Marls containing over 90 per cent of carbonate of lime are frequently found in Canada; others containing varying proportions of clay, sand or organic matter may show as low as 30 per cent of carbonate of lime. Chiefly by reason of the facility with which they may be reduced to a fine powder, marls constitute a very suitable form of carbonate of lime for use in agriculture.

The Agricultural Functions of Lime and its Compounds.

The chief objects of applying lime or carbonate of lime are two: the neutralization of acidity and the improvement of tilth or mechanical condition of soils.

Acidity or Sourness.

Lime and carbonate of lime combine with and neutralize the soil's acids and the excess used renders the soil slightly alkaline, a condition favourable to crop growth.

Wet, low-lying and ill-drained soils are especially apt to become sour. Soils consisting essentially of vegetable organic matter, as mucks and peat loams, are usually, though not invariably, sour. Many light upland soils are slightly acid, presumably by the washing out and leaching away of their original store of carbonate of lime or its withdrawal by many years of cropping.

In all soils, but more especially in sandy and gravelly loams, there is a tendency for the lime compounds to disappear, partly through removal by crops but more particularly by their solution (in water containing carbonic acid) and passage into the strata below the root area.

Method of Testing for Acidity with Litmus Paper.

The usual test for soil acidity is blue litmus paper, which may be purchased at any drug store. It should be kept in a clean, dry, preferably wide-mouthed, well-corked bottle. When tearing or cutting off a strip of litmus paper for use, a pair of forceps or scissors should be used, as the paper is sensitive and the fingers may cause its reddening. The following test, if carefully carried out, is reliable:—

1. Take up, by means of a spade or trowel, a little of the surface soil from, say, half a dozen places on the area to be examined and mix well; do not handle the soil. Take a small quantity (a few ounces) of the sample, put it in a clean cup or tumbler, pour on a little boiled water and stir with a clean piece of stick or spoon until a pasty mass is obtained. Into this "mud" press, by means of a small stick or the back of a knife, a strip of blue litmus paper for about one-half to two-thirds of its length. If on drawing out the paper, at the end of fifteen minutes, the part in contact with the soil has turned red, then the soil is acid.

Influence of Lime on Tilth.

The influence of lime and its compounds upon the tilth or texture of the soil is most marked in the case of clays, which it renders less sticky and cohesive when wet, and more friable and mellow when dry. On light soils—sandy and gravelly loams—lime and carbonate of lime exert a beneficial influence, their action being to cement slightly the soil particles, rendering the soils somewhat heavier and more compact in texture and, thus, less liable to dry out in seasons of drought.

Chemical Effects of Lime Compounds.

In addition to their beneficial effects already described, lime, as also the carbonate and sulphate of lime, possesses in a considerable degree the power to decompose the insoluble potash compounds in the soil, the lime taking the place of the potash, which is liberated in a form assimilable by plants. **Thus the lime compounds may act as indirect potash fertilizers.** The effect is naturally most noticeable on clays and will most materially benefit clover and other leguminous crops which more particularly respond to potassic fertilizers.