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The fourth is a good rich soil, though a little low in lime. Nos. 5, 6 and 7 are soils of average fertility, somewhat deficient in lime.

Geological Fertilizers.—Continual cropping slowly removes from the soil the mineral ingredients on which its fertility depends. True, in good farming, a portion of these are returned in the manure, but every bushel of grain and every animal that leaves the farm carries with it some of the original phosphoric acid and potash. It is of the highest importance that these be returned to the soil in some cheap and efficacious way. A number of mineral substances are found, which either native or after chemical treatment are available for this purpose.

Apatite, the geological occurrence of which has been described in an earlier chapter, is an important source of phosphoric acid. Treated with sulfuric acid it is partially changed to a soluble phosphate. Commercial superphosphates are a mixture of calcium sulfate, calcium phosphate and calcium acid phosphate, the last of which is the valuable ingredient because of its solubility. Phosphates are especially useful as a top dressing for root crops. In connection with nitrogenous fertilizers they are also a benefit to cereals. Guano and green-sand marls are other sources of phosphoric acid, which, however, are not found in Canada.

Nitrogen, the essential fertilizer of the cereals, may be obtained from three sources. Chemical compounds, such as nitrate of soda and sulfate of ammonia, are very useful because of their solubility, but they are

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