NORMAL MAGNESIUM CARBONATE IN COMPARISON WITH
“LIGHT” AND “HEAVY” OXIDES AND CARBONATES
IN THE SOIL

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Many comparisons have been made between the effects of precipitated carbonates of calcium and magnesium in soil. In such comparisons the hydrated carbonate of magnesium, 3 MgCO$_3$.Mg(OH)$_2$.3H$_2$O, has been most frequently used. Basic, or precipitated, magnesium carbonate is to be had in the two forms, “light” and “heavy”. These two materials possess distinctive physical properties. Moreover, when the “light” and “heavy” types of carbonates are “calcined” they yield the “light” and “heavy” oxides. No published comparison of these four forms is to be found. There are also two crystalline, hydroxide-free, carbonates that have not been used in any soil studies known to us.

In certain previous outdoor lysimeter experiments, relative to the silication of calcium and magnesium, excessive quantities of seven liming materials were added. From computations made some years later to obtain a balance between the outgo and the residue of precipitated magnesium carbonate, it appeared that the MgCO$_3$.Mg(OH)$_2$ relationship in the unabsorbed and unleached excess was close to that which existed in the added precipitated carbonate, in spite of its extended contact with carbonated-water solutions that had removed large quantities of magnesium bicarbonate in the leachings. An adjunct lysimeter project was therefore inaugurated for the further study of the outgo and the fixation of magnesium from five oxides and carbonates.

This paper deals with the variations in chemical and biochemical activities induced by the several materials and with the balance found between additions and outgo at the end of a 4-year period. The problem of the nature of the fixation processes and products will be considered separately.

EXPERIMENTAL

A brown loam soil of the Hagerstown series was used without subsoil in nine 1/20,000-acre tanks. The soil had been in sod for a long period of years. This fact is reflected in the larger amounts of bases that were leached, in comparison with the losses found for the same

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