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should be erected clear of the ground, on which the cement is placed and covered to exclude water. When properly protected it often improves with age.

Cement mortar is an intimate mixture of cement and sand mixed with sufficient water to produce a plastic mass. The amount of water will vary according to the proportion and condition of the sand and had best be determined independently in each case. Sand is used both for the sake of economy and to avoid cracks due to shrinkage of cement in setting. Where great strength is required, there should be at least sufficient cement to fill the voids or air spaces in the sand, and a slight excess is preferable in order to compensate for any uneven distribution in the mixing. Common proportions for Portland cement mortar are three parts sand to one of cement. Unless otherwise stated, materials for mortar or concrete are considered to be proportioned by volume, the cement being lightly shaken in the measure used.

A "lean" mortar is one having only a small proportion of cement, while a "rich" mixture is one with a large proportion of cement. "Neat" cement is pure cement, or that with no admixture of sand. The term "aggregate" is used to designate the coarse materials entering into concrete—usually gravel or crushed rock. The proportion in which the three elements enter into the mixture is usually expressed by three figures separated by dashes, as for instance, 1—3—5, meaning one part cement, three parts sand and five parts aggregate.

IN TESTING CEMENT.

In the great majority of cases cement mortar is subjected only to compression, and for this reason it would seem natural in testing it to determine its compressive strength. The tensile strength of cement mortar, however, is usually determined and from this its resistance to compression may be assumed to be from eight to twelve times greater. A direct determination of the compressive strength is a less simple operation, for which reason the tensile test is in most cases accepted as indicating the strength of the cement.

In mixing cement mortar it is best to use a platform of convenient size or a shallow box. First, deposit the requisite amount of sand in a uniform layer, and on top of this spread the cement. These should be mixed dry with shovels or hoes, until the whole mass exhibits a uniform color. Next, form a crater of the dry mixture and into this pour nearly the entire quantity of water required for the batch. Work the dry material from the outside toward the center until all the water is taken up, then turn rapidly with shovels, adding water at the same time by sprinkling until the desired consistency is attained. It is frequently specified that the mortar shall be turned a certain number of times, but a better practice for securing a uniform mixture is to watch the operation and judge by the eye when the mixture has been carried far enough. In brick masonry the mistake is frequently made of mixing the mortar very wet and relying upon the bricks to absorb the excess of water. It is better, however, to wet the bricks thoroughly and use a stiff mortar.

The term "grout" is applied to mortar mixed with an excess of water, which gives it about the consistency of cream. This material is often used to fill the voids in stone masonry, and in brick work the inner portions of walls are frequently laid dry and grouted. The practice in either case is to be condemned, except where the conditions are unusual, as cement used in this way will never develop its full strength.

TEN PER CENT REPLACED BY LIME.

L. C. Sabin finds that in a Portland cement mortar containing three parts sand to one of cement, 10 per cent. of the cement may be replaced by lime in the form of paste without diminishing the strength of the mortar and at the same time rendering it more plastic. In the case of natural cement mortar lime may be added to the extent of 20 to 25 per cent. with good results. The increased plasticity due to the addition of lime much facilitates the operation of laying bricks, and has caused lime and cement mortar to become largely used.

In plastering with cement a few precautions must be observed to insure good and permanent results. The surface to receive the plaster should be rough, perfectly clean and well saturated with water. A mortar very rich in cement is rather a drawback than otherwise on account of shrinkage cracks, which frequently appear. The mortar, consisting of two to three parts sand to one of cement, should be mixed with as little water as pos-



AN EARLY MORNING SCENE.
On the farm of W. Poole, Sidney, Man.

sible and well worked to produce plasticity. It is essential that the plaster be kept moist until it has thoroughly hardened.

In coloring cement work the best results are obtained by the use of mineral pigments. The coloring matter, in proportions depending upon the desired shade, should be thoroughly mixed with the dry cement before making the mortar. By preparing small specimens of the mortar and noting the color after drying the proportions may be determined.

For gray or black, use lampblack.
For yellow or buff, use yellow ochre.
For brown, use umber.
For red, use venetian red.
For blue, use ultramarine.

Opinions on Treating for Smut.

