

by 25 tons of barn-yard manure, though nearly double the weight of that obtained without any such application, was not materially increased in nutritive value. It has also been pretty clearly shown, that large quantities of manure are inefficacious with this crop. The produce from 35 tons of farm-yard manure, was less than the produce from 25 tons of the same manure. This was demonstrated in two instances, so that it may safely be said that where 35 tons of farm-yard manure were used, 10 of them were absolutely thrown away. Whether these results would occur with all varieties of potatoes, in all seasons, and with all descriptions of soil, are points that only further experiment can decide.

The potato disease, it is thought, is gradually disappearing in most parts of Great Britain. Early planting and early digging are spoken of as the means which have been most successful in bringing about this improvement. Various kinds of manure have been tried with a view of ascertaining if any particular kind secured immunity from disease. An experiment with seven different manures applied to "Walker's early potatoes," gave no very definite results. Rape-cake, 7½ cwt. to the acre, gave the smallest per centage of diseased tubers. A top-dressing is highly recommended in the *Farmers' Magazine*, consisting of 56lbs. sulphate of soda, 56lbs. sulphate of magnesia, and 56lbs. of salt per acre, mixed and sown broadcast as soon as the sets are planted. This application is described as particularly beneficial when the crop is grown on light soils. Dr. J. Lang, in his Prize Essay on the Potato, published in the Journal of the Royal Agricultural Society, declares it to be his opinion, derived from a considerable experience in the moist warm climate of the south of Devon, that the potato disease is of a fungoid nature, increased in virulence by atmospheric causes; that all manures are injurious except lime and salt; that the earliest potatoes in ripening should be exclusively grown; that earthing up repeatedly with fine soil is the only effectual preventive to the ravages of the disease, and that *no potato is diseased which is covered with more than three inches of soil*. The Rev. E. F. Manby, author of another able, well-written essay, also urges early planting and for planting on a limited scale, strongly recommends the use of sprouted seed potatoes. He would especially urge this plan in the case of late potatoes. This method he argues secures rapidity and luxuriance of growth. Moreover, "you ensure a plant, you have no misses, no blind eyes, but up they come, regular and equal, like a well-disciplined regiment of soldiers, every one in its place. They will be ready for getting up full a month before others planted in the ordinary way; and when the annual complaint arises that the disease has again appeared, you will have taken up your crop in a good state of preservation." In the *London Field*, of Oct. 8, a letter appears, which details an experiment tried by the writer during the past season as follows:—

"The beginning of March my potatoes were planted in rows three feet apart, and twelve inches between each plant (instead of rather more than two feet between the rows, and ten inches between each plant); and notwithstanding the late dry summer I have the most astonishing crop of every sort planted, to the great surprise and admiration of various gardeners and others who have come to see them, and who assert that their largest potatoes are not larger than the smallest of mine, as in fact there are no small refuse. The pink kidneys are now being dug up, although a week later might be better, as the haulm is still standing three feet long, green and gross, whilst all the haulm in other gardens has nearly disappeared owing to the late drouth. On being asked why this plan was adopted, the reasons were, having always remarked that the outside plant at the end of each row produced a greater crop and finer potatoes than any other, and bearing in mind the Weedon system of planting wheat in three rows three feet apart, I was induced to do so, as by that system also the additional space between the rows there is fresh earth for the next year's crop, where they should be planted, and at the same time expecting a dry summer, it occurred to me that the additional foot of earth when the potatoes were hilled up would prevent the drouth from reaching the plant, which on examination during the

dry weather was the case, and as proof the usual dressing of manure placed in rows with the potato (contrary to custom) has disappeared owing to the moisture. The land planted is not quite a quarter of an acre, light earth, subsoil chalk, and has been planted with potatoes many years; but never produced half so much as at present, or so fine and clear."

A gardener residing at Troyes, states that he has discovered an effectual cure for the potato disease. Having observed that everybody living in the quarter of the town occupied by tanners escaped the cholera, he determined to try the virtue of tan when planting potatoes. For that purpose he placed a shovelful of tan in the trench under the seed in a part of a field, and planted the remainder in the ordinary way. On digging out the potatoes, he found that those which were planted near the tan were perfectly sound, while the others were diseased. He found, further, that potatoes were preserved in the winter by spreading tan on the floor of the storehouse.

The *Farmers' Magazine* recommends taking up the tubers before they have attained a state of maturity, rather than run the risk of obtaining greater weight by allowing them to remain longer in the ground to ripen." That potatoes are often injured by being allowed to remain in the ground too long, there can be no doubt; but it seems to us quite as clear that it is not safe to dig them "before they have attained a state of maturity." The unripe condition is as unfavourable for sound keeping as the over-ripe condition. These experiments, discussions, and opinions respecting our most useful vegetable, cannot fail to do good, and ought to interest everybody who has a square rod of garden ground to dig and plant.

### Husbanding of Manures.

*Summary of the discussion on the Husbanding of Manures, held at Utica and Albany, by ex-President A. B. Conger.*

I. Where sufficient has been reserved for arable lands, barnyard manure may be spread upon pastures and meadows under the following restrictions:

(a) If spread early in the spring on pastures designed for immediate use, it should not be of the droppings of that species of animals intended to be placed in the pastures.

(b) It should never be spread upon meadows in the spring, as the coarser parts will be caught by the hay-rake, and mixed with the hay, imparting to it a musty smell, if not tainting and poisoning it with fungus.

