PARASITES ON A CATERPILLAR.

The accompanying illustration represents one of the green sphinx caterpillars so frequently found feeding upon the leaves of wild cherry trees, grapevines, etc. The specimen in question, however, is greatly burdened with a large number of egg-shaped cocoons of a parasitic insect, an ichneumon fly, the cocoons sticking out of the caterpillar's skin the same as bristles on a round brush.

This parasitic insect, on maturing in its shell, bursts the upper end thereof, crawls out, and then sails forth on its own wings. The minute ichneumon flies lay their tiny eggs in the skin of the caterpillar, and from these eggs hatch the larvæ, which live within and get their nourishment from the caterpillar.

The caterpillars infested by these parasites die before attaining maturity; but if healthy caterpillars that are not burdened with the parasitic cocoons be found, it is possible to obtain a pupa or chrysalis which, when properly kept, will change the following year to a moth belonging to the sphinx or hawk moths, which in the morning and evening twilight dart swiftly from flower to flower in search of honey as their food.

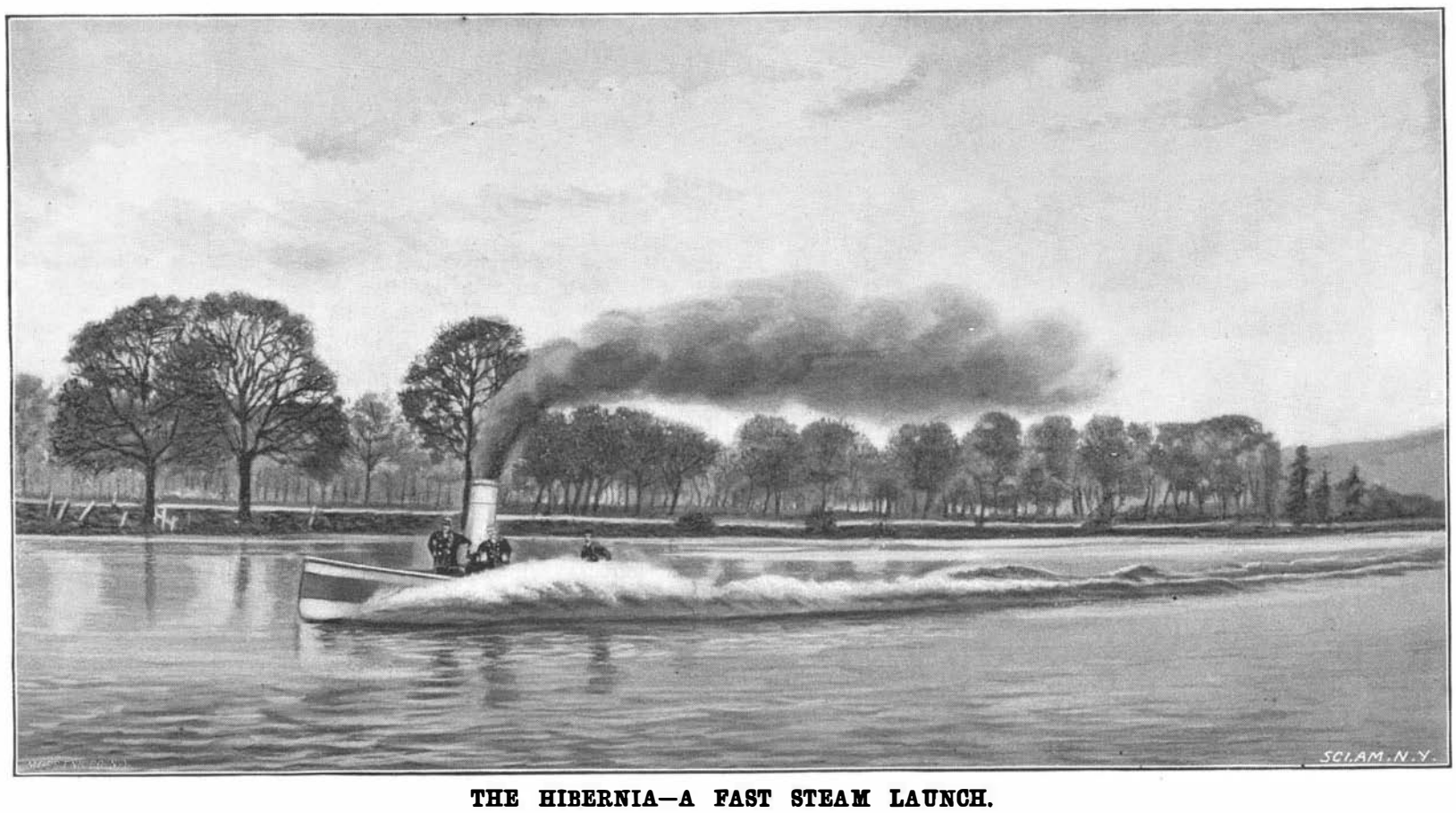
PARASITES ON A CATERPILLAR.

On Manganese Steel.

