Mr. Howard's report was very gratifying. Finding it impracticable to jar them from the vines into sheets or other receptacles, and keep them there, he hit upon the plan of drenching the sheets with kerosene; this worked in a most satisfactory manner. The mode of procedure is as follows: Take two pieces of common cotton sheeting, each being two yards long and half as wide; fasten sticks across the ends of each piece to keep the cloth open, and then drench with kerosene. Give the sheets thus prepared to two persons, each having hold of the rods at opposite ends of the sheets. Then let these persons pass one sheet on either side of the vine, being careful to unite the cloth around the base of the vine; then let a third person give the stake to which the vine is attached a sharp blow with a heavy stick. Such a blow will in nearly every case jar the beetles into the sheets, where the kerosene kills them almost instantly.

This process, after a little experience, can be performed almost as rapidly as the persons employed can walk from one vine to another. The expense necessary is very trifling, and boys can do the work quite as well as men. Warm bright afternoons are the proper times for this work to be done, and it should be performed faithfully every sunny day until the vines are out of danger. This mode of combating the beetle promises to be much more effectual than any other which has been hitherto suggested; for it can be used early in the season before the vines are seriously injured and before the insects have begun to multiply. In connection with the above, the remedies which have been recommended often should, if necessary, be used. These are as follows: First, all rubbish should be removed from the vineyard, and the stakes and trellises which support the vines be well cleaned of bark and splinters, so as to afford the beetles little chance for hibernating in the vineyard. Second, if the larvæ appear in great numbers, lime should be sifted over the vines.

Protection Against Mosquitoes and Flies.

Quassia water is, according to a correspondent of *Nature*, a protection to peach trees against insect blight. The first year the trees bore well and the new wood was elbow length or more. I next tried quassia in the vinery. Instead of lime-washing the walls to get rid of the green fly, one watering with quassia dismissed them in a day. My head gardener, who had previously much experience in nursery grounds, wondered that he had never heard of it before. He now uses it in all cases as a protection from flies and blight. The dilution goes a long way: one pound of chips of quassia wood boiled and reboiled in other water until he has eight gallons of the extract for his garden engine. He finds it inadvisable to use it stronger for some plants. This boiling makes the quassia adhesive, and being principally applied to the underleaf, because most blight settles there, it is not readily washed off by rain. Quassia is used in medicine as a powerful tonic, and the chips are sold by chemists at from sixpence to a shilling a pound. The tree is indigenous to the West Indies and to South America.

And now as to gnats and mosquitoes. A young friend of mine, severely bitten by mosquitoes and unwilling to be seen so disfigured, sent for quassia chips and had boiling water poured upon them. At night, after washing, she dipped her hands into the quassia water and left it to dry on her face. This was a perfect protection, and continued to be so whenever applied.

At the approach of winter, when flies and gnats get into houses and sometimes bite venomously, a grandchild of mine, eighteen months old, was thus attacked. I gave the nurse some of my weak solution of quassia to be left to dry on his face, and he was not bitten again. It is innocuous to children, and it may be a protection also against bed insects, which I have not had the opportunity of trying. When the solution of quassia is strong it is well known to be an active fly poison, and is mixed with sugar to attract flies, but this is not strong enough to kill at once.

ENGINEERING INVENTIONS.

Mr. Richard B. Ireland, of Trenton, N. J., has recently patented an improved railway signal, in which the sliding night signals carry corresponding day signal arms or banners of different configurations and color, the danger slide being elevated by raising either of the other slides (caution or safety), their normal condition being, of course, danger.

Mr. John R. Jones, of Clarkesville, Iowa, has recently patented an ingenious and effective device for operating car brakes. It may be operated either by hand or by means of a friction wheel fitted on the locomotive. It gives a simultaneous movement to all of the brakes on the train.

Mr. Eugene H. Angamar, of New Orleans, La., has invented a boiler adapted for application to horse cars now in use, so as to utilize such horse cars without material changes. The invention consists in a boiler made in two portions, separated by a mediate chamber, the water and steam spaces of the parts being connected by pipes.

An improved slate dressing machine, patented by Mr. Francis Shenton, of Slatington, Pa., consists of angularly set vertically moving knives for beveling and trimming the end edges of the slates, and, in connection therewith, grooves and ways and other devices for holding the slate in its proper position for the action of the knives, and an arrangement for holding the knives in position to act upon the edges at the proper moment.

THE ARMY WORM ON LONG ISLAND.—The army worm has appeared in great numbers at Islip, Long Island, and is naturally creating much alarm among the farmers.

