ous other animal substances being used to supply the nitrogen in which these materials are deficient. The consequence of this is that the greatest possible differences exist in the composition of this manure, so much so that the product of no two manufactures is exactly alike, and very often owing to variations in the quality and quantity of the different raw materials, dictated of course by economic considerations, samples obtained at different times from the same manufacturer show a remarkable want of uniformity. The difficulty of understanding the analyses is necessarily enhanced by these differences, and still more by the discrepancies which exist in the mode of stating the results used by different individuals, which are very great, and, as I believe, the cause of much misapprehension. In order to render the analysis of a superphosphate intelligible, it is necessary to explain that in the bones and all other similar substances the phosphoric acid is in combination with lime, and the combination is entirely insoluble in water. But there exists another compound of these substances, containing only the third of the lime, which is exceedingly soluble in water, and which is commonly known by the name of biphosphate of lime. When, therefore, two-thirds of the lime is removed from the former, it is converted into the latter, and this is effected by means of sulphuric acid, which, by its superior attraction for lime, withdraws it from the phosphoric acid and forms with it a quantity of sulphate of lime or gypsum. We find also by actual experiment that 100 parts of the ordinary bone phosphate of lime contain 46 of phosphoric acid, and by removal of the lime it is converted into 64 parts of biphosphate of lime, still containing all the phosphoric acid, the difference in weight being due to the abstraction of the valueless lime, which along with sulphuric acid has produced 110 parts of gypsum. By the addition of a proper proportion of acid to bones or any other raw material the whole of the phosphates might be converted into this compound, but practically great difficulties are encountered in doing so, and in the case of raw bones it cannot be accomplished. Nor is this a matter of much moment, because experience has taught us that it is not desirable to do so, but that it is preferable to have a proportion of the phosphates in their original insoluble state. It will be understood from what has been said, that in the act of making the phosphoric acid soluble a quantity of sulphate of lime is produced and it is important to notice this point, because it is very commonly believed by farmers that the sulphate of lime which forms so large a constituent of all superphosphates is deliberately added to them by the manufacturer. This, however, is a mistake. I believe sulphate of lime is very rarely added to a superphosphate, and that the efforts of the manufacturer are devoted to keeping it down as much as possible, because it is well known that a large proportion of it excites suspicion and distrust on the part of the farmer. It has been already said that it is impossible to obtain any great quantity of s phosphate of lime without at the same time ducing 1½ times as much gypsum, but in tice the proportion is generally much larger this, because almost all the raw materials ployed in the manufacture contain a conside quantity of carbonate of lime or chalk, by the action of the acid is also converted sulphate. This is particularly the case wi prolites, and the consequence is that it from uncommon to find the gypsum 2 or 3 as large as the biphosphate.

The learned Professor then referred t valuation of manures; he said—The best m of deducing from the analysis of a man fair estimate of its money value is a pr problem of much importance, which has a ed the attention of many persons and sev these differing in detail though similar in ple, have been contrived. The difficulty attends the contrivance of a system whic be altogether beyond cavil, and on wh persons can be at one, lies in the comp ture of most manures, and the number o ent factors of which their value is made the case of a substance such as sulphate monia or nitrate of soda which has a market price, the value of different sam easily and clearly ascertained, and the de now made for any given amount of imp estimated in a manner which requires n nation. But when a substance is of c constitution and owes its value to severa ent constituents, it is necessary to have rate estimate for each of these, which deduced from the commercial value not particular complex mixture but from other substances of which each of the constituents is met with separately. N happens that the commercial value of substances is not estimated solely by c tions of composition, but questions of and supply and applicability to various have an important influence. Thus, f ple, a coprolite containing about 60 pe phosphates sells for £3 10s. a ton, while phosphatic guano containing the same brings from £6 to £7, in other words, phates in such a guano bring nearly t price they would do in coprolites, and t is obvious: in the one case they are in tion such as to admit of their direct ap to the soil, while in the other they mus dergo an expensive preparation. In way if our inquiry was the price of bon find the value of the phosphates int between that of coprolites and guano we go further and inquire into the mar of different kinds of guano we find tha of the phosphates contained in them d very extraordinary extent. This is d to the fact that the price charged for is estimated commercially at such a r cover the expense of freight and othe and to leave a profit to the dealer, an