

—that well-made *farmyard manure* is the standard of economical efficiency, as 'no other' (says Dr. Anderson) "fulfils the conditions of a general manure containing all the constituents of a crop in a state fit for assimilation, being derived from the *vegetable and animal* kingdom, and most effectually by the mixture of both." Peruvian guano, is another very composite and valuable manure. Although its consumption is said to have declined from July '55 to July 1860 by a total diminution of 90,000 tons, it is still held to be the cheapest source of ammonia. I would mention incidentally as very important to be generally known, on the authority of Dr. Anderson, whose late valuable contribution to agricultural chemistry I cannot too highly recommend for its clear practical views, so plainly set forth "that it is no uncommon occurrence to find a difference of 11. or even 12. per ton, and in an extreme case 31, between the values of cargoes of Peruvian guano which are sold at the same price." There may come a time when we shall be glad to meet the demands of an impoverished soil and an increasing population, to adopt the principle practised centuries ago by our new friends the Celestials, with their worldly sagacity, namely, the principle of restoring to the land everything that is taken away from it in crops. "The amount of phosphates in our edible crops is far beyond anything ever seen in natural wild plants; therefore the supply required by a dense population and obtained in the excessive development of seeds and roots in cultivated plants, must be given to the soil in the shape of manure, the best being that derived from man who consumes the crops.

The rotation of crops, which takes advantage of the fact that one crop requires more of one ingredient and less of some other, than another does, and the occasional use of fallow, which allows the weather to act and render soluble a fresh supply of mineral matter, are only different branches of the same great principle of agriculture. The cereals and grass require silica; turnips and potatoes, more of the alkalies; peas, and beans, and clover, lime and sulphates; and thus may be alternated with advantage, although all require a full supply of the phosphates, in which night-soil is particularly rich." A grave stigma of reproach will continue to rest upon our skill and enterprise as a nation, so long as we permit this most valuable of manures to be worse than wantonly wasted. The growth of vegetables for the supply of man in this great city, according to Mr. Cuthill, requires no less than 12,000 acres of the richest land. "This," says Dr. Wynter, in his work on the "London Commissariat," "seems an insufficient area for the supply of so many mouths, but manure and spade husbandry compensate for the lack of space. By these agencies, four and sometimes five crops are extracted from the land in the course of the year. The old-fashioned farmer, accustomed to restrictions of old-fashioned leases,

would stare at such a statement, and ask how long it would last? But his surprise would be still greater at being told, that after every earance the ground is deeply trenched, and its powers restored with a load of manure to every 30 square feet of ground. This is the secret of the return, and here we have a striking example of town and country reciprocation: the same waggon that brings a load of cabbages, is seen returning a few hours later filled with dung. An exact balance, as far as it goes, is thus kept up, and the manure, instead of remaining to fester among human beings, is carted away to make vegetables. What a pity the system cannot be extended to the whole sewage, instead of allowing it to pollute the Thames!" Nature, we are told, affords an appropriate vegetation to each class of animal. It is not by accident that the reindeer finds its support from the snow-covered lichen, or the camel from its thorny shrub, or the chamois a sufficient supply in the scanty vegetation of its Alpine home; but it is in obedience to the great law of nature, that wherever plants exist we find animals adapted to make use of their nutritious products.

The same principle applies itself, in a more familiar sphere, to the selection and management of stock, the grazing of cattle and sheep, with reference to soil, climate, and herbage. And no problem connected with the economy of farming is more important to be solved than the adoption of the breed of cattle and sheep most calculated to yield the largest balance of profit from the food consumed, with the most judicious general management. The different breeds are best adapted to their native pastures; and though they may, and have been greatly improved, they can very rarely be displaced with impunity. How would the heavy Cotswold or the fat Liecester enjoy a scramble, in company with the active game-like little Welsh, in search of a scanty breakfast on his native mountains! What has been done by skill, capital, and enterprise, in bringing to perfection some of our choicest breeds of cattle and sheep, is too well known and appreciated to need special reference. It has not, however, been effected without a constant studious attention to the principle I am advocating, on which success mainly depends. The food directly or indirectly derived from vegetables must be skillfully adapted in quality and quantity to the requirements of the animal to be sustained or fed; and the animal must have such vigour of constitution and aptitude to thrive and fatten as shall enable it most beneficially to assimilate the largest amount of nourishment to be derived from the food presented to it. The formation of animals, breeding and grazing in all their departments, are amenable to this law of vegetable and animal dependence. How much valuable food is wasted by badly-bred animals, with no robustness of constitution, and but little aptitude to fatten; and how many a well-bred animal