A correspondent, W. D. Chase of Roche Piercée, in Saskatchewan, writes regarding the treatment of seed grain to prevent smut and thinks that much of the smut in last year's crop was due to lack of thoroughness in treating the seed. He does not believe it is possible to secure perfect immunity by sprinkling. His method is to use one pound of 40 per cent. formalin to 40 gallons of water and to put the grain in coarse sacks, immerse for about five minutes and let it drain back into the tub or barrel. After treating this way, the grain is spread upon the floor or in a wagon box and shoveled over, then spread out to dry. Mr. Chase has treated seed this way for several years and finds it gives perfect immunity.

Another correspondent, Mr. D. G. Lowe writes: No matter how clean a sample of wheat is, it should be well treated with bluestone or formalin and in justice to the people who sell these, I would say that I think the way the work is done, most farmers are at fault, as much as the quality of the bluestone or formalin. I have raised wheat for sale for thirty years or more, and I have treated my wheat for about twenty years. Sprinkling the wheat is not to my mind a sure way of doing, and those sprinkling machines do not give time enough to moisten or thoroughly wet the wheat with the pickle. I never had an objection raised for smut in all my wheat raising yet, and the way I do, I fill a coal oil barrel three-fourths full of bluestone pickle, I then put the seed wheat or other grain into Gunney sacks and then put the sacks into the barrel. I leave them in the pickle for a couple of minutes then draw out the sack and place it on a broad board fitted on the top of the barrel with enough slant to drain the pickle back again. Then I empty the sack on the granary floor and in half a day it is ready for the seed-er. I am then quite sure that I have done my best. I have sprinkled some but could always find an odd head of smut after such a plan.

Another farmer at Oak Bluff, Man., writes describing his method of treating wheat. His plan is to have holes in the bottom of a barrel, cover with a wire screen, place the barrel on a sloping stand so that a tub can be slipped under to catch the solution. He then fills the barrel with wheat and pours in about ten gallons of bluestone solution. In about two minutes it has run through and the grain can be dumped out. Refill the barrel and use the same solution. Our correspondent says this is convenient and economical of bluestone solution.

Order point and sample market is bound to come.—President E. N. Hopkins, Moose Jaw.

Horticulture and Forestry

Stray Shots on Forestry.

Mr. A. E. Keffer a prominent farmer in the Lethbridge country is doing good work in tree planting. He has set out one hundred apple trees and between fifty and sixty cherry and plum trees. "How do you think they will do?" he was asked recently. "I am quite confident of results," replied Mr. Keffer. "They have been a success experimentally and certainly there should be profit in the business at prevailing prices."

* * *

Lethbridge has on hand a tree planting scheme that will make the streets of the southern town look like a young forest. In the very center of the city there is a large park. Heretofore, this has been used for an athletic ground, but an unfenced park is a poor place for collecting admission fees and so the athletic society has gone elsewhere for more suitable quarters and the city will now take steps to maintain a first-class arbor-etum. Speaking of the work to be done Mr. Magrath, Land Commissioner for the Alberta Railway and Irrigation Co., said: "Tree lined streets would be the best advertisement our town could have. I would favor the idea of employing several men for this work and believe that the expense should be borne in the same way as other local improvements. I am speaking as a property holder in this town and I think all vacant lots should bear a share of the cost". This idea will probably be acted upon.

* * *

Arch. Mitchell, the indefatigable exponent of the gospel of forestry, has great faith in the possibilities of tree planting in Alberta. He has seen the work successfully done in almost every section of the province and says that given the "know how" magnificent plantations can be grown on any farm in the west. "Why," said Mr. Mitchell, "they are growing trees on shifting sea sand on Sable Island and on the coasts of France, surely they should succeed in a farmer's garden."

How do you account for the absence of trees in the south when the northern portion of the province is so well covered? "Fires," answered Mr. Mitchell. "The tree line at present extends to Olds on the Calgary and Edmonton line. South of that you have warmer winters due to Chinook winds which carry away the snow. In consequence, in the olden days there were more prairie fires in the south and that accounts for the scarcity of trees. Since the land has been occupied the fires have ceased and the tree line is extending southward. Some have claimed that the Chinook winds killed the trees by drying out in winter, but this is all nonsense. I have seen trees growing on the most exposed knolls while richer ground on the lower slopes was bare. The knolls were stone covered instead of being grassy; fires would not travel and in consequence the trees got the start."

This coming season is the time to prepare the land for next year's tree planting; the government is giving every possible assistance; the people are interested and the next few years will certainly see a mighty change in the aspect of the South Alberta Country.