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Review

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A soil leached with a solution of a sodium salt and then subsequently with distilled water shows a very greatly reduced permeability. The percolate also becomes alkaline. The effect can be eliminated and the soil rendered again permeable by leaching with a solution of calcium or aluminium salts. Aluminium is much more effective in "softening" and the effects continue even after continued leaching with pure water.

The theory suggested to explain these phenomena is that the sodium replaces bases on the surface of the soil particles and becomes combined, at any rate in part, as sodium silicate which forms a hydrogel. Hence the effects on drying. With calcium and aluminium on the other hand colloid gels are not formed and sodium silicate gels present are masked by the formation of an insoluble precipitate of calcium or aluminium. With calcium and aluminium other bases are set free in solution.

From this it is seen that the quality of irrigation water is not to be judged by total salts present or by their acid radicals but by the proportion of sodium to calcium and magnesium. Where the sodium is greater in amount hardness is to be feared or tersely "soft water gives hard soils and hard water soft soils."

Examination of some important supplies of irrigation water showed that the amount of sodium was greater than that of calcium and in the regions supplied from these "hardness" in soils was increasing. The remedy lies in supplying calcium salts either to the land or to the water supply.

FOREST AND PRAIRIE

Vestal, A. G. "Local inclusions of prairie within forest." *Trans. Illinois State Academy of Science*, **11**, 1918, pp. 122.

Vestal calls attention to, and illustrates by a chart and photographs, the occurrence of typical prairie communities within the forest region of eastern Illinois on and near the crests of the slopes of valleys and ravines which have a S., S.W. or W. aspect, where the soil is consequently too dry for forest owing to exposure to the drying winds from these quarters. Such islands of prairie maintain themselves for a considerable time but are subject to invasion by forest, which progresses from below upwards owing to the shade cast on the edge of the prairie patch by the trees below. Where other factors, such as instability of surface owing to steepness of slope, cooperate, the forest is apparently unable to invade. It is suggested that such physiographic entities should be called *upland salients* or *spur tops*.

Vestal, A. G. "Invasion of forest land by prairie along railroads." *Ibid.* pp. 126.

Where railroads have been cut through forest land in the immediate neighbourhood of prairie, the sides of the "right of way" are invaded partly by prairie and partly by forest. The latter is represented by forest shrubs and herbs only because the trees are not allowed to grow up. The former is favoured by coarse, well-drained soil, considerable exposure to wind and sun, drought during the critical seasons of establishment, and, of course, burning and mowing. The opposite conditions favour the re-establishment of forest.