beneficial. In the discussion of fermentation of tarmyard manure, the conditions favoring denitrification were described, and it will be seen that the German conditions were particularly suitable for denitrification. From the German results a useful practical lesson is to be derived. They show that it is possible to apply farmyard manure in such a manner that its effect is positively injurious; and though it is extremely improbable that such conditions would exist in farm practice, it is more than probable that large losses of nitrogen through denitrification frequently occur when very heavy applications of farmyard manure are made. When the soil is not well drained, the danger of denitrification is increased.

It is a difficult matter to say what constitutes a light, moderate, or heavy application of farmyard manure. It has been shown that farmyard manure is subject to extreme variations in composition; consequently a given number of tons per acre might be a heavy dressing of manure in one case and a light dressing in another, depending on the quality of the manure. The rate of application will also be influenced by the natural fertility of the soil and the kind of crop to be grown, so that recommendations as to quantity can be made only in the most general terms, and a good deal must be left to the judgment of the person applying it. Generally speaking, about fifteen tons per acre of good manure from an outside yard may be counted a fairly heavy dressing for average soils. Well managed manure from a covered yard or shed contains less water than that from outside yards, and consequently a smaller quantity would be equivalent to fifteen tons of outside manure. Now, mixed farmyard manure of fairly good quality may contain .6 per cent. of nitrogen, .3 per cent. of phosphorio acid, and .45 per cent. of potash, though of course these percentages are merely approximations. The following table shows the amount of nitrogen, phosphoric acid, and potash supplied by fifteen tons of farmyard manure according to the percentages given above, together with the amount of these constituents removed per acre by a crop of wheat and turnips, as estimated by Van Slyke :

	Nitrogen.	Phosphoric Acid.	Potash.
15 tons farmyard manure contain Wheat crop (15 to 30 bushels) contains	180 lbs. 31 to 62 lbs.	90 lbs. 10 to 20 lbs.	135 lbs. 13 to 26 lbs.
Turnip crop (350 to 700 bushels) contains	40 to 80 lbs.	26 to 52 lbs.	90 to 180 lbs.

According to the estimates just quoted, fifteen tons of farmyard manure supplies an excess of all the fertilizing constituents, except phosphorio acid for the largest crop of turnips. All of the plant food contained in the manure is not available, but it is not known what percentage of the plant food can be made use of by the crop under ordinary field conditions, and probably never will be known owing to the complexity of the problem. In a fertile, well cultivated soil, however, some allowance must be made for available plant food already in the soil, either as a residue from previous manuring or as natural fertility, so that it is not necessary to supply in an available form the full amount of plant food required by the crop. It is quite probable, too, that average farmyard

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Time of sown crops if This is the ca or a grain cr in the fall give tains. The o for keeping r grave objectio show that ver Sheldon, of t hauled to the to nearly fort Experiment S manure was When manure summer, the l ing the summ