the interesting result obtained with the growth of clover at the Experimental Farm during the past year. They will be referred to by Mr. Craig when be addresses you to-morrow on the subject of cover crops for the orchard.

In the growth of clover there is not only a storing up of the nitrogen from the atmosphere, but there is also an appropriation of carbonic acid, which may be said to the foundation of the vegetable matter. This vegetable matter, when it decomposes in the soil, gives rise to humus, a most useful constituent of soils. Further, the roots of the clover have attacked the mineral matter of the soil, dissolving and absorbing it. This mineral matter is transmitted throughout the whole material of the clover plant. It is, therefore, in a certain sense digested. When we turn under the clover crop this mineral matter is returned to the soil in a form useful to succeeding crops. It will do good service in the nourishment of our fruit trees. Something like 800 pounds of mineral matter per acre are in this way worked over by a clover crop. This is a very important function of clover. The vegetable matter of the clover is particularly of value in conserving the soil moisture. We have seen to what a large extent water enters into the composition, not only of the fruit, but of the leaves and the wood of the apple tree. Anything which in seasons of drought will conserve the soil moisture for the use of our crops is of great importance—hence the value of building of our soils in organic matter.

Mr. Newmam—Is there any gain of nitrogen if the clover is cut and taken away?

Mr. Shutt—That which you take away is of course, lost to the soil—unless the resulting manure is carefully returned. But the roots are rich in nitrogen and they are necessarily left in the soil. An acre will contain more than 3 tons of such roots. The assimilation of nitrogen by the clover comes about in this way: The clovers are no more in themselves able to assimilate atmospheric nitrogen than any other kind of farm plant. The absorbtion or assimilation is done through the agency of certain microscopic plants which exist in the soil and are commonly known as germs or microbes. These are able to appropriate the free nitrogen of the air which exists in the small interstices between two particles of soil. These microbes attach themselves to the roots of the clover plant and there they form nodules or tubercules. If you could examine these, you would find, with a microscope of great power, the nodules full of these microscopic plants. These microbes in some way are able to appropriate, as I have said, the free nitrogen which exists between the particles of the soil. This nitrogen is then transmitted to the main tissues of the clover plant, where it is converted into the organic substances of which I have spoken. When a soil contains a large amount of combined nitrogen, there is but little disposition on the part of the clover plants to assimilate free nitrogen. It would appear that it is only in soils poor in nitrogen (nitrogen-hungry, as it is called) that this disposition to assimilate free nitrogen is well developed. The clover, in its early stages of growth, cannot make use of the atmospheric nitrogen because it has not these tubercules. It consequently must then draw on the nitrogen compounds in the soil for the necessary supply for its growth, so that the nitrogen contained in the young