Combating Insects with Disease.

A few weeks ago we published an article in reference to destroying chinch bugs in sorghum fields by introducing insects infected with contagious disease. By the kindness of Mr. M. B Clement, of Sterling, Kan., we have received a small bundle of forage stuff, having many dead bugs attached to the leaves where they died from the effects of contagious disease intentionally introduced.

In this case, as we are informed, myriads of chinch bugs hatched in a wheat field, and as soon as they were able to move about, migrated to the adjoining corn and cane fields, literally covering the plants and destroying them, row by row, as they advanced. A few chinch bugs which had been exposed for twenty-four hours to infection, by being put into a jar containing diseased chinch bugs, were scattered among the destroying insects.

In five days after the introduction of the contagious disease, the destruction of the crop ceased, the myriads of moving insects were motionless, and it was difficult to find any living chinch bugs in the field.

As chinch bugs sometimes injure sorghum, by invasion in countless numbers from the wheat fields where they principally breed, it is a matter of interest to sorghum growers to know whether there are any practicable means of preventing the losses caused by these insects, and for this reason repeated experiments have been made this season in this line at the Sterling Sorghum Experiment Station.

When young the chinch bugs migrate on foot in countless numbers. When winged they fly. Having double means of locomotion, there appears to be no way to bar their entrance into a field of cane. It appears to be impossible to poison these insects in a wholesale way. They live through the coldest winters, they thrive most in the hottest and driest summers. They find a home in the foot stalks, or the funnel-shaped parts of the sorghum leaves which encircle the canes and suck the sweet sap of the cane. A very moderate estimate of the loss caused by chinch bugs in Kansas for a single year is $11 for each man, woman, and child in the State.

The legislature of Kansas appropriated several thousand dollars to be expended, under directions of Prof. Snow, in cultivating and spreading contagious chinch bug diseases. Infected bugs have been sent by thousands all over the State of Kansas, and the evidence which is now accumulating seems to point very strongly to the welcome fact that the losses caused by chinch bugs may be greatly reduced by cultivating contagious chinch bug diseases, and by causing infected insects to spread the disease.

Prof. Galloway, of Washington, is now propagating myriads of germs of a disease which is deadly to the caterpillars. It is said that when a diseased caterpillar is stabbed with a needle, and the needle is put into gelatine or extract of beef, the germs of the disease are transferred to the liquid, and soon every drop contains thousands of the germs of the disease. It is believed that, having the germs of disease, a farmer can prepare quantities of such solution and can distribute it in his fields with an atomizer. Any worm touched must die, and must give the contagion to other worms.

It may be that the cotton boll worm may thus be checked. By cultivating disease we may, perhaps, be relieved of the plague of flies and other noxious insects.

The ethics of the twentieth century may consist in avoiding diseases which now afflict humanity and in giving deadly disease to all living creatures whose interests conflict with ours.—*La Planter.*

