. Eucryptite, Zoisite, Muscovite, Anorthite, Meionite, Euclase, Tourmaline, Ottrelite, Hydronephelite, Nephelite, Iolite, Kaliophilite, Thomsonite, Carpholite, Labradorite, Microsommite, Gismondite, Wernerite, Cancrinite, Hauynite, Andesine, Spodumene, Noselite, Lazurite, Epidote, Natrolite, Lepidolite, Corundophylite, Gehlenite, Scolecite, Mesolite, Jadeite, Prehnite, Oligoclase, Leucite, Sarcolite, Analcite, Mizzonite, Hyalophane, Laumontite, Levynite, Daphnite, Anorthoclase, Garnet, Aphrosiderite, Prochlorite, Edingtonite, Gmelinite, Lawsonite, Chabazite, Phillipsite, Albite, Partschinite, Marialite, Orthoclase, Microcline, Beryl, Offrétite, Wellsite, Bliabergite, Caswellite, Hydrobucholzite.
Sulphate. *Felsobanyite, Alumian, Paraluminite, Aluminite, Alunogen*, Fuggerite, Alunite.

Antimony (Sb) 120.

Arsenide. *Allemontite*, Antimonial Arsenic.
Double Salts. *Kermesite*, Kylindrite.
Antimonates of Metals. *Romeite, Atopite, Bindheimite, Monimolite, Magnetostibian*, Manganostibiite, Lewisite, Nadorite, Melanostibian, Ochlorite, Långbanite.
Antimonides of Metals. *Breithauptite, Horsfordite, Dyscrasite*, Willyamite, Ullmannite, Corynite, Wolfachite.
Antimonites of Metals. Mauzeliite, Falkenhaynite.
Native. *Pure Antimony.*
Oxide. *Senarmontite, Valentinite, Cervantite, Stibiconite*, Chondrostibian, Basiliite.
Sulphide. *Stibnite*, Guejarite, Berthierite, Livingstonite, Chalcostibite, Zinkenite, Miargyrite, Plagionite, Warrenite, Stylotypite, Jamesonite, Brongniardite, Semseyite, Andorite, Famatinite, Diaphorite, Freieslebenite, Bournonite, Tetrahedrite, Boulangerite, Epiboulangerite, Pyrostilpnite, Pyrargyrite, Meneghinite, Geocronite, Stephanite, Kilbrickenite, Polybasite, Kobellite, Polyargyrite.

Arsenic (As) 74.9.

Arsenates of Metals. *Berzeliite, Haidingerite, Pharmacolite, Brandtite, Roselite, Scorodite, Carminite, Wapplerite, Caryinite, Forbesite, Trichalcite, Srabite, Cabrerite, Symplesite, Annabergite, Sjögrenite, Chenevixite, Kottigite, Mixite, Uranospinite. Zeunerite, Trögerite, Atelestite, Walpurgite, Trippkeite*, Durangite, Picropharmacolite, Arseniopleite, Conichalcite, Mazapilite, Leucochalcite, Sarkinite, Pharmacosiderite, Olivenite, Adamite, Arseniosiderite, Adelite, Brandtite, Erinite, Lindackerite, Tilasite, Cornwallite, Euchroite, Chondrarsenite, Bayldonite, Lossenite, Hemafibrite, Flinkite, Pitticite, Clinoclasite, Liroconite, Tyrolite, Allactite, Synadelphite, Liskeardite, Hematolite, Mimetite, Chalcophyllite, Rhagite, Ecdemite, Veszelyite, Rhodarsenian.
Arsenides of Metals. *Skutterudite, Safflorite, Chloanthite, Rammelsbergite, Smaltite, Löllingite, Allemontite, Niccolite, Sperrylite, Domeykite, Algodonite, Whitneyite*, Cobaltite, Arsenopyrite, Glaucodot, Gersdorffite, Lorandite, Corynite, Wolfachite, Alloclasite, Rittingerite.
Native. *Pure Arsenic, Arsenolamprite.*
Oxide. *Arsenolite, Claudetite.*
Sulphide. *Realgar, Orpiment*, Binnite, Sartorite, Dufrenoysite, Enargite, Tennantite, Proustite, Guitermanite, Xanthoconite, Jordanite, Epigenite.

Barium (Ba) 137.

Carbonate. *Witherite*, Bromlite, Barytocalcite.
Double Salt. Cappelenite.
Nitrate. *Nitrobarite.*
Phosphate. Uranocircite.
Silicate. Edingtonite, Harmotome, Hyalotekite, Wellsite, Hyalophane, Brewsterite.
Sulphate. *Barite.*

Beryllium (Be or Gl) 9.1.

Aluminate. *Chrysoberyl.*
Double Salt. *Hambergite.*
Phosphate. Beryllonite, Herderite, Hamlinite.
Silicate. *Phenacite, Bertrandite,* Euclase, Trimerite, Beryl, Helvite, Danalite, Epididymite, Leucophanite, Gadolinite.

Bismuth (Bi) 207.5.

Alloys. Bismuth-Gold, Alloclasite, Chilenite, Bismuth-Silver.
Arsenate. *Atelestite, Rhagite,* Walpurgite, Mixite.
Carbonate. *Bismutosphærite, Bismutite.*
Double Salts. *Daubréeite,* Tapalpite.
Native. *Pure Bismuth.*
Oxide. *Bismite,* Montanite.
Selenide. *Guanajuatite.*
Silicate. *Eulytite, Agricolite.*
Sulphide. *Bismuthinite,* Cuprobismutite, Chiviatite, Emplectite, Rezbanyite, Galenobismutite, Matildite, Klaprotholite, Schirmerite, Cosalite, Schapbachite, Wittichenite, Aikinite, Grünauite, Kobellite, Beegerite, Lillianite.
Telluride. *Tetradymite,* Joseite, Wehrlite.
Uranate. *Uranosphaerite.*
Vanadate. *Pucherite.*

Boron (B) 10.9.

Borates of Metals. *Larderellite, Hydroboracite, Heintzite, Bechilite, Colemanite, Lagonite, Primoite, Ulexite, Jeremejevite, Hambergite, Szaibelyite, Borax, Sussexite, Rhodizite,* Boracite, Howlite, Warwickite, Nordenskioldine, Homilite, Cappelenite, Pinakiolite, Tourmaline, Axinite, Sulfoborite.
Oxide. *Sassolite.*
Silicate. Danburite, Datolite.

Cadmium (Cd) 111.7.

Sulphide. *Greenockite,* sometimes Sphalerite and Smithsonite.

Cæsium (Cs) 58.7.

Borate. Rhodizite.
Silicate. Pollucite.

Calcium (Ca) 39.9.

Minerals containing less than 10% pure Calcium are omitted.

Antimonate. Atopite, Romeite.
Arsenate. *Haidingerite, Pharmacolite, Svabite, Conichalcite, Wapplerite,* Roselite, Picropharmacolite, Adelite, Brandtite, Berzeliite, Mazapilite, Caryinite.
Borate. *Colemanite, Bechilite,* Nordenskioldine, Ulexite.
Carbonate. *Calcite, Aragonite, Hydrocalcite,* Dolomite, Pirssonite, Cuprocalcite, Ankerite, Bromlite, Barytocalcite.
Chloride. *Hydrophyllite.*
Double Salts. *Cuspidine, Apatite, Spodiosite, Homilite, Howlite, Titanite, Guarinite, Thaumasite, Mauzeliite,* Dahlite, Herderite, Dysanalyte, Nocerite, Hiortdahlite, Rhodarsenian, Schorlomite, Meliphanite, Tilasite, Leucophanite, Wöhlerite, Keilhauite, Axinite, Cenosite, Dietzeite, Pyrochlore, Rinkite.
Fluoride. *Fluorite,* Gearksutite, Thomsenolite, Pachnolite, Prosopite.
Iodate. *Lautarite.*
Molybdate. *Powellite.*
Niobate. Koppite.
Nitrate. *Nitrocalcite.*
Phosphate. *Monetite, Collophanite, Isoclasite, Martinite, Metabrushite, Brushite,* Tavistockite, Fairfieldite, Messelite, Cirrolite, Goyazite, Calcioferrite.
Silicate. *Wollastonite, Gyrolite, Okenite,* Gehlenite, Grossularite, Monticellite, Vesuvianite, Datolite, Pectolite, Harstigite, Sarcolite, Uvarovite, Melilite, Andradite, Homilite, Schorlomite, Prehnite, Meionite, Zoisite, Apophyllite, Epidote, Pyroxene, Danburite, Piedmontite, Babingtonite, Anorthite, Laubanite, Gismondite, Scolecite, Margarite, Lawsonite, Astochite, Caswellite.
Sulphate. *Anhydrite, Gypsum,* Ettringite, Glauberite, Polyhalite, Syngenite, Wattevillite, Fuggerite.
Sulphide. *Oldhamite.*
Tantalate. Microlite.
Titanate. *Perovskite.*
Tungstate. *Scheelite.*
Vanadate. *Calciovolborthite.*

Carbon (C) 12.

Native. *Diamond, Graphite.* Coal and other Hydrocarbons.
Carbonates of Metals. About forty mineral species, enumerated under the sub-headings, "Carbonates," following metal-headings.

Cerium (Ce) 141.

Double Salts. Fluocerite, Parisite, Bastnäsite, Melanocerite, Tritomite, Caryocerite, Æschynite, Tscheffkinite, Rinkite, Fergusonite, Polymignite, Samarskite.
Fluoride. Tysonite, Yttrocerite.
Niobate. Pyrochlore.
Phosphate. Churchite, Monazite.
Silicate. Cerite, Mosandrite, Johnstrupite, Allanite.

Chromium (Cr) 52.5.

Chromates of Metals. *Crocoite, Phœnicochroite,* Dietzeite, Vauquelinite.
Oxide. Chromite.
Silicate. Uvarovite.
Sulphide. Daubreelite.

Cobalt (Co) 58.7.

Arsenate. *Erythrite*, Roselite, Forbesite.
Arsenide. *Smaltite, Skutterudite, Safflorite*, Nickel-skutterudite.
Carbonate. *Sphærocobaltite, Remingtonite.*
Double Salts. *Cobaltite*, Glaucodot, Alloclasite, Willyamite.
Oxide. Asbolite, Heterogenite, Heubachite.
Sulphate. *Bieberite.*
Sulphide. *Linnæite*, Carrollite.

Copper (Cu) 63.2.

Minerals containing less than 10% pure Copper are omitted.

Antimonide. *Horsfordite.*
Arsenide. *Whitneyite, Algodonite, Domeykite.*
Arsenate. *Clinoclasite, Erinite, Cornwallite, Olivenite, Chalcophyllite, Tyrolite, Euchroite, Trichalcite, Trippkeite*, Leucochalcite, Mixite, Liroconite, Conichalcite, Chenevixite.
Carbonate. *Malachite, Azurite*, Cuprocalcite, Aurichalcite.
Chloride. *Nantokite, Atacamite.*
Double Salts. *Connellite, Tennantite, Tetrahedrite, Enargite, Melanothallite, Famatinite, Footeite, Wittichenite, Antlerite, Falkenhaynite, Kamarezite, Binnite, Chalcostibite, Klaprotholite, Emplectite, Guejarite, Cuprobismutite*, Spangolite, Epigenite, Boléite, Veszelyite, Stylotypite, Lindackerite, Rivotite, Percylite, Bournonite, Aikinite.
Iodide. Cuproiodargyrite.
Native. *Pure Copper.*
Nitrate. *Gerhardtite.*
Oxide. *Pharmelaconite, Melaconite, Cuprite, Tenorite*, Crednerite, Cumengéite.
Phosphate. *Pseudomalachite, Dihydrite, Libethenite, Tagilite*, Torbernite.
Selenite. *Chalcomenite.*
Selenide. *Umangite, Berzelianite*, Crookesite, Eucairite, Zorgite.
Silicate. *Dioptase, Chrysocolla.*
Sulphate. *Brochantite, Langite, Dolerophanite, Arnimite, Hydrocyanite, Herrengrundite, Chalcanthite*, Cyanotrichite, Salvadorite, Krohnkite, Linarite, Cyanochroite, Serpierite.
Sulphide. *Chalcocite, Harrisite, Covellite*, Tennantite, Bornite, Chalcopyrite, Sychnodymite, Stromeyerite, Stannite, Cubanite, Carrolite.
Tungstate. *Cuprotungstite.*
Vanadate. Calciovolborthite, Volborthite, Psittacinite, Mottrammite.

Didymium (Di) 142.

Borate. Caryocerite.
Double Salts. Bastnäsite, Fluocerite, Melanocerite, Tritomite, Æschynite, Polymignite, Weibyeïte, Erdmannite, Wasite, Samarskite.
Fluoride. Tysonite, Yttrocerite.
Phosphate. Rhabdophanite, Monazite.
Silicate. Steenstrupine.

Erbium (Er) 166.

Double Salts. Fluocerite, Fergusonite, Euxenite, Polycrase, Yttrotantalite, Cyrtolite, Nohlite.
Fluoride. Yttrocerite.
Niobate. Sipylite.
Phosphate. Rhabdophanite, Scovillite.
Silicate. Cenosite, Eucrasite.

Germanium (Ge) 73.3.

Sulphide. Argyrodite, Canfieldite.

Gold (Au) 196.7.

Alloys. Palladium-Gold, Bismuth-Gold, Electrum, Gold Amalgam, Küstelite.
Double Salt. Nagyagite.
Native. Gold, generally alloyed.
Telluride. Calaverite, Krennerite, Sylvanite, Müllérine, Petzite.

Iridium (Ir) 192.5.

Alloy. Iridosmine.
Native. Iridium, alloyed with other metals.

Iron (Fe) 55.9.

Minerals containing less than 10% pure Iron are omitted.

Aluminate. *Hercynite.*
Antimonate. Magnetostibian, Långbanite, Melanostibian.
Arsenate. *Pharmacosiderite, Symplesite, Scorodite*, Arseniosiderite, Carminite, Mazapilite, Chenevixite.
Arsenide. *Löllingite, Leucopyrite.*
Borate. *Lagonite.*
Carbonate. *Siderite*, Mesitite, Ankerite.
Chloride. *Lawrencite, Molysite*, Kremersite, Douglasite, Erythrosiderite.
Chromate. *Chromite.*
Double Salts. *Pittieite, Diadochite, Arsenopyrite, Tapiolite*, Ænigmatite, Beudantite, Lossenite, Pyrosmalite, Danalite, Triplite, Schorlomite, Homilite, Partschinite, Glaucodot.
Native. Terrestrial Iron, Meteoric Iron, (always containing nickel and other elements).
Niobate. *Columbite.*
Oxide. *Hematite, Martite, Magnetite, Turgite, Göthite, Limonite, Xanthosiderite*, Magnesioferrite, Plumboferrite, Manganoferrite, Franklinite, Jacobsite, Ilmenite, Ludwigite, Pyroaurite, Chondrostibian.
Phosphate. *Dufrenite, Ludlamite, Beraunite, Vivianite, Cacoxenite, Phosphosid-*

erite, Strengite, Borickite, Chalcosiderite, Triphylite, Koninckite, Childrenite, Barrandite, Calcioferrite, Triploidite, Messelite, Dickinsonite, Lithiophilite.

Silicate. *Cronstedtite, Fayalite, Hoeferite, Hisingerite, Chloropal*, Ilvaite, Thuringite, Aphrosiderite, Almandite, Crocidolite, Riebeckite, Arfvedsonite, Stilpnomelane, Daphnite, Knebelite, Rœpperite, Acmite, Lepidomelane, Strigonite, Andradite, Chrysolite, Prochlorite, Diabantite, Astrophyllite, Chloritoid, Melanotekite, Babingtonite, Delessite, Caledonite, Biotite, Glauconite, Neotocite, Ottrelite, Epidote, Allanite, Staurolite, Piedmontite, Anthophyllite, Diopside, Hypersthene, Crossite, Ransatite, Bliabergite, Caswellite.

Sulphate. *Glockerite, Utahite, Carphosiderite, Raimondite, Amarantite, Fibroferrite, Castanite, Copiapite, Melanterite, Coquimbite, Quenstedtite, Römerite, Ihlëite*, Cyprusite, Jarosite, Voltaite, Metavoltine, Quentenite, Sideronatrite, Knoxvillite, Botryogen, Ferronatrite.

Sulphide. *Troilite, Pyrrhotite, Pyrite, Marcasite*, Pentlandite, Cubanite, Folgerite, Sternbergite, Chalcopyrite, Blueite, Daubreelite, Bornite, Epigenite, Berthierite, Stannite.

Tantalate. *Skogbölite*, Tantalite.

Tellurite. *Durdenite, Emmonsite, Ferrotellurite.*

Tungstate. *Reinite*, Wolframite.

Lanthanum (La) 138.

Carbonate. *Lanthanite.*

Double Salts. Kischtimite, Bastnäsite, Fluocerite, Tritomite, Caryocerite, Melanocerite, Weibyeite, Erdmannite, Polymignite, Æschynite, Samarskite.

Fluoride. Tysonite.

Phosphate. Rhabdophanite, Monazite, Kårarfveite, Scovillite.

Silicate. Bodenite, Steenstrupine, Wasite, Muromontite.

Lead (Pb) 206.4.

Minerals containing less than 10% pure Lead are omitted.

Antimonate. *Bindheimite*, Monimolite.

Arsenate. Bayldonite, Carminite.

Carbonate. *Hydrocerrussite, Cerussite.*

Chloride. *Laurionite, Paralaurionite, Cotunnite*, Cumengéite.

