

growth. The number of roots on each plot should be counted before weighing the crop. The whole produce of each plot should be weighed roots and leaves separately. If the acre for which the results are calculated is a Scotch or Irish acre, the fact must be mentioned.

Having looked through nearly all the published records of field experiments with dissolved and undissolved phosphates, the writer is sorry to state that in very few instances has even a majority of the particulars above mentioned been included in the report of the experiments; it becomes, impossible, therefore, in many cases to decide whether the results are of value or not.

In looking at the results of a field experiment, we should in the first place see what amount of agreement exists between duplicate plots. It is clear that differences cannot safely be ascribed as due to manure, when they are no greater than the differences between plots in the same field similarly treated. Where the increase obtained from the most effective phosphate is but small, no argument can safely be drawn as to the comparative value of different phosphates; in such a case the soil clearly stood in little need of phosphates, and was unsuited to test their efficacy.

Supposing that the results appear on examination to be free from error, we have next to look at the amount of increase which the several manures have yielded. To regard the mere weight of the crop is most delusive. Thus in Mr Wilson's experiments in Berwickshire, the ground coprolite yielded 21 ton 8 cwt. of turnips, and the coprolite superphosphate 22 ton 19½ cwt.; from these figures we should be inclined to say that there was little difference in the action of the two manures. The plot without manure gave, however, 19 ton 1½ cwt. of roots; so that the produce of the undissolved coprolite was really 46½ cwt., and of the dissolved coprolite 78 cwt., showing thus a decidedly great effect from the latter manure.

Many of the comparisons of dissolved and undissolved phosphates are fallacious, simply because the quantities of phosphate applied have been too large. The size of the crop which can be grown on any field is always limited by the character of the soil and season, and no application of phosphates can force the produce beyond this point. To compare different phosphates with accuracy the quantity of the most active phosphate employed should be rather less than will suffice to produce a maximum crop; it is only when this is done that each of the phosphates is able to display its full effect.

Suppose, for instance, that in a certain field and season 3 cwt. is the largest quantity of superphosphate that can be economically employed for the turnip crop, any excess over this quantity giving no return. If on such a field experiments are started with 5 cwt. of boneash superphosphate, to compare with an equivalent quantity (about 3 cwt.) of undissolved boneash, it is evident at once that the result will be most unfair to the superphosphate. The 3 cwt. of slowly soluble boneash is probably able to display its full effect, while the superphosphate can only show three-fifths of its power. The boneash may thus appear as equal to the superphosphate in manuring effect, without in any way deserving such a character. It should clearly be possible, by employing sufficiently large quantities of the phosphates to be tried, to make them all yield an equal result. The same equality of result might also be brought about by a season of little growth, in which the poorest manure was sufficient for the wants of the crop. A fair comparison can only be obtained when none of the phosphates applied exceeds the wants of the crop.

The quantity of superphosphate applied to turnips is often very excessive; farmers seldom take the pains to ascertain by actual trial what quantity will give the most econo-

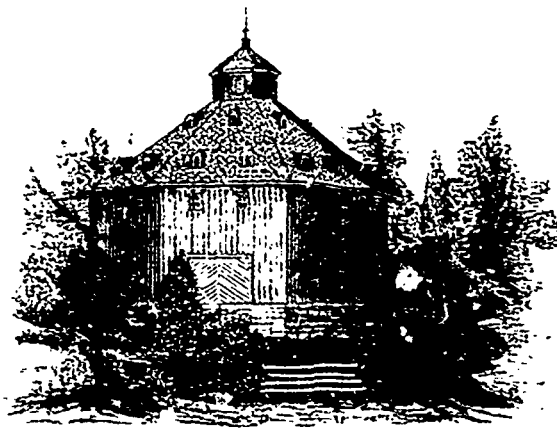
mical result, but go on blindly employing the same dressing they have been accustomed to. In Mr Vallentine's experiments, just published, 3 cwt. of superphosphate yielded an increase of 2 ton of swedes, while 6 cwt. of superphosphate gave 2 ton 7 cwt. In the experiments conducted by the Cirencester Chamber of Agriculture some years ago, it appeared that 3 cwt. of superphosphate drilled with the seed was as much as could be economically given; this amount produced on an average an increase of about 5¼ ton of swedes. When we recollect that 3 cwt. of ordinary superphosphate will contain about 49 lb of phosphoric acid, of which 38 lb. will exist as soluble phosphate, while 5 ton of swedes will contain in root and leaf about 8 lb of phosphoric acid, we shall readily believe that the quantity of superphosphate just named is amply sufficient to produce a still larger increase in the swede crop when soil and season are favourable.

The use of extravagantly large amounts of phosphate is probably the chief cause of the near agreement between the results yielded by dissolved and undissolved phosphates in some of the published experiments. Some of the results are truly ridiculous. The Rochester Farmer's Club actually applied 9 cwt. of coprolite superphosphate per acre, and obtained an increase by this treatment of only 2 ton of turnips, including tops! Let us hope that the farmers of this district do not usually employ manure in this wasteful fashion.

In all future experiments we would strongly advise the use of smaller quantities of phosphate. Let 3 cwt. of superphosphate, rather than 5 cwt., become the unit on which experiments are planned. If this is done, the economy of using dissolved phosphates will, we believe, be placed beyond doubt in a great majority of cases.—R. WARINGTON.

### OCTAGONAL BARN.

We published some years ago, in the eighth volume of *RURAL AFFAIRS*, the plan and description of an octagonal barn, furnished by E. W. Stewart of Erie county, N. Y., from buildings of his own construction. Much interest has been felt in relation to their success, and further information is desired. Mr. Stewart now informs us that this form of barn has been very satisfactory to him, and that some 30 or 40



OCTAGON CATTLE-BARN.

have been built in various parts of the country—among them five in Pennsylvania, three in Indiana, four or five in Illinois, two in Minnesota, and several in Kentucky. We give briefly the substance of the description, in connection with the plans. The perspective view furnishes a good idea of the general form.