nor the quantity of the phosphates are so easily or so cheaply obtained, on account of the war. These phosphates have only in very small part been taken off the land in the shape of crops or stock, and they have not been leached out of the soil, as that is impossible. There is only one explanation of the disappearance of the effect of the phosphate after a few months which renders it necessary to apply a fresh dose, and that is undoubtedly that the phosphate is changing in its character from an available to a less available form. Is there any way in which this change can be prevented and the full effect of the whole phosphate as applied by the farmer obtained in crop or stock ?

In the writer's article in the *Journal* for April, 1914, he stated, " Probably the most important function of carbonate of lime on New Zealand soils (especially those deficient in phosphates), which are usually well supplied with nitrogen and potash and are not too difficult to work,* lies in the favourable influence which a good supply of carbonate of lime exerts both on the phosphates naturally present in the soil and on those which are artificially added ; for in the first place it decomposes the phosphates of iron and alumina, which are with difficulty available as plant-food, with the formation of calcium phosphates, which are easily available ; and, further, if acid phosphates such as superphosphate are applied, lime prevents the formation of the unavailable phosphates."

The great American soil chemist, Hilgard (see *Journal* just quoted), pointed out long ago that where carbonate of lime was in excess phosphates might be present in very small amount, and yet more satisfactory returns be obtained from the land than when the converse was the case.

In New Zealand there is a great dearth of phosphate deposits, but an abundance of limestone—soft and hard—also of water-power. The inauguration of a comprehensive water-power scheme for the Dominion by cheapening the cost of grinding limestone will enable larger quantities to be used and thereby render less phosphates necessary. The utilization of hydro-electric power for grinding limestone was suggested by the writer some years ago (see *Journal* for November, 1915, p. 393).

It also seems plausible to predict that with the advent of cheap hydro-electric power in districts where the roads are good—and the roads may be improved by similar methods—electric traction will play a part in cheapening limestone to the farmer; that by the employment of electrically driven lorries provided with suitable distributing apparatus the ground limestone may be delivered from the works to the fields in one operation, thus eliminating the present great cost of handling, bagging, and railage.

* In a heavy clay soil difficult to work probably quicklime would be more economical to use than ground limestone in the first instance.

Elephant-grass.—Very favourable reports having been received as to the immense amount of fodder produced by this plant (also named " Napier's Fodder-grass "), the Department has obtained a supply of roots from the Grafton Experimental Station, New South Wales, through the courtesy of the Director of Agriculture of that State. The grass will be tested at Ruakura and at the Albany experimental plots.