

it will, generally speaking, be much more economical to apply manure in the solid than in the liquid state. When liquid manure can be obtained in any quantity, and applied exactly as it is required, no method, perhaps, produces more striking results. Its invigorating effects are immediately seen, and by them we are apt to be led to form an estimate of liquid manure higher, perhaps, than that which it actually deserves, and even to conceive it to be superior to, and likely to form a substitute for, the solid farm-yard manure. I do not, however, think that this is consistent with what we know of its chemical composition, which should incline us to class it rather as an auxiliary, such as guano, sulphate of ammonia, and the like. Viewed in this way its importance cannot be over-estimated, but I confess I conceive it doubtful whether its advantages are likely to be felt, excepting upon what may be called altogether exceptional farms, where its quantity is so great that it becomes desirable to erect machinery for its economic distribution. That such cases exist, the experience of several distinguished farmers seems unequivocally to show, but nothing would be more rash than to attempt the extension of their systems to the general husbandry of the country. In fact, we must have solid as well as liquid manure, and for the very important reason that the latter is deficient in phosphates, which are among the most important and needful elements of our cereal crops; and wherever the quantity of liquid manure does not exceed that produced on ordinary farms. I agree with Mr. Finnie in thinking that the best and most economical plan is to convert it, by means of absorbents, into solid form, rather than to attempt the application of it partly in that and partly in the liquid form. On the subject of these absorbents we have heard a good deal lately, and peat, charcoal, and various other substances have been recommended for the purpose, especially of retaining the ammonia. Some experiments and analyses, made in the laboratory of the Society on this subject, will be found in the last number of the Transactions, which show that in this respect peat itself greatly surpasses charcoal or any other substance. In these experiments, it was found that solution of ammonia was absorbed in the most effectual manner by dried peat, and that even when the saturated peat was exposed to the air until it became dry, it retained a very large quantity of ammonia. It was, however, always observed that a larger quantity of ammonia was absorbed by the peat than was retained by it, after it was allowed to become dry; in some instances as much as half escaping in the latter case; and I think the fact an important one, because it indicates what practice confirms—namely, the necessity of keeping the dung-heaps in a state of moderate moisture, which is the condition best adapted

for preventing the escape of its ammonia. There cannot, on the other hand, be anything more important than the avoidance of too large a quantity of moisture, as nothing is more prejudicial to the manure heap than its exposure to all the vicissitudes of our climate—at one moment saturated with rain, or more than saturated, at another dried up by the heat of the sun, in both of which cases a loss of ammonia must be occurring with much more than the average rapidity. All the gentlemen who took part in the discussion were fully alive to this, and it afforded me much satisfaction to observe that one and all of them supported the introduction of correct manure depots, which I anticipate will be the next great improvement in the arrangement of our farm steadings, for it is only under cover that the perfect preservation of manure can be effected, or all those precautions taken, which are required to protect it from loss. Such opinions, however, though they are consistent with theory, and are borne out by the observations made on the superior value of the manure produced by the system of box feeding, and other similar plans, have not as yet been sufficiently substantiated by experiment. So far as I know, we have only one experiment on the comparative value of manure, made under cover and without, that of Mr. Campbell, of Craigie, to which I referred at the meeting; and I mention the matter again here, because it would be doing a good service to the progress of agriculture if any of our members could be induced to institute an extended series of experiments on this subject. The condition in which farm-yard manure should be applied is a question which has been fully discussed by several of the speakers, and the general opinion is, that in autumn it should be applied pretty fresh, but that in spring it should be well and thoroughly rotted. Such, I need scarcely say, is the general opinion, and it is that also to which we should be directly led by theoretical considerations. The rotting of manure is, in fact, the conversion of its nitrogen into ammonia, the state in which it is absorbed by the plant, and when the manure is to lie long in the ground before that process is to take place, it is obvious that the less of its nitrogen that is converted into the condition of the volatile and soluble ammonia, the less likely will it be to lose by the protracted exposure to the vicissitudes of the winter. Exactly the reverse of this should be the farmer's object when he applies his manure in spring. He must then endeavor to have as much of its nitrogen in the form of ammonia as possible, as we know well that the abundant supply of that substance is most valuable as giving a start to the young plant, and bringing it rapidly through the first stage of its tender existence. Such should obviously be the system, where farm-yard manure alone is to be employed; but it