106° 15′, and this, with crystallized specimens, is an important means of distinction. Composition: Carbonate of lime 54·4, carbonate of magnesia 45·6 = 100. Formula, ($\frac{1}{2}$ Ca $\frac{1}{2}$ Mg) O_3C.

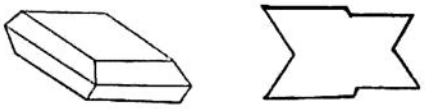
Siderite (iron carbonate). — A valuable ore of iron, sometimes called *steel ore*. Crystallizes and cleaves like the preceding, but much heavier. G = 3·7–3·9. Color white to gray, but becoming brown on exposure to the air because the iron oxidizes easily and changes to limonite. Cleavage angle 107°. Occurs also massive, gray to brown, with feeble luster. Formula, FeO_3C (= FeO + CO_2).

Aragonite. — Like calcite in composition, but occurring in prismatic form, without the cleavages of calcite. Calcite and aragonite are hence *paramorphs*. G = 2·9–2·94, which is above that of calcite. Shells, while consisting generally of calcium carbonate, often have a large part of the material in the *aragonite* state; and hence aragonite is present through most uncrystalline limestones.

8. *Sulphates.*

Gypsum (or hydrous calcium sulphate). — Very soft. H = 1. One of the few minerals that may be easily impressed with the teeth without producing a grating sensation. Often massive and fine granular. Colors from white to black; the white is common *alabaster*. Also occurs in crystals, with pearly luster on a cleavage surface. Figs. 54, 55 give two of the forms of the crystals. It cleaves in broad pearly plates or folia, which look like mica, but are softer, and not elastic. Unlike limestone and other minerals, a little heat reduces it to powder, making the common *plaster of Paris* of the shops. It consists of sulphuric acid 46·51, lime 32·56, water 20·93 = 100. Formula, CaO_4S + 2 aq (= CaO. SO_3 2 aq).

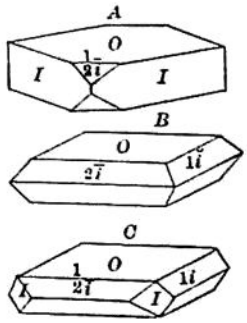
54. 55.



Anhydrite (calcium sulphate, without water). — White and grayish, reddish. H = 3–3½. Cleavage affords rectangular blocks or plates. It differs from gypsum also in affording no water when heated.

Barite (or heavy spar, barium sulphate, also called barytes). — Occurs in tabular crystals, some of the forms of which are given in Fig. 56. It is remarkable for its high specific gravity (G = 4·3–4·7), whence the name, from the Greek for *weight*. It contains sulphuric acid 34·3, baryta 65·7 = 100. Formula, BaO_4S (= BaO + SO_3). It is ground up and used for adulterating white lead paint. It is common as a gangue of different ores.

56.



9. *Phosphates, Fluorides.*

Apatite (calcium phosphate). — Occurs in six-sided prisms of a greenish to bluish color, often looking like beryl (and this deceptive appearance led to the name from the Greek, signifying *to deceive*), but easily distinguished from beryl by its inferior hardness, as it may be scratched with a knife. Composition: Phosphoric acid 40·92, lime 53·80, chlorine 6·82=101·54, for a chlorine-bearing variety. Another kind contains fluorine instead of chlorine. Much used for making a fertilizer.

Fluorite (fluor spar, calcium fluoride). — Crystallizes in cubes, octahedrons, and other related forms, which cleave easily in four directions, parallel to the faces of the regular octahedron, the faces of cleavage making angles with one another of 109° 28′. Often granular-massive. Easily scratched with a file. Colors, clear purple, yellow, blue, often white, and of other shades. Massive varieties are worked into vases, etc., which have much beauty. When powdered and thrown on a shovel heated nearly to redness, it phosphoresces brightly. Composition: Fluorine 48·7, calcium 51·3 = 100.