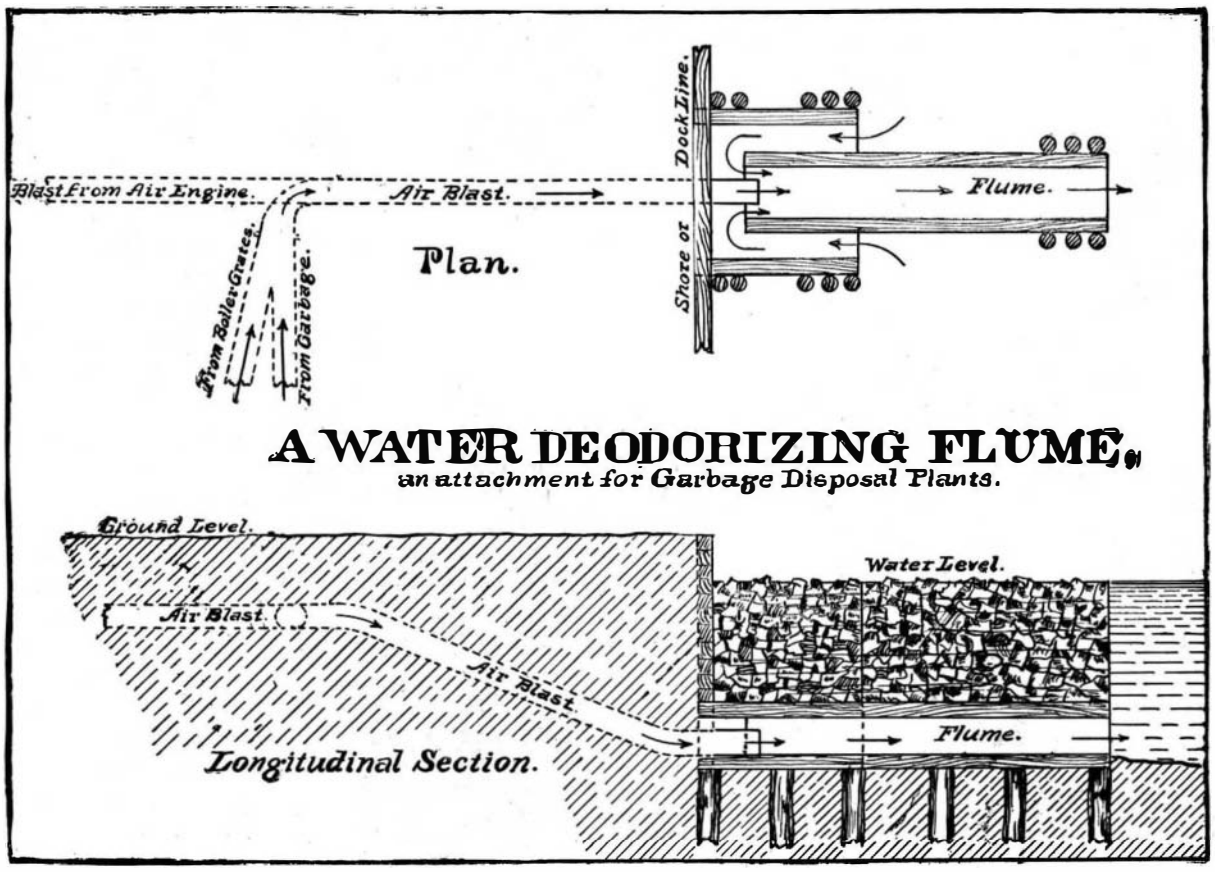
Scallops.

They like the long sedges, or eel grass, and at low tide can easily be taken with a crab net or with the hands. They often have their shells open, and when they see you they seem to give a spring, that is, they shut their shells quickly, which gives them an impetus that makes them rise a little, and they fall about twelve inches farther away than they were at first. The line of motion is a curve, and they generally turn over just as they commence to fall. When caught they seem quite indignant, spit out a stream of water, and open and shut their shells quite rapidly. The part which is eaten is the hard muscle which controls the shells; all around this muscle is soft flesh, like the edges of an oyster, and this extends to the edges of the shells. All around are rows or spots of the most beautiful steel blue. These are probably organs of sight.—*J. Husson.*

A WATER DEODORIZING FLUME.

The illustration represents an attachment for garbage disposal plants, to render inodorous the gases and smells which arise during the process of reduction of the garbage, whether the garbage be burned or dried. All the garbage drying or burning ovens are connected with a pipe leading to the air blast pipe, also the flues from the boiler grates are connected in the same manner, causing a suction of all the smoke and gases from the boiler grates and the garbage ovens, which are delivered into the air blast pipe and are thence driven into the flume, located in twelve or eighteen feet depth of water.

The pressure of air from the air engine causes an outward current from the flume, and the wings upon either side of the flume supply fresh water to assist the operation. The flume may be extended into the water any length desired, and can be used in any stream or body of water where the necessary depth can be obtained naturally or artificially, or by the erection of a tank or reservoir. In the latter instance the flume and wings would be set vertically, not horizontally as shown in the illustration. The process of deodorization is achieved by the mixing of the gases of the ovens and the boiler grates with the oxygen of the water, all moving in ebullition under direct air pressure, through the flume, at a velocity of about five or more feet per second. The plan and operation have been patented by W. F. Goodhue, civil engineer, Milwaukee, Wis.



Marine Phosphorescence, etc.