Chromate. *Phœnicochroite, Crocoite.*

Double Salts. *Mendipite, Penfieldite, Matlockite, Leadhillite, Ecdemite, Phosgenite, Pyromorphite, Vanadinite, Ochrolite, Mimetite, Geocronite, Endlichite, Schwartzembergite, Nadorite, Daviesite, Fiedlerite*, Nagyagite, Boléite, Vauquelinite, Lossenite, Percylite, Caracolite, Plumbogummite, Beudantite.

Molybdate. *Wulfenite.*

Native. *Pure Lead.*

Oxide. *Massicot, Minium, Plattnerite*, Plumboferrite.

Selenide. *Clausthalite*, Lehrbachite, Zorgite.

Silicate. *Barysilite*, Ganomalite, Kentrolite, Melanotekite, Hyalotekite.

Sulphate. *Lanarkite, Anglesite*, Caledonite, Linarite, Lossenite.

Sulphide. *Galenite*, Jordanite, Kilbrickenite, Guitermanite, Meneghinite, Beegerite, Boulangerite, Dufrenoysite, Epiboulangerite, Semseyite, Jamesonite, Sartorite, Lillianite, Bournonite, Cosalite, Plagionite, Kobellite, Warrenite, Zinkenite, Diaphorite, Freieslebenite, Aikinite, Galenobismutite, Brongniardite, Schapbachite, Rezbanyite, Chiviatite, Schirmerite, Andorite.

Telluride. *Altaite.*

Tungstate. *Stolzite.*

Uranate. Uraninite.

Vanadate. Brackebuschite, Descloizite, Psittacinite.

Lithium (Li) 7.

Double Salts. Amblygonite, Lepidolite, Zinnwaldite.

Phosphate. Lithiophilite, Triphylite.

Silicate. Eucryptite, Spodumene, Petalite.

Magnesium (Mg) 24.

Minerals containing less than 10% pure Magnesium are omitted.

Arsenate. *Hœrnesite*, Berzeliite, Cabrerite, Roselite, Caryinite, Picropharmacolite, Adelite.

Borate. *Szaibelyite, Ascharite, Pinnoite*, Ludgwigite, Sussexite, Heintzite.

Carbonate. *Magnesite, Hydromagnesite, Nesquehonite, Lansfordite*, Mesitite, Dolomite, Northupite.

Chloride. *Chloromagnesite, Bischofite*, Carnallite, Tachhydrite.

Double Salts. *Wagnerite, Sulfoborite, Lüneburgite*, Humite, Chondrodite, Clinohumite, Warwickite, Nocerite, Boracite, Pinakiolite, Phlogopite.

Fluoride. *Sellaite.*

Molybdate. *Belonesite.*

Nitrate. *Nitromagnesite.*

Oxide. *Periclase, Brucite*, Hydrotalcite, Pyroaurite, Spinel, Magnesioferrite.

Phosphate. *Bobierrite, Newberyite*, Hannayite, Struvite, Hautefeullite.

Silicate. *Forsterite, Serpentine, Enstatite, Deweylite, Talc, Spadaite, Sepiolite*, Chrysolite, Clinochlore, Penninite, Saponite, Pholidolite, Anthophyllite, Monticellite, Hypersthene, Amphibole, Biotite,

Seybertite, Diabantite, Jeffersonite, Delessite, Corundophilite, Xanthophyllite, Sapphirine, Kornerupine, Pyrope, Prochlorite, Genthite, Pyroxene, Caswellite.
Sulphate. *Kieserite, Epsomite,* Kainite, Löweite, Blödite.
Titanate. *Geikielite.*

Manganese (Mn) 54.8.

Minerals containing less than 10% pure Manganese are omitted.

Antimonate. *Manganostibiite,* Magnetostibian, Melanostibian, Basiliite.
Arsenate. *Allactite, Flinkite, Hemafibrite, Chondrarsenite, Sarkinite,* Synadelphite, Sjögruvfite, Hematolite, Arseniopleite, Caryinite, Berzeliite, Brandtite.
Borate. Sussexite.
Carbonate. *Rhodochrosite.*
Chloride. *Scacchite.*
Double Salts. *Braunite, Friedelite,* Långbanite, Rhodarsenian, Ardennite, Triplite, Pyrosmalite.
Oxides. *Manganosite, Psilomelane, Pyrochroite, Hausmanite, Pyrolusite, Polianite, Manganite,* Chalcophanite, Wad, Manganoferrite, Crednerite, Pinakiolite, Chondrostibian, Jacobsite, Franklinite.
Phosphate. *Hureaulite,* Triploidite, Reddingite, Fillowite, Natrophilite, Lithiophilite, Dickinsonite, Eosphorite, Triphylite, Fairfieldite.
Silicate. *Tephroite, Bementite, Caryopilite,* Rhodonite, Neotocite, Ganophyllite, Inesite, Spessartite, Trimerite, Partschinite, Knebelite, Kentrolite, Carpholite, Rœpperite, Piedmontite, Astochite, Harstigite, Ransatite, Caswellite, Bliabergite.
Sulphate. *Szmikite, Mallardite,* Ilesite.
Sulphide. *Alabandite, Hauerite.*
Tungstate. *Hübnerite,* Wolframite.
Titanate. *Pyrophanite.*

