

question of his teacher, and he has to consult his books, he might be looked upon as no teacher at all, because when he is expected to be learned he is found to be learning, and an unfavourable conclusion both to books and the man thus hastily drawn,—the expectation being that *common sense* would have supplied the required answer, for *common sense* in any calling is nothing else than a knowledge of the principles ready seasoned in the mind, and capable of clear and handy application. To too many farmers the useful science of arithmetic is a mystery; and when it is considered how necessary a knowledge of figures is to give system and accuracy to every transaction, it is to be lamented that when there is so much facility for acquiring even this wonderfully useful part of education, it is so much neglected. I consider there is nothing more conducive to success in any business than a thorough training in the art of keeping accounts. Bookkeeping is just as necessary to the farmer as to the merchant. A profit and loss account is the "compass" in business; by it only can we avoid the losses and crosses of haphazard management. I do not intend following this subject further in the meantime; it may at some future meeting of this Club be profitably pursued. I think our intention in taking it up was, not to point out the way or the means, but simply to strengthen the hands of those eminently qualified gentlemen engaged in devising means to ameliorate the condition of those who have been too long hevers of wood and drawers of water.

#### ON THE USE OF GYPSUM.

I purpose directing your attention to another subject, which at this particular season will call loudly for immediate consideration: "The proper time to apply gypsum or plaster; the quantity necessary to effect the greatest benefit; with other details connected with this wonderful fertilizer. I am quite sure you are all ready to entertain it immediately, but before solving the question practically, and to allow a little time for reflection, it may not be amiss to glance at some of the conclusions at which scientific gentlemen have arrived regarding its mode of action. Although gypsum is largely used in this country as well as at home, there is great difference of opinion as to its value as a manure, and amongst learned men contrary theories put forward as to its mode of action. Sir H. Davy held the opinion that its influence on clover and plants of that description is due to their naturally containing a large proportion of sulphate of lime (gypsum or plaster), and on examining the ashes of these plants, he found they afforded considerable quantities of it, and concluded that this substance might form a necessary part of their woody fibre, and that where gypsum failed

to produce good results the soil naturally contained so much of the salt as to render an artificial supply unnecessary. He did not regard gypsum as a source of sulphur peculiarly, but considered the whole salt beneficial to a certain class of vegetables. Liebig "explains its action on the grasses by reference to its power of converting volatile carbonate of ammonia into the more fixed sulphate of the same base; when sulphate of lime is mixed with carbonate of ammonia all smell soon disappears; by a mutual interchange of elements carbonate of lime and sulphate of ammonia is formed, which latter, not being volatile, remains in the liquid. To this power, then, of fixing ammonia, he attributes the action of gypsum as manure, and that in applying it to the land we in fact manure with an ammoniacal salt. Bousingault, another celebrated chemist, propounds another theory, and criticises with great ability both the preceding explanations, and after fully investigating Liebig's theory concludes that it is impossible to accept his explanation. He shows that the theory of Sir H. Davy, that it (gypsum) acts beneficially on those plants which are rich in the salt is so far consistent with the nature of the plants in question, that the artificial grasses being rapid in their growth would require a ready supply of the mineral substances to them; that gypsum would always form a solution of constant strength, being always dissolved to the extent of 1,500 part of water contained in the soil, and would, under any alternations of drought and wet, be ever ready to administer to the necessities of a rapid vegetation. He proves that the quantity of lime absorbed by clover manured with gypsum was out of all proportion larger when compared with sulphuric acid introduced at the same time, and comes to the conclusion that gypsum acts merely as a means of supplying lime to clover and plants of a similar kind. Thus you see how the most learned men differ as to first principles. We may, however, console ourselves with the fact, that, if the cause be mysterious, the effect is as clear as noon-day; and whilst scientific men fight about the first, we try to settle the grand practical points—the time to apply it to the various crops, and, by an expression of opinion, the quantity necessary, and so on.

As regards the time of applying gypsum to clover meadow, my opinion is that in nine cases out of ten it is applied too early: corroborative of this I quote an experiment by Prof. Korte, which must carry considerable weight coming from so high authority and under the tests of *weight* and *measure*. An equal quantity of gypsum was applied on three equal parts of the same field at three distinct times, a fourth part left undressed, the result was proportionally as follows: