Nutritional Gardening Department

The Natural Way to Grow Vegetables — Fruits — Flowers

HIDDEN IDEAS IN UNOPENED BOOKS

Magnesium . . .

Its Relation to Calcium in Body Tissues

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Part 4

In a previous discussion (*LET'S LIVE, Vol. 33, No. 2*), we considered the disturbed interrelations of magnesium and calcium in the fluid around the nerves as a causal agent in the nerve breakdown called "tetany." This deduction seems to be a logical one when membranes, or cell walls, of plant roots undergo changes disrupting the plant's nutrition because their contact with the soil's moist clay is exchanging to them erratic amounts of calcium and magnesium. This is a plant's deviation from its normal physiology. It duplicates what is considered a parallel case of the nerve disturbance (tetany) in a warm-blooded body.

Experiments with varied degrees of saturation by magnesium and calcium on the clay have shown corresponding variations in nutrition and healthy functions of legume plants. The intake of cations gave normal, protein-rich growth, and generous nitrogen-fixation. The absence of the latter produced an erratic, mainly carbonaceous plant-growth, during which there was a reverse movement of the inorganic nutrients from the plant to the soil.

Indicates disruption

This latter indicates clearly a serious disruption in the structural properties and physicochemical functions of the root's cell walls, not only of the root hairs, but also of the successive cell layers from these hairs to the root interior. It suggests a breakdown in the unique function of the layers of root cells when, as normal, interface membranes—in contact and exchange with adsorbed nutrient elements on the clay—they "control" the intake and outgo of essentials for the healthy growth of plants.

Apparently the aforesaid breakdown occurs because of either insufficient calcium or excess of magnesium and other cations replacing the calcium in the cell walls where their microfibrillar structure of cellulose is cross-tied by calcium.[1] The clay as a colloid, matched against the root colloid, has been shown an able competitor for holding cations against the latter's taking or removing them, and vice versa.[2] Hence, we might expect the disturbance of the calcium in the cell wall to be causally related to the latter's control when we say "the 'semipermeable' membrane of the root determines the exchanges through it."

