speaking, however, their action may be regarded as two-fold: either bearing directly on the plant, by being carried with the sap into the alimentary organs, and forming its nourishment, or upon the soil itself, by forming new combination with its bases, and increasing its power of production. To the former class belong more especially what are termed the animal and vegetable manures, which are the ordinary collection of the farm: in the latter class, are to be comprehended the mineral manures, such as lime, marl, &c., which can only be derived from the earth. We had better examine them separately.

Common manure consists of the excrements of animals and the refuse of the farm crops, mixed together: in a state of decomposition, which takes place under certain conditions of temperature and moisture, the materials of the former are already in a sufficient state of putrefaction, or nearly so, and those of the latter, are also capable of becoming so very soon: but when they are dried, as in the case of hay, straw, and other litter, they proceed through the various stages of the process more slowly, and are greatly assisted by their conjunction with the more juicy substances of the former. In this state, having undergone various chemical changes, it forms the principal dressing with which farmers annually supply their grounds; the common practice being to have it partially fermented before it is applied, and then to allow the final decomposition to proceed in the soil. It is the continued addition of manuring substances to the upper mould, which chiefly distinguishes it from the subsoil, in color and texture, and imparts to it its superior fertility. The finest natural soils require putrescent manure to call into action their inherent nutrient principles. It is this that imparts to them their power of productiveness; for, as I already told you, the fertility of land does not depend so much on the earths which form its basis as upon the quantity of carbonaceous matters they contain, capable of becoming solvent in the liquid portion of the soil, and of entering into those particular forms of chemical combination which fit them for the purposes of vegetation. Every soil contains, at least, the three earths—clay, sand, and lime, and sometimes, also, magnesia; but if you were to mix three earths together in the proper proportions to constitute what you would consider the most fertile natural soil, choose the most favorable aspect as to sun and shelter, place any of the farm crops you like in it, and water them ever so carefully, still not one of them would succeed, unless you also supplied them sufficiently with liquid nutriment. Neither water, nor sun, nor shelter, nor air, nor earth, would bring them to maturity; but place the same plants in four separate plots of garden ground, filled with the same pure earths and *with good well-rotted manure*, and they would all grow vigorously, notwithstanding the diversity of the soil; and each would contain the usual earthy constituents of plants, notwithstanding the absence of these from the soil, *having derived them from the manure.* Pure earths, therefore, cannot, of themselves, directly nourish plants.

Results mainly similar have been obtained from experiments with manure, as regards their influences in various conditions of decomposition; those which are most putrid invariably produce the most speedy effect, but the least permanent. This has always been an open question between practical farmers and scientific men, and is not yet finally decided. The subject has been placed in a very clear point of view, and illustrated by a number of details, which are very interesting, and seem to be very conclusive. For example, when we manure two pieces of the same ground, the one with a mixture of dung and straw in a state of complete decomposition, and the other with an equal quantity of the same materials newly made, it has been found that the crop on the ground manured with the rotten dung is much better than the other the first year; but the second year, the ground having the fresh manure is better than it: the same result takes place the third season, after which both would appear to be equally exhausted. Here, it is evident, that the well-rotted manure acted soonest, and was soonest exhausted; demonstrating the fact, that carbon only acts as a manure when in a particular state of combination; and that this state, whatever it may be, is evidently produced by putrefaction. Another experiment, which has been made, confirms this principle still more fully. A quantity of dry shavings were allowed to remain in a moist place till they began to exhibit incipient fermentation, when they were dug into a piece of ground of fair average power, but completely exhausted by severe cropping. The first two years it produced nothing more than the other ground alongside, which had not received any manure; the third year it yielded more; the next it yielded more still; the fifth it reached its maximum of fertility, after which it declined every year till the ninth, when it was again entirely exhausted. Here, again, the effect of the manure evidently depended, as before, on the progress of putrefaction; so that you will now perceive from these accounts, that a point of good practice is, always to employ manuring substances as nearly as possible in that degree of putrefaction which is requisite for the special purpose intended. Some crops, as turnips and other small seeds, require a quick action of the manure in the first stage of their growth, or the crop may entirely fail; and, therefore, it needs to be applied in a state of complete decomposition: while in the case of potatoes and other slow-growing plants, the same degree of previous preparation is less necessary. Generally speaking, the management of manure in the farm-yard is not attended with much difficulty. Some substances do not require to be decomposed artificially—as sea-weed, &c.—since their particles easily break up of them-