

ments in the manner and with the substances described.

*Address before the Monroe County Agricultural Society, at Rochester, N. Y., October, 1844, by Dr. Daniel Lee.*

**Mr. President, and Farmers of Monroe:—** The fact cannot have escaped your notice, that competition in growing breadstuffs, provisions, wool, and other agricultural products, is fast becoming a matter of deep interest to those that must live, and hope to prosper, by cultivating the earth. This growing competition is quite unavoidable. The introduction of labor-saving machinery into every branch of the mechanic arts, throughout the whole civilized world, is driving millions from factories and workshops into rural pursuits, who, but for the invention of *iron men*, that eat no bread, nor meat, nor wear any clothing, had remained the good customers of the farmers, instead of becoming his active rivals, if not ruinous competitors. Agriculture is the great business of civilized man; but, like every other branch of human industry, it has its ups and downs, its sunshine and its storms. Its sunshine is most enjoyed by those that avail themselves of all substantial improvements in the art and the science of good husbandry. These advantages give to the fortunate few, who are wise enough to study and understand them, a double capacity to supply the markets of the world, by increasing to that extent the productive power of their hands and their fields.

Think not that I have a hobby to ride in this matter. I fear bitter experience will soon, too soon, demonstrate the truth of the remark, that it is *unsafe* for the farmers of Western New York to despise the improvements of the age, and the competition of the whole world beside.

At the Agricultural School near Dublin, the pupils have raised, this season, a large field of potatoes averaging 750 bushels per acre. With a population of ten millions living on a territory but little larger than this State, and exporting more bushels of grain than all the United States, the fact has already been established, that in spite of your protective duty of ten cents a bushel, Irishmen can, and do, export potatoes to Boston and New York, and sell them at a little over a half cent a pound!

Nothing is more probable than the supposition that some one of you has harvested and brought to this market 100 bushels of wheat from five acres of land. Let me assume that the wheat weighed 60 pounds to the bushel, or 6,000 pounds, and that the straw weighed twice as much as the grain—in all 18,000 pounds.

As a simple, practical question, tell me how much of these 18,000 pounds of matter came from the soil? Tell me how much came from the air?

Conceding that what your cultivated plants draw from the ever-moving atmosphere, need not be restored to the fields whence they were taken, can you say as much of the alkalies and other minerals removed with your crops, from the soil

where they grew? Long experience answers this question in the negative.

I regard it as one of the greatest discoveries of the age, that about 97 per cent. of the ingredients which make up the whole substance of wheat, rye, corn, barley, oats, peas, and beans, exist in the air in inexhaustible quantities. To transmute these aerial form bodies into the plants above-named, and into grass and roots, at the smallest expense, is the object of nearly all your hard work.

If I were to burn in your presence 100 pounds of wheat, including both straw and seed, you would know of a certainty that this bread-bearing plant might all be converted into air and vapor, except something less than three pounds of ash, which would remain. Now who among you that loves good bread, and would be glad to produce it as cheaply as any one, will refuse to learn how nature changes all the vegetable matter thrown into the air by combustion, fermentation, rotting, and the respiration of all animals, back again into grain, grass, and roots? Believe me, nature is quite as willing to give you 40 bushels of wheat to the acre, and from one bushel of seed, as she is 20, if you will only *study* and *obey* her uniform laws.

A wheat plant is a living being; and the number which may be grown and brought to full maturity on an acre depends on the *quality* and *quantity* of food which you feed to them. It may not be profitable to feed so high as to raise at the rate of 320 bushels per acre, as one gentleman in England professes to have done. But that you may grow 40 bushels on an acre, at a less price per bushel than with any less number, I have no doubt.

The raw materials to form 36,000 pounds of ripe wheat plants are not expensive in this section of the country. Nor is the knowledge expensive to combine and use these materials, so as to save a considerable portion of the ordinary cost of producing 40 bushels of this grain. But to render this information entirely satisfactory and generally available, an experimental farm is needed, to demonstrate practically how much of the ingredients contained in a field (i. e., what per-centage) comes from the air, and what from the soil.

A few years since, the mayor of Albany (Friend Humphrey, Esq.) planted three acres in corn, on the poor sand plain near the city. The quantity of vegetable mould, or organic matter, in the soil was small. As an experiment, he dropped in each hill on two acres, with the seed, a few grains (or perhaps drachms) of *horn shavings*. The other acre received nothing as a fertilizer. On the former he harvested 60 bushels per acre of shelled corn; on the latter about 15.

I learn from the *Southern Planter*, that farmers in that neighborhood, as an experiment, have paid so high as \$3 per 100 pounds for guano—the price of good pork, in many places—to feed to corn and other plants; and find the food not too expensive for profit. Thousands of tons of this fertilizer are annually consumed in Great Britain, at the cost of 20 or more dollars per ton.