Mercury (Hg) 199.8.

Alloy. Amalgam.
Antimonate. Barcenite.
Chloride. *Calomel.*
Double Salt. *Onofrite.*
Native. *Pure Mercury.*
Selenide. *Tiemannite,* Lehrbachite.
Sulphide. *Cinnabar, Metacinnabarite,* Livingstonite.
Tellurate. *Magnolite.*
Telluride. *Coloradoite.*

Molybdenum (Mo) 96.

Molybdates of Metals. *Belonesite, Powellite, Wulfenite.*
Oxide. *Molybdite.*
Sulphide. *Molybdenite.*

Nickel (Ni) 58.6.

Antimonide. *Breithauptite.*
Arsenate. *Annabergite,* Cabrerite, Forbesite, Lindackerite.
Arsenide. *Niccolite, Rammelsbergite, Chloanthite,* Nickel-skutterudite.
Carbonate. *Zaratite.*
Double Salts. *Gersdorffite, Wolfachite, Kallilite, Corynite, Ullmannite,* Willyamite.
Native. Nickel alloyed with iron.
Oxide. *Bunsenite.*
Silicate. *Connarite,* Genthite, Garnierite.
Sulphate. *Morenosite.*
Sulphide. *Millerite, Beyrichite, Polydymite,* Siegenite, Pentlandite, Folgerite, Blueite, Pyrrhotite.
Telluride. *Melonite.*

Niobium (Nb) 93.7.

Niobates of Metals. *Koppite, Ånerodite, Sipylite,* Columbite, Tantalite, Pyrochlore, Samarskite, Fergusonite, Euxenite, Hatchettolite, Æschynite, Polycrase, Dysanalyte, Hielmite, Wöhlerite, Polymignite, Yttrotantalite, Tapiolite, Microlite.

Osmium (Os) 191.

Alloy. Iridosmine.
Sulphide. Laurite.
Oxide. Irite.

Palladium (Pd) 106.2.

Native. Palladium, alloyed with other metals.

Phosphorus (Ph) 31.

Minerals containing less than 10% pure Phosphorus are omitted.

Phosphates of Metals. *Beryllonite, Monetite, Martinite, Lithiophilite, Hannayite, Metabrushite, Variscite, Triphylite, Lazulite, Callainite, Brushite, Cirrolite, Natrophyllite, Collophanite, Fillowite, Barrandite, Dickinsonite, Phosphosiderite, Xenotime, Hureaulite, Fairfieldite, Messelite, Strengite, Zepharovichite, Stercorite, Wavellite, Reddingite, Kominckite, Hopeite, Calcioferrite, Triploidite, Childrenite, Eosphorite, Peganite, Isoclasite, Ludlamite, Turquois, Beraunite, Fischerite, Taristockite, Struvite, Libethenite, Monazite, Vivianite, Churchite, Sphærite, Rhabdophanite, Tagilite, Pseudomalachite,* Amblygonite, Herderite, Apatite, Dahllite, Triplite, Spodiosite, Chalcosiderite, Dufrenite.

Platinum (Pt) 194.3.

Platinum Arsenide. *Sperrylite.*
Native. Platinum, alloyed with other metals.

Potassium (K) 39.

Minerals containing less than 10% pure Potassium are omitted.

Borate. Rhodizite, Heintzite.
Chloride. *Sylvite*, Douglasite, Erythrosiderite, Kainite, Carnallite, Kremersite.
Fluoride. Hieratite.
Nitrate. *Niter.*
Silicate. Astochite, Leucite, Orthoclase, Microcline, Lepidolite, Hyalophane.
Sulphate. *Misenite*, Taylorite, Aphthitalite, Syngenite, Picromerite, Cyanochroite, Polyhalite.