ROOFED COUNTRY ROADS.

To a large extent in the South and Southwest the highways are of two distinct sorts—in local parlance, *turnpikes* and *mud roads*.

The former title covers the main State roads, often constructed with great care and cost, and usually macadamized. The latter includes the great majority of country roads; and for nine months or more every year the name is exactly descriptive of their character. They are emphatically mud roads, and the mud is deep and tenacious.

Plank roads are sometimes tried where lumber is cheap; but they rest under the disadvantage of being expensive, and they are neither durable nor easily kept in repair. Accordingly mud roads predominate, and the communities possessing them are little given to social or commercial intercourse with their neighbors save during the brief periods when the mud is dry and the wheeling passably good.

An exception to this rule appears in Bosier Parish, Louisiana, where an attempt has been made to keep an important earth road dry and usable by the novel device of roofing it, so as to keep off the rain. The first stretch of covered road on this plan runs from Red Chute Bridge, Louisania, four miles across Red River bottom, near Shrieveport. The idea originated with Judge J. D. Watkins, of Shrieveport, and, as is the usual fate of new ideas, it aroused no little popular ridicule. Judge Watkins was not a man to be laughed down. Obtaining a State charter for his enterprise he began to build the road. His opponents complained that he was obstructing the parish road, and attempted to stop the work; but ample and lawful room having been given for the parish road their opposition came to nothing. It is now four years since the work was begun, and Mr. John S. Williams, of Shrieveport, who has been connected with the enterprise from the beginning, informs us that the road is a complete success. At the time of his writing, in March, while the uncovered roads were axle deep in many places with stiff mud, the shed road was firm and dry.

In building the road, the bed, 18 feet wide, was thrown up just enough to keep out the surface water; and over it was put a roof of plank five-eighths inch thick, the planks being 12 inches wide and 20 feet long. Cypress from the neighboring swamp is used for posts, and roughly sawed timber for frame work. By means of an ingenious platform mounted on a common two-horse wagon and supporting a light framework, four men easily put up 20 sections, of 20 feet each, a day. The cost of the road was about $3,500 a mile, with lumber at $1 a hundred feet, labor $1 a day, posts 12½ cents each, earthwork 20 cents a cubic yard, and nails 5 cents a pound. The advantages of the road arise from its cheapness, as compared with any other style of road possible there, its durability, and its unvarying serviceableness. The native clay soil, when kept dry, makes a better roadbed than either wood or stone, and the road is easily kept in repair. The wagons do not touch the woodwork, and the roof will last five times as long as planks laid upon the damp earth. Though the sides are not enclosed the rain does not drive in enough to make the roadbed muddy, much less wash it. In short the practical test of the road, on the score of cheapness and efficiency, has been so satisfactory that the ridicule and opposition it first awakened have been overcome, and other roads on the same plan are about to be constructed.

Germination of Cotton and other Seeds.

In the opinion of General Le Duc a discovery of value has been made in relation to the planting of cotton. A question having arisen as to the situation of the oil cells in Indian corn, the matter was referred to the microscopist, Prof. Thomas Taylor. He found a series of oil cells near the outer surface, and another row immediately surrounding the chit or germinating point, evidencing the complete protection which the latter received. This fact led Prof. Taylor to experiment, with a view to ascertaining the amount of resistance offered to the attacks of agents generally supposed to be of a destructive nature to all organic life, cotton seed being used in the experiments. For the purpose of removing the cotton from the seed he used concentrated sulphuric acid, which completely removes it without visibly affecting the outer brown shell of the seed.

To test the actual effect on the germinating property he handed some cotton seed thus treated and afterward washed, to Mr. Saunders, who planted it. To the surprise of every one except Mr. Taylor, who had foreseen this result if the germ had not been destroyed, the seed came up at least five days earlier than that in its natural state. To ascertain whether this might not be owing to the soaking the seed received, some was kept for several months and then planted at the same time with seed of the same crop unprepared. The same results followed.

The advantage to planters in having five or six days start can scarcely be overestimated, whether availed of in avoiding early frosts or raising early cotton, for which premiums are offered by several cotton boards in the South. But this is not said to be the principal benefit conferred by the discovery. Hitherto cotton planting has had to be done by hand, and the seed sown broadcast, owing to the adherent cotton preventing the seed being used in the planters used for corn and other clean seed. After preparation the seed can be used in any planter, and, by the regularity of growth resulting, the subsequent cultivation greatly facilitated. The mode of preparing the seed is as follows: The seed is placed in an earthen or glass vessel and ordinary sulphuric acid poured over so as to completely cover it. It is then stirred until the brown shell is left free from cotton. The acid is poured off to be used again, and the seed washed till all acidity disappears from the water, and dried. A large quantity is to be thus prepared and distributed among cotton planters for next season. The acid, after it has become saturated or exhausted, is to be experimented with to ascertain whether the glucose cannot be recovered. Experiments are also to be instituted with a view to ascertain the practicability of the process as applied to seeds slow of germination, such as that of the palm, which takes three years to sprout.

