of which will be noted presently. It also admits of the application of coarse manure when the soil is moist, consequently the manure ferments readily and increases the humus of the soil, and when the pea crop is removed the ground is mellow, moist, and in good condition for wheat.

When manure is applied during the summer, it should be mixed with the soil as soon as possible to prevent drying. It is not likely that simply drying the manure would result in any very serious loss of plant food, but when dry manure is mixed with a comparatively dry soil, the necessary fermentation cannot take place, since, as was previously explained, moisture is necessary for the development of nitrifying bacteria. As a result, the manure is apt to form masses of dry, inert material in the soil, which never seem to become properly mixed with the soil afterwards. For the same reasons, plowing under manure during dry weather may injure the water-holding power of the soil, since there is not sufficient moisture to ferment the manure and change it into humus, and the soil is rendered too open in texture. The fault is not in the manure, but lies in the time and method of applying it.

VII. VALUATION OF FERTILIZING CONSTITUENTS IN MANURE.

Few subjects present more real difficulties than the valuation of the fertilizing constituents of farmyard manure. Farmyard manure varies so in composition that it is impossible to estimate with any degree of accuracy how much plant food a given sample contains without first subjecting it to a chemical analysis. Even if the composition is known the difficulty is by no means overcome, for the next point to decide is what money value to attach to the different elements of plant food in the manure, a problem more difficult to solve than the first. A common method is to value each constituent at the price per pound which would have to be paid for it if purchased in the form of a commercial fertilizer. It is argued that were it not for farmyard manure the farmer would be forced to use commercial fertilizers; consequently the manure is worth whatever it saves him in expenditure for its equivalent in commercial fertilizers. From this point of view the argument is perfectly sound; but there is another way of looking at the question, and it may well be asked whether commercial fertilizers are always *worth* what they *cost*. For example, a pound of nitrogen in a good commercial fertilizer usually costs about fifteen cents in the United States, and this value is frequently employed in valuing the nitrogen in farmyard manure and in fodders. In valuing fodders in England, Lawes and Gilbert value nitrogen in the form of ammonia at four pence per pound, which is equivalent to about 9.8 cents per pound for nitrogen, or say ten cents per pound. Now, because nitrogen costs fifteen cents per pound in the United States and ten cents per pound in England, does it follow that nitrogen is worth more to the American farmer than to the English farmer? There is a difference between what a thing is worth and what it costs, as everyone knows, and therefore there are two ways of valuing the constituents of plant food in any manure or fertilizer. It is possible to ascertain, approximately, the value of a manure pile or of certain fodders in terms of commercial fertilizers; but if it is required to find just how much the manure and fodders are worth, so far as increased productivity of the soil or increased value of the land is concerned, probably a very different scale of values may be necessary. It is a comparatively simple matter to show, according to the first method, that plant food to the value of $50 or $100 per acre has been added to a certain farm, and to reason therefrom that