

Let us just merely think over the wonderful changes that take place during the progress of that little seed until it accomplishes the end for which it was planted. How few among these men who see the seed-planting and the tree-growing constantly going on, have any idea of the various changes that occur in the interim between the one period and the other. Take for example the case of a potato; which has such wonderful possibilities in the nutrition of the human family. How many men continually associated with the cultivation of that vegetable have any intelligent knowledge of what might be called its inner history. We know that a potato lives a certain life, is subject to certain diseases, and dies. There is no doubt that a great deal of the loss which every country sustains in the cultivation of the potato plant is properly attributable to a want of knowledge concerning that plant. Again take the case of a grain of oats that is put into the ground. It must have heat, air, and moisture in order to have growth, and any one of these being excluded the growth is arrested. If you have moisture and heat and no air, or if you have air and moisture present but too low a temperature, life is arrested. Hence we find the utility of the application of such principles in connection with the stowage system, by which we can send fruit from here to London at a safely regulated temperature. Again there is the plan of preserving food by taking away moisture. The three things I have mentioned will produce budding, but you want nutrition. The seed planted in well-tilled ground gets the three essentials I have referred to, and it gets the other necessity for growth, nutrition. We put the little seed into the ground, and we find it grow into a large plant eventually. From what did it grow? Apparently from nothing? No,—not from nothing. The prolonged investigations and efforts of the chemists of the Old World enabled them to discover that the ground furnishes certain elements that are necessary for its growth,—namely, phosphate of lime, potash and ammonia. Very few appreciate the wonderful part played by phosphate of lime in nature. It is present in the bones of a man, it is present in his blood, it is present even in his tears. If you go from animate nature to inanimate life you will find phosphate of lime in oats and straw and anything that grows. Burn a bone and you will get bone ash, and that is phosphate of lime. The phosphoric acid is united in three forms. If you take away by chemical means one portion you have a more soluble phosphate called superphosphate. We require potash, and that is present