abounding proportion of ammonia and uric acid, both the alkali and the acid containing a large and essential proportion of nitrogen. Uric acid probably exists in the urine of all animals that subsist even partially on animal matters. It has been found in that of man and of our domestic fowls; the urine of the boa-constrictor and several others of the serpent tribe is nearly pure uric acid.

It would be a natural conclusion, from these facts, that the more nitrogenous the food consumed by the animal, the more powerful would be the fertilizing effect of its urine. Some careful experiments made long since with the urine from a large dairy of cows in Scotland support this conclusion ("Quar. Jour. Ag.," vol. iv., p. 96.) Their urine, when fed on the white globe turnip, was found to be larger in quantity, but less effective as a fertilizer, than when they were consuming the yellow turnip or rutabaga, and much less so than when they were fed on brewers' or distillers' grains.

These observations all concur with those of the owners of cake-fed cattle or sheep; the manure is much increased in value, its effects more powerful, and yet more permanent. The policy of applying both liquid and solid inorganic manure in their recent or putrified state has long engaged the attention of the farmer and the chemist; the tendency of the latest researches rather leads to the conclusion that, in both cases, the manure is best applied in as fresh a state as possible. And to this opinion Professor Tanner inclines, in his recently-published prize essay. When speaking of the application of the manure of the farm to clay soils ("Jour. Roy. Ag. Soc.," vol. xx., p. 331) he remarks: We have other reasons which favour the application of dung to the fallows whilst the fermentation is in its earliest stage. In the fermentation of dung, we have important chemical changes taking place amongst the elements which enter into its composition. The great object in fermenting manure is to bring waste matter from the animal body and certain products of vegetable life in such a condition that they can again be useful for the support of vegetation. This fermentation of the dung may be carried out in two ways: the one will materially diminish its fertilizing powers; but by the other plan the change may be controlled so that the manurial properties may, in a great measure, be preserved, although some slight loss is inevitable I have estimated, from the analyses given by Dr. Voelcker as the results of an examination of farmyard manure in its fresh and also in a well-rotted condition, that the ingredients in very superior manure, calculated at their market value, are worth 1s. per ton more when the dung is in a fresh condition that when it has become thoroughly decayed. This loss is experienced when the manure has been carefully fermented for experimental purposes; but when the decomposition takes place under careless management—when, for instance, the drainage from the manure is not carefully preserved—the waste is far greater, so as materially to affect the finances of the farm. In the application of dung in the early stage of fermentation, we have this change taking place in the soil under circumstances which ensure us against loss; for we know enough of the power of these retentive soils to be assured that what is entrusted to their custody will be safely retained for promoting vegetable growth.

The laborious researches of Professor Voelcker, on the composition and changes of farmyard manure ("Jour. R. A. S.," vol. xvii., p. 191), tend to lead us to similar conclusions. Without attempting to follow the Professor through the detail of his ample precautions to attain a fair mixture of the dung (including the straw), made by the horse, the cow, and the pig, I can yet give, I hope, a useful digest of the chief of his laborious researches. Some of his results were —1, That a fresh dung, the proportion of soluble organic and mineral substances is small; 2, of insoluble, large; 3, of ammonia small; 4, of nitrogen, inconsiderable; 5, the organic soluble matters are by far the most valuable—they contain (in equal parts) more than three times as much nitrogen as the insoluable; 6, that dung contains all the constituents of cultivated plants; 7, that the same substances are found in both the soluble and insoluble portion; 8, the principal constituent of the soluble ash of dung is potash; 9, both the soluble and insoluble ash contain much soluble silica, combined either with potash or lime; 10, the prominent constituent of the soluble ash of fresh dung is silicate of potash; 11, of its insoluble ash, lime; 12 (let the reader mark this important fact), that of the soluble ash of fresh dung, 19¼ per cent. is phosphate of lime, in the insoluble ash only 9½. It has been found, in fact, that bone-dust, moistened with a little water, in a few days yields a considerable quantity of soluble phosphate of lime, and that this solubility rapidly increases with the putrefaction of the gelatine of the bones.

From the result of other trials, the Professor seems to lean to the opinion that the spreading of farmyard compost on the surface of the soil, for even a considerable period before it is ploughed in, is by no means so injurious a practice as we have hitherto been led to suppose ("Quar. Jour. Ag., 1857, p. 155). He says, that "on all soils with a moderate proportion of clay, no fear need be entertained of valuable fertilizing substances becoming wasted, if the manure cannot be ploughed in at once. Fresh, and even well-rotted dung contains very little free ammonia; and since active fermentation, and with it the further evolution of free ammonia, is stopped by spreading out the manure on the field, valuable manuring matters cannot escape into the air by adopting this plan."

If this is a reasonable conclusion, it goes far to remove our dread of losing, on such soils, the