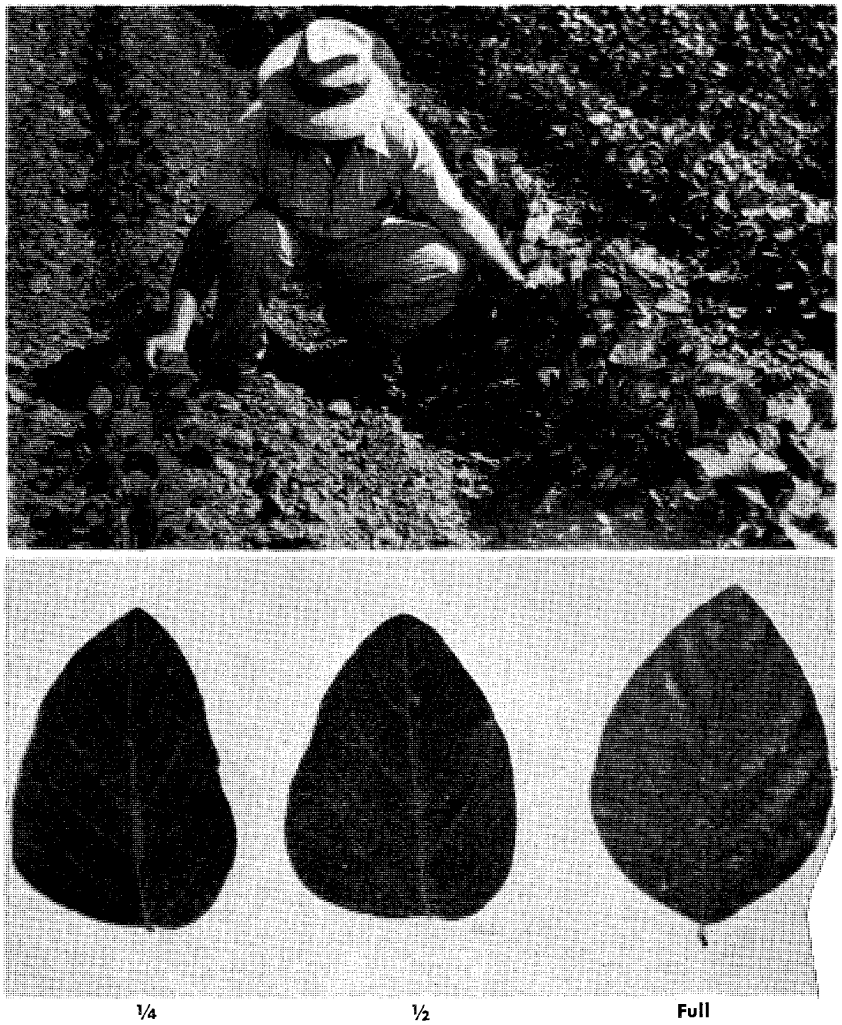
Like nerve disturbances

Irregularities in the plant because of irregularities in exchanges of calcium and magnesium with the clay colloid seem very similar to the upsets of nerves due to similar deficiencies and imbalances of those cations in the fluids bathing these bits of impulse-transmitting body tissue.

Since the degeneration of health can be traced to the disruption of the physicochemical functions in the walls and other parts of cells, and since performances of these minute body portions are biochemically so similar, regardless of whether they be cells of plants or of warmblooded bodies, it will be of interest here to give attention to calcium and magnesium in relation to at least one membrane of the human body.

Intestinal changes

For theoretical consideration, there are the suggested modifications in the intestinal wall—closely similar to those in the walls of the plant root—when magnesium sulfate is used as a purgative. Shall we not envision this excessive magnesium as displacing the calcium in the cellular wall structure of the intestines to disrupt their power of controlling intake and outgo? Should we not expect, then, their allowing the larger amounts of water and other liquids or substances from the blood stream to be the flushing agency? Then, should we not expect the duration of the purge to be no longer than the time required for the blood stream to absorb the magnesium from the cells of the intestinal wall and replace it with calcium to restore the normal physicochemical control against excessive losses



PLANT STUDIES REVEAL DEFICIENCIES . . . Less green in the leaves reveals magnesium shortage. Magnesium is known to be part of the chlorophyl, the green coloring matter present in all growing plants.

of liquids and other matters from the blood to the intestinal canal?

The sudden drain on the blood's low supply of calcium, which prevails in certain kinds of arthritis, may be so dangerous that one dare not consider Epsom salts as a purge in such cases. An extended purge by dripping magnesium salts, used for dehydration in preparation for brain surgery, may put excessive magnesium into the blood stream to threaten the patient with coma. In view of these facts it is evident that the intestinal wall must be undergoing a change in its membranous structure with consequent breakdown where calcium is replaced by magnesium, and then vice versa for recovery.

Appreciation lagging

We are slow in coming to appreciate the significance of "deficiencies" and "imbalances" in the soil-borne inorganic elements which may cause irregularities in our bodies, as they do in the soil, in its microbes, and in the plants. All these struggle to be healthy and to maintain self-protection; but their biochemistry can manage only what is possible within the limits their environment provides. Numerous degenerations of body functions suggest similarity in cellular principles which are common not only to man and his animals, but also to life strata still lower, namely, plants and microbes.

Using the soil as in a mining operation, rather than managing it as nutrition for microbes and plants dependent on organic matter as well as minerals for their foods will finally bring us to recognize degenerations based on the failing creative capacity, that is the fertility, of our soils.

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[1] R. D. Preston, "Structural Plant Polysaccharides," *Endeavor*, XXIII, 153-159 (No. 90), Sept., 1964.
[2] William A. Albrecht, "Some Soil Factors in Nitrogen Fixation by Legumes," *Trans. Third Com. Internat'l Soc. Soil Science*, Vol. A, 71-84, U.S.A., 1939. ◆