equivalents of water to make up the deficiency of lime.

65. You will also carefully note that in each case we have **three equivalents of base** combined with the one equivalent of phosphoric acid. In one case lime is the only base, in the two others they consist of lime and water, but in each case there are three equivalents of base. Hence, phosphate of lime is frequently spoken of as a **tri-basic phosphate**, or a three-base phosphate. I have gone somewhat fully into these details, because **if you clearly understand these terms**, you will be the better able to trace the many important uses which these three phosphates of lime serve in the nutrition of our crops.

66. We are now in a position to follow out our explanation of the changes which take place in bones after they have been applied to the soil. The phosphate of lime present in **bones** is the **tri-calcic phosphate**. When the bones are acted upon in the soil by rain-water, which, as you know, contains carbonic acid—or when acted upon by the carbonic acid produced in the soil—in each case we get one equivalent of the lime removed by the carbonic acid, and the tri-calcic phosphate acted upon then **becomes bi-calcic phosphate and carbonate of lime.** The bi-calcic phosphate dissolves gradually in water, and is thus taken up into the circulation of plants in a soluble form. The changes in the size and condition of the bones which have been mentioned as being adopted (60, 62, 63) all helped in various degrees to promote their decomposition. The action of the carbonic acid and water was greater when the bones were broken into small pieces, because a larger surface was thus exposed to their influence. The fermented bones were quickly acted upon in the soil, because by this fermentation they had been made soft, and consequently they soon broke up in the soil.