

This hydrate is sparingly soluble in water, and more so in cold than in warm water. About 700 grains of pure water, free from carbonic acid, will dissolve 1 grain of lime.

Carbonate of lime, (common limestone,) consists of

Lime,	-	-	-	-	56 parts.
Carbonic acid,	-	-	-	-	44 “
					100

It constitutes the great mass of the limestone and chalk which form so large a portion of the crust of the earth. It is the principal constituent of shells, and forms the calcareous matter of marls.

Carbonate of lime is nearly if not quite insoluble in pure water, but is readily dissolved in water containing carbonic acid, and as rain and snow water always contain carbonic acid, lime upon or near the surface of the earth is unceasingly being dissolved and diminished in quantity—an exceedingly interesting fact in an agricultural point of view.

LIME in combination with phosphoric acid is called *phospate of lime*, and sometimes “bone earth.” It constitutes, with a smaller proportion of carbonate of lime, nearly all the earthy matter of bones. It also exists in small proportion in shells.

It is insoluble in pure water, but the presence of acids (even the weakest of all, carbonic acid,) renders it soluble. Phosphoric acid and lime unite in several proportions, but the combination that most concerns us, is that which forms part of bones and shells, which is

Phosphoric acid,	-	-	-	-	52 parts.
Lime,	-	-	-	-	48 “
					100

Sulphate of lime, is well known under the names of *gypsum* or *plaster of paris*, and when pure consists of

Sulphuric acid,	-	-	-	-	46 parts.
Lime,	-	-	-	-	33 “
Water,	-	-	-	-	21 “
					100

Having thus briefly glanced at some of the properties and combinations of lime, we proceed to treat of lime as a manure, &c.

## SECTION 2.—Of lime as a manure or as a constituent of plants.

The elementary constituents of all plants, for the most part consist of carbon, hydrogen, oxygen and nitrogen. The three first exists in the largest proportion, and form the great bulk of the plant, the last is equally necessary, and with the rest, form the albumen, gluten and other nitrogenous compounds which principally abound in the seeds and juices of plants. The air of our atmosphere always contains water, carbonic acid and ammonia, which furnish to plants the above named elements nearly equal perhaps to their wants, after the first stages of their growth. In former days these were believed to be all that were essential to vegetation, but mo-