Sugar by Diastase.

It is a curious fact that as diastase, or whatever other substance may be the transforming agent in malt, acts upon starch and converts it into maltose and dextrose, so these products in their turn exert a retarding influence upon further change. The presence of a large proportion of dextrose or maltose undoubtedly stops the transformation of starch, and this fact has been recorded by Schutzenberger and others who have studied the question. It is easy to understand, therefore, that in a very thick mash there may be an incomplete conversion; but if a portion of the dextrose or maltose be removed, and a little fresh diastase added, the action will be continued. This is, to some extent, practically done in the sparging operation in the brewery, but in consequence of the high temperatures usually employed most of the diastase is destroyed. It would appear, therefore, that beneficial results would be obtained by reserving a little of the grist for the purpose of sprinkling it over the malt just prior to sparging; this fresh malt would yield the necessary diastase or converting agent required to transform any unconverted starch or dextrine into sugar. It may be argued that there will be loss, in consequence of the last addition of malt not being completely extracted, but this might be obviated by making a small separate mash of it at a comparatively low temperature.—*Brewers' Guardian.*

Land Birds at Sea.

During a recent passage of the White Star steamer Germanic from Liverpool to New York, and when about one thousand miles from Queenstown, a strange bird was discovered in the rigging. The sailors and passengers endeavored to catch it, but without success, until Dr. C. W. Goff, of this city, one of the passengers, came on deck, when the bird at once flew into his hands. The doctor cared for it, and upon the arrival of the steamer presented the bird to the collection at the Central Park. The bird is known as the whimbrel—a peculiar land bird resembling the curlew in habits and about the size of a prairie hen, black and gray plumage, wings like a bat, with a long whalebone-like bill in shape similar to that of a woodcock. Great interest was attached to the bird by the officers of the ship from the fact of its being a land bird found so far at sea, with wings but poorly calculated to sustain it for any length of time.

The owl "Kate Field," captured under similar circumstances in mid-ocean last autumn by one of the crew of the White Star steamer Celtic, is still at the Central Park, thriving, contented, and doing honor by the wisdom of her countenance to the name she bears.

Coin in the Sub-Treasury.

The law requiring the coinage of $2,000,000 a month in silver dollars, in connection with the public aversion to handling large sums in silver when bills can be obtained, has resulted in making a serious plethora of coin in all our government depositories. Those at San Francisco, Cincinnati, and Chicago were all filled early in March, and those at Washington, Boston, Philadelphia, and St. Louis reached the limits of their capacity soon after. As a consequence nearly all the newly-coined silver is being piled up in the Sub-Treasury in this city. This inconvenient treasure, weighing over 612 tons, is stored in a huge vault, 47 feet long, 27 feet wide, and 12 feet high. In the same vault are stored 130½ tons of gold, worth over $65,000,000.

Burnt Alum.

Ordinary alum is a double sulphate of potash and alumina, containing, when crystallized, twenty-four molecules of water. When heated, it melts in its water of crystallization, and on continued heating this is expelled, leaving a dry powder, known in pharmacy as *Alumen usta*, or burnt alum. That sold at the drug stores is often imperfectly dried, and should be placed for an hour or more in a hot bake oven before use. According to C. Bernbeck the best test for a good article is, that it is nearly tasteless when put on the tongue, and takes twelve to twenty-four hours to dissolve in water. Much of the alum now in commerce contains no potash, the alkali being ammonia. Of course ammonia alum cannot be converted into burnt alum, as the ammonia is expelled at the same time, leaving only sulphate of alumina behind.

Memphis Reclaimed.

It is reported that Memphis is at last clean, and so far worthy of exemption from further epidemics of yellow fever. Twenty miles of sewer pipes have been laid already, and over 700 men are now at work for the district government. Thirty miles of sewers will be finished by June 1. This will nearly complete the sewer system. In addition, an equal number of miles of drain tile have been laid. Aside from sewerage and drainage, mention must be made of the cleaning and filling of vaults, the demolition of hundreds of old buildings, the tearing up of the Nicolson pavement, the cleaning up of cellars, and the general renovation of stores and dwellings.