Rubidium (Rb) 85.2.

Borate. Rhodizite.

Ruthenium (Ru) 103.5.

Sulphide. *Laurite.*

Selenium (Se) 78.9.

Native. Selen-Tellurium, Selensulphur.
Selenides of Metals. *Berzelianite, Umangite, Guanajuatite, Eucairite, Zorgite, Crookesite, Clausthalite, Tiemannite, Naumannite, Lehrbachite*, Rittingerite, Aguilarite, Onofrite.
Selenite of Metals. *Chalcomenite.*

Silicon (Si) 28.

Oxides. *Quartz, Tridymite, Opal.*
Silicates of Metals. A large number of mineral species are included in this class. They are enumerated under the sub-headings "Silicates," following the different metal-headings.

Silver (Ag) 107.7.

Alloy. Chilenite, Küstelite, Electrum.
Antimonide. *Dyscrasite, Animikite.*
Arsenide. *Arsenargentite, Huntilite.*
Bromide. *Bromyrite.*
Carbonate. *Selbite.*
Chloride. *Cerargyrite*, Bordosite, Bolétite, Huantajayite.
Double Salts. *Polyargyrite, Aguilarite, Polybasite, Argyrodite, Stephanite, Proustite, Xanthoconite, Embolite, Sanguinite, Pyrargyrite, Iodobromite, Pyrostilpnite, Rittingerite, Miargyrite, Matildite, Plenargyrite*, Canfieldite, Tapalpite, Brongniardite, Freieslebenite, Diaphorite, Schirmerite, Schapbachite, Stylotypite, Dürfeldtite, Polytelite.
Iodide. *Iodyrite*, Tocornalite, Cuproiodargyrite.
Native. *Pure Silver*, Cupriferous Silver.
Selenide. *Naumannite*, Eucairite, Crookesite.
Sulphide. *Argentite, Acanthite, Daleminzite*, Jalpaite, Stromeyerite, Sternbergite, Andorite, Frieseite, Castillite, Richmondite.
Telluride. *Stützite, Hessite*, Petzite, Krennerite, Sylvanite, Müllérine, Calaverite.

Sodium (Na) 23.

Minerals containing less than 10% pure Sodium are omitted.

Borate. *Borax.*
Carbonate. *Thermonatrite, Trona, Natron*, Dawsonite, Gay-Lussite, Pirssonite.
Chloride. *Halite.*
Double Salts. *Sulphohalite, Hanksite, Nitroglauberite, Darapskite*, Northupite, Noselite, Cancrinite, Hauynite, Marialite, Eudialyte, Lazurite.
Fluoride. Cryolite, Chiolite, Pachnolite, Thomsenolite.
Nitrate. *Soda Niter.*
Phosphate. Beryllonite, Natrophilite, Stercorite.
Silicate. Sodalite, Natrolite, Jadeite, Nephelite, Hydronephelite, Analcite, Albite, Acmite, Eudidymite, Astochite.
Sulphate. *Thenardite, Mirabilite*, Glauberite, Loweite, Blödite, Köhnkite, Ferronatrite, Lecontite, Caracolite, Sideronatrite.

Strontium (Sr) 87.3.

Carbonate. *Strontianite.*
Silicate. Brewsterite.
Sulphate. *Celestite.*

Sulphur (S) 32.

Native. *Sulphur*, Selensulphur.
Sulphides, Sulphates, etc., include many minerals. They are given under the different metals.

Tantalum (Ta) 182.

Tantalates of Metals. Tapiolite, Skogbolite, Tantalite, Microlite, Hielmite, Yttrotantalite, Hatchettolite, Samarskite, Fergusonite. Columbite.

Tellurium (Te) 125.

Alloys. Selen-tellurium, Tetradymite, Wehrlite, Josëite.
Native. Tellurium, alloyed with other metals.
Oxide. *Tellurite.*
Tellurates of Metals. *Montanite.*
Tellurides of Metals. *Sylvanite, Krennerite, Calaverite, Coloradoite, Altaite, Hessite, Petzite, Stützite*, Tapalpite, Nagyagite.
Tellurites of Metals. *Emmonsite, Durdenite.*

Thallium (Tl) 203.7.

Double Salt. *Lorandite.*
Selenide. Crookesite.

Thorium (Th) 232.

Double Salts. *Auerlite*, Calciothorite, Eucrasite, Caryocerite, Tritomite, Freyalite, Polymignite, Kochelite.
Oxide. Mackintoshite.
Silicate. *Orangeite*, *Thorite*, Yttrialite, Steenstrupine, (Monazite Sand.)
Thorates of Metals. Thorogummite, Æschynite, Pyrochlore.
Uranate. Uraninite.