During the first week of June was seen, off the south coast of Devon, one of the most beautiful natural phenomena it has ever been my privilege to witness. Across Torbay, beyond Hope's Nose to Babbicombe Bay, on to Oddicombe and Petit Tor, far as the eye could reach, the sea was dyed with brilliant crimson, which in the bright summer sunshine looked as if the water was turned into arterial blood, reflecting the light with a weird and wonderful effect. But it was at night the strange phenomenon revealed its full splendor. Then, right and left, far and near, the sea looked like molten silver, tinged with amber, and rich with gold. The far-off horizon was one long bar of glorious light, and as the waves broke upon the rocks, and the surge dashed upon the white pebbles of beautiful Babbicombe Bay, showers of phosphorescent spray were hurled high into the air, producing a spectacle grand in the extreme. The phosphorus which produced this magnificent sight was caused by the surface of the sea being covered with the spawn of the common mussel. When the tide was out, rocks, pebbles, and sand were coated with a thin film of transparent gelatine, which speedily vanished with the light and heat of the noontide sun. What renders the phenomenon peculiar is that I could find no trace of mussel beds in the neighborhood. The phosphorescent effects were greatest on the third night after the spawn was seen upon the water. In another forty-eight hours it had completely disappeared.—*Th. S. King, Science-Gossip.*

Asphalt and Coal Dust Fuel.

The Southern Pacific Company has long had a serious problem to consider in obtaining a proper and cheap fuel for its locomotives. No large bed of coal has ever been discovered in California that could furnish a supply of proper fuel sufficient for this company. The coal now used comes most from Victoria, and is brought to West Oakland in steamers built especially for that trade, and from West Oakland the coal is sent over the road.

The company has now turned its attention to the manufacture of artificial fuel.

A plant has been purchased in England, for the manufacture of an artificial fuel brick from coal dust and asphaltum; capacity five tons per hour. If this process is as successful on this coast as it has been on the Continent, it will be an enormous saving for the Southern Pacific Company.

The machinery will be set up alongside of the coal bunkers on Long Wharf and the coal bunkers will be utilized.

The outfit will cost $75,000, and will have a capacity of five tons of coal bricks an hour.—*Enquirer.*

Luminous Paints.

For orange luminous paint, 46 parts varnish are mixed with 17·5 parts prepared barium sulphate, 1 part prepared India yellow, 1·5 parts prepared madder lake, and 38 parts luminous calcium sulphide.

For yellow luminous paint, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts barium chromate, and 34 parts luminous calcium sulphide.

For green luminous paint, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts chromium oxide green, and 34 parts luminous calcium sulphide.

A blue luminous paint is prepared from 42 parts varnish, 10·2 parts prepared barium sulphate, 6·4 parts ultramarine blue, 5·4 parts cobalt blue, and 46 parts luminous calcium sulphide.

A violet luminous paint is made from 42 parts varnish, 10·2 parts prepared barium sulphate, 2·8 parts ultramarine violet, 9 parts cobaltous arsenate, and 36 parts luminous calcium sulphide.

For gray luminous paint, 45 parts of the varnish are mixed with 6 parts prepared barium sulphate, 6 parts prepared calcium carbonate, 0·5 part ultramarine blue, 6·5 parts gray zinc sulphide.

A yellowish-brown luminous paint is obtained from 48 parts varnish, 10 parts precipitated barium sulphate, 8 parts auripigment, and 34 parts luminous calcium sulphide.

Luminous colors for artists' use are prepared by using pure East India poppy oil, in the same quantity, instead of the varnish, and taking particular pains to grind the materials as fine as possible.

For luminous oil-color paints, equal quantities of pure linseed are used in place of the varnish. The linseed oil must be cold-pressed and thickened by heat.

All the above luminous paints can be used in the manufacture of colored papers, etc., if the varnish is altogether omitted, and the dry mixtures are ground to a paste with water.

The luminous paints can also be used as *wax colors for painting on glass* and similar objects. by adding, instead of the varnish, 10 per cent more of Japanese wax and one-fourth the quantity of the latter of olive oil. The wax colors prepared in this way may also be used for painting upon porcelain, and are then carefully burned without access of air. Paintings of this kind can also be treated with water glass.—*Zischr. Oest. Ap. Ver.*

THE list of articles to be admitted free of duty to Cuba and Porto Rico from the United States, under the new reciprocity treaty with Spain, on and after September 1, includes the following: Woods of all kinds, in trunks or logs, joists, rafters, planks, beams, boards, round or cylindrical masts, although cut, planed, and tongued and grooved, including flooring; woods for cooperage, including staves, headings, and wooden hoops; wood boxes, mounted or unmounted, except of cedar; woods, ordinary, manufactured into doors, frames, windows, and shutters, without paint or varnish, and wooden houses, unmounted, without paint or varnish.