

68. But Liebig's process did something more than gain time—he obtained the tri-calcic phosphate of the bone in a thoroughly soluble condition, and in this respect **the chemical change he accomplished went beyond that which naturally occurred in the soil.** The difference will be more clearly understood by reference to the following diagram :—

COMPOSITION OF TRI-CALCIC PHOSPHATE.	RE-AGENT EMPLOYED.	PRODUCTS OF DECOMPOSITION.
Phosphoric acid. }	Water. }	Mono-calcic phosphate.
Lime. }	Water. }	
Lime. }	Sulphuric acid.	Sulphate of lime.
Lime. }		

69. If you compare this diagram with that immediately preceding it, you will see that **a different form of phosphate of lime is obtained** from that which had been produced in the soil **by the slow decomposition** of the bone. In the former case a bi-calcic phosphate was produced, and this is a **slowly soluble** phosphate of lime. In the latter case we have mono-calcic phosphate produced, and this is **rapidly soluble** in water.

70. The treatment of bone by means of sulphuric acid thus introduced by Liebig therefore produced a new kind of manure which has been distinguished as **super-phosphate of lime.** You will readily understand that it was called **super-phosphate of lime**, because the phosphoric acid which had been combined with three equivalents of lime **had been concentrated** upon one equivalent of lime, and the lime was thus **super-phosphated**, or, in other words, the lime was **over-charged** with phosphoric acid. It must be remembered that not only is mono-calcic phosphate thus formed, but a large quantity of sulphate of lime is also produced by the action of the sulphuric acid on the bone, and consequently the