to that of Aphides. It is dark, not light, in color; disagreeable, not pleasant, to the taste; distasteful to the bees, and not coveted by them; unwholesome for winter food for bees, and positively injurious to honey which is to be placed on the market.

Yet this bark-louse cloud has its silver lining. In early spring, before the flowers bloom, it stimulates the bees to their highest endeavor in breeding, so that well-stocked colonies greet the clover-bloom. The apiarist has only to extract this dark, ill-flavored honey at the dawn of the clover season, to convert a seeming ill into an unmixed blessing; especially as this coccid nectar is equally as good as honey for various manufacturing purposes, as the making of printers' rolls, the flavoring of cigars, and the manufacture of honey-cakes. Knowledge and caution on the part of the bee-keeper will keep this dark honey wholly separate from the other, and thus eliminate all harm, and make the former of no small advantage to him.

A. J. COOK.

ECONOMY OF FUEL.

How much can be accomplished in the way of economizing in fuel is shown by the results obtained lately on a trip of the Burgos, a freight-steamer built to carry cargo cheaply at a slow speed. Her engines are on the triple compound system, where the steam — in this case from a boiler-pressure of a hundred and sixty pounds per square inch — is expanded in three cylinders in succession. The average speed at sea, in all weathers, is very nearly ten miles per hour. In a voyage from Plymouth, Eng-, to Alexandria, on the way to China, with a cargo weighing 5,600,000 pounds, and in a distance of 3,380 miles, the consumption of coal was 126 tons (or 282,240 pounds), being at the rate of 83.5 pounds per mile, or .03 of a pound per ton of cargo per mile: in other words, half an ounce of coal propelled one ton of cargo one mile. The *Railroad gazette* very neatly says, "Assuming that paper is as efficient a fuel as coal, we have only to burn a letter on board this steamer to generate and utilize enough energy to transport one ton of freight one mile. It is difficult to realize that so trifling an act as burning a letter involves such a waste of useful energy, or can have any reference to the energy sufficient to perform a feat which, under less favorable circumstances, requires a couple of horses and a teamster for about half an hour."

We may contrast with her performance that of the steamship Oregon, of the Guion line, where every thing is sacrificed to speed. The Oregon has engines of 13,000-horse power, 12 boilers, 72 furnaces, a cargo capacity some seven or eight times that of the Burgos, but intended for passenger business largely, attains an average speed of 17.9 knots (or 20.5 miles) per hour, and burns 337 tons of coal per hour, combustion taking place at the rate of over 16 tons of coal for each mile traversed. The cost of her coal for the voyage is put at considerably over $18,000.

The best locomotive performance in this country of which there is authentic record gives a consumption of about two ounces of coal per ton of freight hauled one mile, at the rate of thirteen miles per hour including stoppages, and rising to five or more ounces per ton per mile on grades of from fifty to seventy feet.

EXPLOSIVES AND ARMOR-PLATE.

DURING the last session of congress the theory was advanced that the effect of a moderate weight of dynamite, exploded in contact with the plates of a modern armor-clad ship, would be disastrous to the vessel. The Naval bureau of ordnance has tested this by exploding charges of gun-cotton and dynamite varying in weight from five to one hundred pounds, against a vertical target composed of nine layers of one-inch wrought-iron plates, strongly backed with twenty inches of wood, and braced so as to represent, as well as possible, the stiffness of the sides of a ship. Though much more work was done than it is likely would ever be performed against the armored side of a ship, the target was not materially injured.

In the course of these experiments it was apparently shown that the point at which a charge of a high explosive is ignited has an important effect upon the work done, since the effects of these charges were readily increased or diminished very materially, according as they were ignited on the side away from or adjacent to the plate; and this, too, notwithstanding the distance between the points of ignition in the two cases was only a foot. It is claimed that this result shows that the charge of a high explosive cannot furnish any tamping effect, but that to produce the greatest effect the ignition must be at some interior point of the explosive, well toward the rear. It also appears that the effects do not increase proportionally to the increase of the charge when the ignition surface remains constant.

The gradual ignition of the charge, even in the case of so violent an explosive as gun-cotton, was strikingly illustrated by the fact that when twenty-six pounds of wet compressed disks of that material were piled upon an iron plate, and exploded from the top (without tamping or cover), accurate impressions of the lower disks in the pile were stamped upon the iron underneath them. In this case there did not seem to be the least doubt concerning the complete explosion of the charge.

Experiments were also successfully made in firing shells charged with gun-cotton from ordinary rifled cannon, twelve rounds being fired from the twelve-pound howitzer, and thirteen rounds from the eighty-pound breech-loading rifle, and the ordinary service charges of gunpowder being used in the gun. Three unfuzed shells, charged with gun-cotton, were fired from the eighty-pounder against the target used in the dynamite experiments. The shells exploded with great violence, on impact; but the damage to the target was very slight, as the explosion took place before any practical penetration was effected. In view of recent successful experiments with a fuze