

SOIL FERTILITY

(Written for "The Listener" by DR. MURIEL BELL, Nutritionist to the Health Department).

WE have been examining the deficiencies of our soils in respect to the two key minerals, calcium and phosphate. We might even have taken a wider sweep, and found that the factor largely responsible for the limited fish supply in our surrounding ocean is the small content of phosphate for supporting the plant life on which the fishes ultimately depend for their subsistence.

In these days when food production is of paramount importance, we shall do well to touch on other aspects of soil fertility. There are several reasons why New Zealand soils are lacking in phosphate, among them being a relatively poor initial content, their removal by cropping (for example, cereal grains are rich in phosphate), by livestock, by leaching and by soil erosion. We are not alone in this phosphate defect; in South Africa, for instance, animals fed on areas where the phosphate content is particularly low, developed diseases which could be corrected only by supplying more phosphate in the ration. Among the features of phosphate deficiency is lowered milk production.

Depleting influences are at work in many civilised countries. Even of a country like China where so much is returned to the soil, we read an authoritative statement recently in our papers to the effect that "the land gradually became impoverished until in recent years about half the population of China was living in the Yangtse-kiang basin."

We must realise the benefits of adding humus to the soil — by digging in crop residues, refuse and green manure, or by proper preparation of compost; for humus is an important way of conserving mineral matter, holding it against the washing effect of rainfall, and it is an important way of retaining the moisture content of the soil, and of promoting warmth in the ground.

We must also take account of the interdependence of man and animals. In illustration of this point, an experiment over a nine-year-period showed that a crop was doubled after fertilisers were applied — they included lime, phosphate and nitrogenous fertilisers—but the crop was multiplied by five when sheep were grazed on it in addition to the application of fertilisers. Animals thus contribute appreciably to the fertility of the soil. For a classic account of this, told in beautiful language, read Guthrie Smith's *Tutira*.

Nature Provides Safeguards

Do not be worried by the claims of those who say that fertilisers will poison your ground and your crops. Failure to use the right amounts of lime and phosphate in addition to compost must inevitably result in the production of poor quality foods.

Now lest you are anxious as to whether we ourselves are likely to suffer from deficiencies of phosphate and of calcium through these deficiencies in our soils, let me assure you that, as long as we have the animals to act as our intermediaries, we are safeguarded.

Nature keeps the composition of milk nearly constant within certain limits. In phosphate-deficient areas, the total yield of milk suffers, but the phosphate and lime content of the milk remain much the same. The cow thus becomes a line of defence between us and our soil deficiencies—if we give her the opportunity of doing so by using her milk in generous amounts.

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