

constituents. But bones contain, when fresh, from 40 to 50 per cent. of organic matter, which is capable of affording about six per cent. of ammonia by its decomposition. Bone dust as sold in the market usually contains from 60 to 70 per cent. of phosphate of lime. The drying, boiling and sometimes burning of the bones renders the quantity of mineral matter comparatively greater than is found in fresh bones. Besides in bones, combinations of phosphoric acid are found in wood ashes, in guanos, in poudrette, and in very small quantities in some marls and limestones. To supply phosphates we should either look to bones, to Mexican or other phosphatic guanos.

Mode of Application — The manner and form in which a manure is applied is frequently of as much importance as the manure itself. Bone dust is comparatively of high cost, and very often the form in which it may be applied is of great consequence. Bone dust should never be applied except in the finest powder, or dissolved in sulphuric acid, and forming the well known superphosphate of Lime. True economy, which is the judicious application of means, requires that it should always be dissolved before using it.

In agriculture we have to deal with two varieties of the phosphate of lime; one, the bone earth phosphate or bone dust, in its natural form; the other, the acid phosphate of lime, superphosphate, or biphosphate. One of the greatest boons which science has conferred on agriculture is that of dissolving bones before using them. In the condition in which bones originally exist, and even when they are ground to the finest powder, they are still comparatively insoluble, and we must apply a large quantity to supply the growing crop. When dissolved by means of sulphuric acid they are then very soluble, can be spread much more equally over the soil, and will exert a much speedier influence on the crop. It is not out of place here to speak of some of the more important changes which take place on the addition of sulphuric acid to bone dust or phosphate of lime. Pure neutral phosphate of lime contains of

Phosphoric acid,.....	48.50 per cent.
Lime,	51.50 per cent.

Biphosphate of lime is composed of

Phosphoric acid,.....	71.50 per cent.
Lime,.....	28.50 per cent.

This latter compound is very soluble and is produced in this way. In chemistry we have what are called weak and strong acids. When a weak acid is united to a base, a stronger acid will expel it and seize on the base itself. We have a familiar example