Tin (Sn) 117.4.

Borate. Nordenskiöldine.
Native. *Pure Tin.*
Oxide. *Cassiterite.*
Stannates of Metals. Kylindrite, Canfieldite, Hielmite.
Sulphide. Stannite.

Titanium (Ti) 48.

Borate. Warwickite.
Oxide. *Rutile*, *Brookite*, *Anatase*, Senaite, Ilmenite, Pseudobrookite.
Silicate. Astrophyllite.
Titanates of Metals. *Geikielite*, *Pyrophanite*, *Perovskite*, Dysanalyte, Titanite, Guarinite, Polycrase, Keilhauite, Euxenite, Warwickite, Schorlomite, Æschynite, Lewisite, Neptunite, Polymignite, Pyrochlore, Ænigmatite, Mauzeliite.

Tungsten (W) 183.6.

Oxide. *Tungstite*, *Meymacite.*
Tungstates of Metals. *Scheelite*, *Wolframite*, *Reinite*, *Hübnerite*, *Cuprotungstite*, *Stolzite*, Powellite.

Uranium (U) 240.

Arsenate. Trögerite, Uranospinite, Zeunerite, Walpurgite.
Carbonate. Volgite, Uranothallite, Liebigite.
Double Salts. Hatchettolite, Samarskite, Euxenite, Polycrase.
Niobate. Ånnerödite.
Oxide. Mackintoshite.
Phosphate. *Phosphuranylite*, Autunite, Torbernite, Uranocircite.
Silicate. Uranophane.
Sulphate. Uranopilite, Johannite.
Uranates of Metals. *Uraninite*, *Uranosphærite.*
Altered Minerals, containing Uranium. Gummite, Thorogummite, Yttrogummite.

Vanadium (V) 51.1.

Silicate. Roscoelite.
Vanadates of Metals. *Calciovolborthite*, *Pucherite*, *Brackebuschite*, *Descloizite*, *Psittacinite*, *Volborthite*, Vanadinite, Endlichite, Ardennite.

Yttrium (Y) 89.

Carbonate. *Tengerite.*
Double Salts. Cappelenite, Fergusonite, Polycrase, Euxenite, Yttrotantalite, Samarskite, Melanocerite, Ånnerödite, Hielmite.
Fluoride. Yttrocerite.
Phosphate. *Xenotime.*
Silicates. *Thalenite*, *Rowlandite*, Yttrialite, Gadolinite, Cenosite.

Zinc (Zn) 65.1.

Arsenate. *Adamite*, *Köttigite.*
Carbonate. *Hydrozincite*, *Smithsonite*, Aurichalcite.
Double Salts. *Voltzite*, Veszelyte, Danalite.
Phosphate. Kehoeite.
Native. (doubtful.)
Oxide. *Zincite*, Gahnite, Chalcophanite, Franklinite.
Phosphate. *Hopeite.*
Silicate. *Willemite*, *Calamine*, Rœpperite.
Sulphate. *Zinkosite*, *Goslarite*, Zincaluminite.
Sulphide. *Sphalerite*, *Wurtzite.*
Vanadate. Descloizite.

Zirconium (Zr) 90.4.

Double Salts. Låvenite, Rosenbuschite.
Oxide. *Baddeleyite.*
Silicate. *Zircon.*
Zirconates of Metals. Polymignite, Hiortdahlite, Wöhlerite.

SUPPLEMENT.

Aluminium Silicate Celsian, Erionite.
Antimony. Tripuhyite, Franckeite.
Arsenic. Bismutosmaltite, Manganberzeliite.
Barium Silicate. Celsian.
Bismuth. *Grünlingite*, Bismutosmaltite.
Chromium. Mitchellite, Beresovite.
Cobalt. Bismutosmaltite.
Gold Tel. Goldschmidtite Kalgoorlite.
Iron. Sulphide, Gunnarite.
Lead. Beresovite, Nasonite, Franckeite.
Manganese. Glaucochroite, Manganberzeliite.
Nickel Sulphide. Gunnarite.
Silver. Miersite, Kalgoorlite, Goldschmidtite.
Tantalum and Niobium. Mossite.
Tellurium. Goldschmidtite, Kalgoorlite, Grünlingite.
Tin, Double Salt. Franckeite.
Uranium and Vanadium. Carnotite.
Zinc Silicate. Clinohedrite, Hardystonite.