(c) It may be evenly spread on meadows at any time after harvest, and lightly harrowed or bushed, especially if the after-math is heavy, so that the grass may not be smothered.

(d) The weather should indicate the absence of high winds, the approach of moderate rains, or the presence of copious dews, so that the ammoniacal portion of the manure may not be lost.

(e) On rapidly sloping lands a heavier top dressing should be applied near the summit, unless furrows such as are necessary in irrigation are made, so as to prevent the manure being washed with heavy rains to the bottom.

(f) In winter no manure should be spread on either pastures or meadows when hard frozen, even when most of the atmospheric conditions above alluded to are present, unless the surface is or soon will be covered with snow, and then only on ground either level or gently rolling, so that in case of a thaw the melting snows may not render the distribution of the manure comparatively useless.

II. Under a system of rotation of crops, as supposed in the question, the husbanding of manures is indispensable to thrift in farming, and is to be regulated according to the supply of litter and the method of feeding adopted.

III. On farms whose principal staple is grain, the amount of straw is not unfrequently in excess of the feeding material reserved, and in such case it is necessary to spread it profusely over the barnyard, that it may be trodden down by cattle and sheep and mixed with their droppings. In such cases, it is sufficient that the barnyard should be dished or provided with one or more tanks for the holding of the drainage of the mass; that fermentation should be allowed to proceed until the straw is disintegrated sufficiently either to turn the mass into heaps (into which the liquid contents of the tanks are to be conveyed by pumps

and troughs,) or drawn out into the fields for spring and fall crops—of which method as generally in all departments of the farm service, the labor that can be applied is the discriminating test.

IV. Where from the scarcity of straw upon a farm, its high price in neighboring markets, or its being an element of food prepared for stock, it is necessary to economize its use, the system of box or stall feeding is to be resorted to, and the husbanding of manures is determined as the feeding is either of animals to be fattened or reared.

V. In the former case, neat cattle may be placed in boxes not less than eight by ten feet, the bottoms slightly dished with a view to drainage, or being filled with muck or other absorbents, and the animal wintered with slight additions of cut straw as litter, so to prevent the loss of hair and other cutaneous affections, (which proceed from the heating of straw if too liberally supplied,) and the whole mass of droppings, etc., left until removed to the fields.

VI. In the latter case, that of the rearing of young animals a like method may be pursued, but if their value will admit of a greater regard being paid to cleanliness, etc.; the box should have a slatted floor of oak or other durable stripes one and a half inches thick, three inches wide, and half an inch apart, over a paved, clayed, or cemented floor, inclined so as to carry the drainage of the box into gutters leading to a tank, and the manure removed as often at least as once in six weeks, placed under cover of a roof either permanent, or of boards battened, turning on pins and moved by a long lever as in sheds for drying of brick, the liquid manure (if not used separately) being pumped from the tank and conveyed by troughs over the mass so as to prevent fire-lanquing. It used separately, the sheds are to be opened to occasional rains for the same purpose.

VII. The manure from animals stabled in the ordinary way is to be treated as last above described, and it is desirable that the manure shed should be constructed with access to it from a level below that on which the manure is deposited, so that in winter the manure may be carted out upon lands plowed in the fall, the fresh masses placed on top, preserving those underlying from being thoroughly frozen.

VIII. When sheep are alone raised, they should be kept under sheds with small yards connected therewith, and their droppings may be treated either as in the case of fattening or growing animals in the discretion of the owner.

IX. Where no portion of the manure is designed for top dressing of pastures, that of horses and neat cattle may be always advantageously placed under the same cover, their different capacities for developing heat operating favourably against over-heating.

X. As the value of straw as an article of food if cut up, mixed with feed, thoroughly wetted and allowed to stand in mass for a few hours so as to develop heat, or if steamed, is at its lowest price worth at least twice as much for food as for the manure resulting from its use as litter; where beds of muck or peat exist on a farm, these should be ditched and afterwards pared, so that by the use of these materials when dried the straw may be largely used as an article of food; a greater number of animals kept on the farm, and greater masses of manure made, and with material more valuable than straw as an absorbent and fertilizer, and for the preservation of the droppings of cattle, at a more uniform rate of temperature.—*Journal N. Y. Ag. Society*

### A few Words about Lime.

LIME is not, as was once supposed, an *element*, but consists of the metal calcium united with the gas oxygen, and is properly an oxide of calcium, just as potash, soda, and magnesia, are oxides of potassium, sodium, magnesium. It is never found pure in nature, except occasionally in the craters of volcanoes, but is usually united with carbonic acid, for which it has a strong attraction. In this state it is neutral and insoluble in pure water. When limestone, or any other form of carbonate of lime, is exposed to a sufficiently high temperature, with access of air or moisture, the carbonic acid gas is driven off, and the lime which remains is called quick or caustic, from its strong alkaline re-action. When such lime is plunged in water for a short time, or water is poured upon it, heat is evolved, the lime swells, cracks, gives off much watery vapour, and finally falls to a powder. This powder, or slaked lime, is a hydrate of lime, water being chemically combined with it. In this state it is still caustic, though somewhat milder than when fresh from the kiln.

The rise of temperature is so great when large heaps of good lime are suddenly slaked, as to inflame gunpowder and scorch wood, it certainly exceeds, according to Pelletier, 500 degrees; and when the