

and soil, throughout the large portion of the known world, upon the composition of cereals.

*By Mr. McMillan :*

Q. Have you tested wheat in a greenish condition and when it is fully ripe? I will tell you the reason why I have asked that question. We have been under the impression that cutting wheat on the green side was advantageous, but a miller at Seaforth instructed the farmers to allow the wheat to get ripe, because if it were cut on the green side, it would not make strong baker's flour?—A. I have no direct experience in the matter, but from what I have already said, with regard to the cutting of grasses before they were quite ripe, for the purpose of making hay, it will be seen that we have an analogous case to the one you have stated. I have said that as the said seed matures, the material which is stored up in the leaf and stem migrates to the seed. Now, if that plant is cut before the seeds are fully formed—before this migration of material is complete—the migratory action will go on after the grain is cut; but if the grain is cut such a length of time previous to ripening that the vegetable cell dies before all assimilated matter can pass to the seed, then that material remains in the straw and enriches the straw, but to a similar extent the seed is impoverished. The life of a vegetable cell after you sever the plant would depend very greatly on the amount of moisture and temperature.

Q. On the weather?—A. Certainly. In some cases the cells would die comparatively quickly and the progress of migration would soon cease.

*By Mr. Semple :*

Q. I think it is important that you should test wheat when it is quite ripe and a week earlier, in order to ascertain the value of these different methods?—A. It is possible that we shall do that. The plant is all the time storing up material until the seeds are formed, and then the material so assimilated goes to the seed. If the plant is cut before the requisite time, the seed must necessarily be impoverished.

*By Mr. McMillan :*

Q. When I put the question about Indian corn, I recognized, of course, that leguminous plants are valuable. But is it not a fact, that all these things are returned back to the soil in the shape of manure, and that corn is after all the more profitable crop?—A. The object of good farming is to keep the plant food on the farm. But plant food in the soil is there to be used. I have no objections to farmers using plants which are exhaustive; such are often the richest in food value and give us the best returns. That, however, does not affect the fact that in the leguminosæ we have a distinct advantage over other plants, because they can appropriate from the air a material, worth at least 15 cents per pound, whether we buy it as a plant food or animal food. This must not be understood, however, as speaking against the Indian corn crop. I wish our farmers could be brought to see there is no necessity to impoverish the land by growing exhaustive crops. I say, exhaust the soil, if necessary, but take good care of the manure. As long as the plant food remains in the soil, it is of no value to anybody. If any profit is to result from it, it must be converted into plant substance and then into animal products. Experiments have shown that from 75 to 95 per cent of the food taken from the soil by the plant, is returned to the soil in the manure.

*By the Chairman :*

Q. Which is most valuable for enriching the soil, to turn down a crop of clover or buckwheat?—Clover, most decidedly. Buckwheat only returns to the soil what it has taken from the soil, while clover, in addition, returns to the soil that which it has taken from the air, namely, nitrogen.

*By Mr. Roome :*

Q. If clover and leguminosæ in general take this atmospheric nitrogen by their root tubercles and not by their leaves, how can they appropriate this nitrogen?—