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tended, and the effect for a given time lessened, because it is slow to dissolve; hence, in dry weather, it is inactive. What adds to this is its place in the soil, at the surface, where the drying winds have a direct effect upon it. To apply it in the spring, with a dry season to follow, is to get comparatively little effect from even the best brand, if left exposed at the surface. We see this where applied to grass lands, or fields sowed to grain and left uncovered, thus exposing it more directly than where the grass shades it. To pass judgment upon it under these circumstances, without making due allowance, is to condemn what may be a good article and adapted to the soil.

To pass the harrow over it on sowed ground is a help: to harrow still more is a greater help; to pass the cultivator over lightly is the best of all. This gives it moisture and darkness. It is for this reason that drilled in with the grain, it has a better effect than if sown broadcast, or scattered along on the surface of the drill. It is perfectly safe an inch or two, or even more, in the ground; better, if well distributed or mixed with the soil to that distance. If applied on grass and given a coat of fine earth, say half an inch thick, the effect will be wonderful on land that requires it. I have tested it with road dust well charged with horse dung, with good surface soil, and with raw earth that was worthless. There was some difference in favor of the road dust, no doubt on account of its dung; and its finer reduction making it more compact. But the raw earth did finely, and the effect where covered was maintained more or less during a drouth. I know, from former careful experiment, that a coat of earth, or sand, or even gravel, will thicken the grass for awhile without phosphate, or any other manure.

In my experiments with reduced bone I have made due allowance for the effect of the covering. In the one case it lasts less than the season through, if applied early; in the other it extends to the third season, and longer if coarse-grained. Covering may in a measure be done with the harrow where

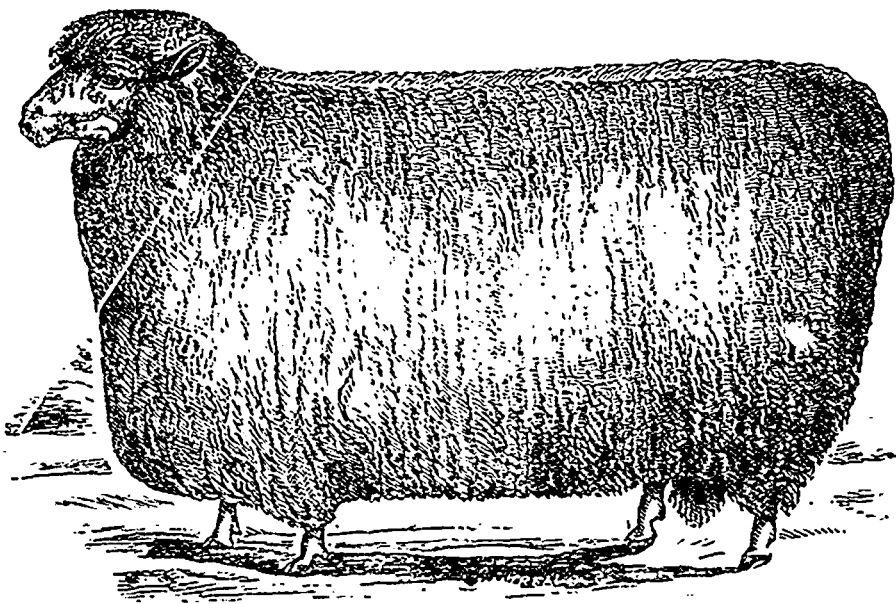
grass lands are somewhat run out and the soil favors phosphate. This should be done in the fall or early spring. When not followed by the harrow on grass lands this fertilizer should always be applied in the fall so as to get the benefit of the frost acting on the soil, burying it, the moisture also dissolving it to some extent, which favors an early start of the grass. It probably would be an advantage also on plowed ground intended for a spring crop, harrowing before the phosphate is applied. In using this manure, the aim should always be to

secure moisture and exclusion of light; and the two are obtained by covering it.

From all this and more that might be said, is it a wonder that we should hear of complaint about this manure? And is it not clear that much of this is unjust? A fair test has not been made. I am inclined to think the phosphates are adapted to more soils than they generally get credit for. Those who use them with little or no apparent effect at first—drouth or exposure the cause—are not apt to carry their observation much further, and so fail to note the future action which may occur, this fertilizer being well known for its extended effect, greater sometimes the second than the first year should a



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drouth chance the first year and moisture the second. We cannot form correct conclusions if we ignore the influence of the weather, even when the phosphate is covered, as drouth easily extends through the thin coat, arresting thus the action of the manure. It is putting it on the surface, exposed to the light and getting the effect of every drying wind, that, to a large extent, gives to this fertilizer the uncertainty it possesses, and in which it differs from other manures. From this it is to be inferred that it is more effective in a moist than a dry