heap, either with manure or with lime or wood ashes; or the air-dried muck may be first applied as an absorbent in the cow stable, pig pen, etc., to absorb the liquid manure. In this way a double purpose is served; the valuable liquid portion of the manure which might otherwise be lost is retained, and the fertilizing elements in the muck set free. Good samples of air-dried muck will contain from 65 to 85 per cent. organic matter, and from 1.25 to 2.5 per cent. nitrogen.

Possibly the only feasible plan of furnishing humus and nitrogen over large areas is by the turning under of a growing crop of clover or some other legume. This is termed green manuring, and is certainly to be regarded as the most economical and one of the quickest methods of replenishing the soil's humus. The benefits to be derived from green manuring, especially when a legume is used, have been so repeatedly set forth in our past reports that it may not be necessary to speak at any length on that subject. It is well to emphasize, however, in this connection three points: firstly, if the soil is too poor to grow clover, buckwheat or rye may be ploughed under for a year or two and the land made suitable for clover; secondly, that a dressing of wood ashes or a fertilizer containing potash and phosphoric acid will very much help the clover; and, thirdly, there will be no practical enrichment of the soil with nitrogen unless a legume is used, since the legumes only have the ability (by means of certain germs that reside in the nodules on their roots) to appropriate and store up the free nitrogen of the air.

Lime.

The analytical data show that this soil is by no means rich in lime, and its well-marked acidity accentuates this fact. The land evidently stands in need of lime, not only as a source of plant food, but to correct the sourness which is injurious to most farm crops. Since it is not wise to make heavy applications of lime, and since this element has the tendency to work or wash down into the subsoil out of the reach of the roots, the application of, say, 20 to 30 bushels per acre every second or third year might prove better practice than a larger dressing at greater intervals. If phosphoric acid is applied in the form of basic slag, much less lime than that indicated will be necessary, since that fertilizer contains a considerable proportion (usually 12 to 15 per cent.) of free lime.

Shallow culture, *i. e.*, shallow ploughing, with an occasional loosening, but not bringing to the surface, of the subsoil is to be advised for this and similar soils. It seems desirable, owing to its light and hungry character, to keep the humus, lime and other fertilizers as far as possible in the first four or five inches of soil. A deep tilth is undoubtedly a feature of great value, but it can scarcely be economically produced and retained in very light and sandy soils. For further details as to the economical improvement of poor and exhausted soils, the reader is referred to the Report of this Division for 1899, page 133, *et seq.*

Commercial Fertilizers.

In the question of commercial fertilizers, it will only be possible to indicate the general principles to be followed, since the nature of the crop to be grown and the past history of the field must necessarily be taken into consideration before definite formulæ for any specific purpose can be suggested. The following remarks, however, may be useful:—

Nitrogen.

Of the commercial forms of organic nitrogen in British Columbia, fish waste, prepared from the offal of the canning factories, sometimes known as fish meal, or fish pomace, holds a high place. Its composition will vary according to the parts of the fish that predominate in its preparation; thus, some samples may contain between 2 and 3 per cent. nitrogen and 10 to 15 per cent. phosphoric acid, while others possess 5 to 7 per cent. nitrogen and 2 to 3 per cent. phosphoric acid. This fertilizer, it is obvious, may be used to supply two of the three elements generally necessary, but should be supplemented by a potash manure, such as kainit, muriate of potash or wood ashes.

We may regard it as a concentrated and quick-acting manure, best used as a top dressing or applied to the ploughed land and lightly harrowed in before seeding. It has been applied with success to grain crops and grass lands especially, and gives the greatest returns on light, warm, well-drained loams. For an ordinary dressing, a mixture of 500 lbs. of fish meal and 100 lbs. of muriate of potash per acre is suggested.