Manganese steel (13 per cent of manganese) is not magnetic, and of all the alloys of iron it is the one which presents the highest electric resistance. It is the more malleable the more energetically it has been tempered. There is a second allotropic variety which is magnetic. M. Le Chatelier has determined the conditions of the transformation of the two varieties of manganese steel into each other. To convert the non-magnetic into the magnetic metal it is heated to 550 degrees from one to two hours. To convert the magnetic metal into the non-magnetic metal it is heated to 800 degrees and cooled rapidly, so that the inverse change may not be produced between 500 degrees and 600 degrees. The expansion of the two varietes of manganese steel has been found alike which excludes the existence of a change of dimension at the point of transformation. Manganese steel tempered in water on reheating undergoes a contraction of 0·4 mm. in 100 mm.—H. Le Chatelier.

THE HIBERNIA—A FAST STEAM LAUNCH.

Our engraving, for which we are indebted to the Engineer, London, represents the Hibernia, a boat built and engined from the designs of Mr. G. F. G. De Vignes, by Messrs. Simpson & Strickland, at Teddington. It is, we believe, the fastest boat of its size afloat, and a trip in it is an experience. At ordinary speeds the Hibernia behaves like an ordinary boat, cutting her way through the water and leaving a moderate impression in the form of shore waves. With a slight touch of the regulator she leaps forward, and as the speed increases, she gradually sinks a little by the stern, rises a little at the head, until at a certain high speed the bow rises clean out of the water, and the boat flies along at the top of it, throwing a double wall of spray, between which she flies at a speed of about 29 miles an hour with the stream and 26¼ miles against the stream, as measured and remeasured at Mousley. There is but little chance of making these speed trials, and very great risk in making them in this part of the river, for among other difficulties which arise are the objections which owners of house boats urge against having their boats lifted up on the banks and left there. Some idea of the power of this boat, which is the property of Mr. R. H. Lebat, of Hampton Wick, may be gathered from the following statement of dimensions and engine power: The length of the boat is 48 feet 3 inches over all; breadth, 7 feet 3½ inches; draught, 1 foot 4½ inches; and depth of propeller below the water line, 2 feet 5 inches. The boiler is of steel, locomotive pattern, with barrel five-sixteenths inch thick, quintuple riveted in longitudinal seams. The engines are two-cylinder, both high pressure, 7⅛ inch diameter, stroke 6 inches, revolutions about 750 per minute up to 1,050 revolutions per minute when doing the highest speed. The propeller has three blades of hammered double shear steel, with carefully prepared surface and knife edge, keyed in a wrought steel boss and accurately balanced. The engines are of small dimensions, except in the wearing and hard working parts, and here the dimensions are very large, and at first glance disproportionately strong. Every detail has been most carefully designed, and carried out with equally careful workmanship and excellent finish. The boat was built for Mr. Lebat chiefly for umpire work at regattas and coaching university crews, and it began coaching for the last races within an hour of steam being first raised. From that time to about three weeks ago the boat ran over 3,300 miles without the touch of a spanner. We have never seen a finer piece of work than these little engines, and Mr. Lebat is to be congratulated on the high quality and performance of both engines and boat.



THE HIBERNIA—A FAST STEAM LAUNCH.

Slate—How it is Mined.

The manner in which slate is mined and cut up for purposes to which it is applied is a process that is known to only a few people in this country, its principal sources being in upper New England and eastern Pennsylvania. It is not taken out of shafts, but it is quarried out of big holes in the earth. Some time ago, when the writer was at Bangor, Pa., he was invited to go down into one of these quarries, about 200 feet deep, and overhand on a rope, but he declined the invitation, as I think most inexperienced persons would do. The slate is blasted out in huge blocks and is hoisted out by steam and turned over to the men who know how to reduce it to the proper size. Huge blocks of it are taken in hand by these workmen, who cut a notch into one end of each piece. Then they take a chisel and a mallet, and they are so skillful in directing their blows that they can split the blocks of slate in almost any way they please. If you watch the slab on which one of them is working, you will see a little hair line running through it, and presently the block will fall apart on either side of this mark. The workman will make this line go straight through the middle, or to either corner, just as he likes. I do not know just how he does it, but he invariably accomplishes what he sets out to do. The smaller pieces thus produced are taken in hand by another set of men, who split them up into sheets of the proper thickness for roofing slate. This they do with a long-bladed instrument about the shape of a putty knife, but many times larger, and if you saw them do it, you would marvel how they got the sheets only inch thick and split it thirty-two times. The usual number of divisions is sixteen. These sheets are taken and cut into squares by machinery.

Wherever there are slate quarries you will find a great many Welshmen, for the best slaters come from Wales. Boys follow the trade of their fathers, and there are whole familes and settlements who know no other means of earning a living.—New York Advertiser.

Aluminum Shoe Nails.

On the late visit of Prince Bismarck to the Emperor, the latter called the attention of the ex-Chancellor to the improvements made in the boots of the Prussian infantry. This consisted in the displacement of the old fashioned steel nails by nails from aluminum, which is much lighter and more durable. The extra weight under the sole of the foot imposed by the heavy nails formerly worn, and the added weight consequent upon the clogging mud in nasty weather, made a great and needless extra amount of muscular expenditure necessary. The new arrangement will permit of longer and better marching, with fresher troops at the end of the day.