

Should that danger however, be apprehended, an addition of road scrapings, or earth of any kind, will prevent it; and in winter the cleanings of the cow-house, as being of a colder nature, will answer the purpose.

When plants and their seeds are consumed by animals, nearly half of their weight in a dry state, is given out from their lungs, or by perspiration from the skin, in a gaseous form, chiefly as carbonic acid gas and water, with some ammonia; the remainder of their substance, together with the effete or dead matter of the animal organs, are rejected, as dung or urine, except that portion retained as nourishment by growing and fattening animals. The *solid excrement* contains the woody fibre, the insoluble animal matter and salts; and the *urine*, the more soluble salts and substance rich in nitrogen. If no care be taken of the urine and it be allowed to run about the yard, it soon putrefies—its nitrogen flies off in the shape of ammonia; its salts are carried away by every shower of rain; and, although a portion of it may be saved by its mixture with the dung of the cattle, yet the greater part of its valuable contents are evaporated by the action of the atmosphere. If it be allowed to drain into a tank or other receptacle, it there also rapidly undergoes putrefaction; and if this be not checked a considerable part of the ammonia produced will escape with the sulphur and phosphorus, resulting from the decomposition of the salts containing these substances; occasioning the intolerable stench observed in such cases.—Now the ammonia, and the alkaline and earthy salts, are by much the most valuable part of farm-yard or stable dung, and the former is always more abundant, when cattle are fed with corn, oil cake, and other rich food. Without ammonia no seed could be produced; and without alkaline and earthy salts, neither seeds nor plants could exist.

It is the deficiency of some of these substances, when moisture is not wanting, which is the cause of land producing poor crops; and it is the almost total absence of some or all of them, which is the cause of complete sterility. Instances may almost everywhere be found of land, which though abounding in humus—such as healthy and peaty soils—are, notwithstanding, incapable of bearing grain. If the valuable substances above mentioned be wasted in the manner described—which is too often the case, to an enormous extent—the crops will be very deficient; and if to this waste be added, the carrying away of large portions of the produce—as when hay and straw are sold and no

manure returned—the land will soon cease to bear crops. To increase the quantity of manure raised on the land; should therefore be the constant aim of every farmer; hay should never be sold unless two tons of stable litter are returned for every load sent off the farm; and, unless the farm contains a larger portion of rough pasture, the horse teams should be kept in the stables, and soiled during the summer and autumn on green food; every portion of apparently refuse vegetable and animal matter should be carefully collected and added to the dung-heap; and in this manner it is inconceivable what additional quantities of excellent muck may be produced. The manure thus made, and not fermented, is generally applied either in its fresh state, or only partially turned, to clay land fallows which are to be sown with wheat; as being of a colder nature than winter-made dung, it will not occasion the crop to be pushed so hastily forward as to occasion straw instead of corn.

If attempts be made to supply the place of farm-yard dung, by *any one salt*, or, in other words, by two or three only of the elements of plants—nitrate of soda, or nitrate of potash, or sulphate of lime, (*gypsum*,) for instance—it will succeed only when all the others happen to be present on the soil by the effect of previous manuring; and will inevitably fail where those other needful substances are either absent or very deficient. Now, it is extremely difficult to ascertain in what salt the soil is really deficient; care must be taken therefore, in the application of artificial manures, that they contain all the elements included in the muck for which they are substituted. They are usually found, more or less in the dung heap; how needful, therefore it is that the farmer should take care of that manure produced upon his own land which certainly he knows he can safely rely.

It has been stated before, that the most efficient part of farm-yard dung is that small portion, invisible in the mass, which consists of earthy and alkaline salts and ammonia. The other ingredients which constitute the great bulk of manures, consisting of carbon and the elements of water, are abundantly supplied by the atmosphere to the growing plants, and therefore, a loss of these by needless fermentation or neglect, is of little importance, were it not that their loss is unavoidably accompanied with the waste of the more essential substances in the manure described. It should be the object of the farmer, not only to prevent the waste of such precious substances by every means that knowledge and ingenuity can devise, but also to