"tenpenny" was a corruption of "ten pun-ny," from "ten pun," meaning ten pounds to the thousand.

Mr. Hudson would only undertake to say that "tenpenny," as applied to nails, was an old English term applied two or three hundred years before the cut nails of the present day were made.

The rational explanation was given by a gentleman, who said that originally, when nails were made by hand, the workmen were paid so many pence per hundred, and in that way the nails got their names, as "fourpenny," "fivepenny," "tenpenny," etc. This explanation, as being manifestly the true one, was greeted with applause.

Mr. McDonough, from California, exhibited a model of a new steam plow of his invention, which greatly interested the savants.

THE NATIVE SILKS OF ASSAM.

By C. G. WARNFORD LOCK.

THE native silks of Assam, known as *Eria* and *Muga*, are the produce respectively of *Attacus ricini*, and *Antheraea assama*, and *Antheraea mezankooria*.

The *Eria* worm is so called from the local name of the castor-oil plant (*Ricinus communis*), on which it is almost exclusively fed. It is reared entirely indoors. The duration of its life varies with the season: in the summer, it is shorter, and the product is both better and more abundant. At this season, 20 to 24 days elapse from the date of its birth to the time when it begins its cocoon, 15 days later the moth is produced, in three days the eggs are laid, and in five more they are hatched, making the total duration of a breed 43 days. In winter, its life extends to nearly two

left hand, while the right is employed in drawing out the silk. Any inequalities that may exist are reduced by rubbing them down between the thumb and finger; the same process serves for joining on new cocoons. The thread is allowed to accumulate in quantities of about half a pound; these are afterwards exposed to the sun, or placed near a fire, till dry, when they are wound up into skeins. The silk is then ready for the weaver. It is the coarser of the two kinds, and none of it ever finds its way into Bengal.

The *Muga* moth is found wild in the jungle, but all the silk produced by it is from domesticated worms. They are reared on trees in the open air. There are generally five breeds in a year, viz., January to February, May to June, July to August, September to October, and November. The first and last yield the best crops, as regards both quantity and quality. Constant watching of the tree is necessary. By day crows and other birds pounce upon the worms, and devour them. By night bats, owls, and rats are very destructive. Numbers of the caterpillars are destroyed in the more advanced stages by the stings of wasps, and by the ichneumon insect, which deposits its eggs in the bodies of the worms. The latter thrive best in dry weather, but a very hot sunny day at the moulting time proves fatal to many. Indeed, at this period, rain is considered very favorable; and even thunder storms are not injurious, as they are to the mulberry worm. Continual heavy rains do mischief by sweeping the worms off the trees; but showers, however violent, cause no great damage, the worms generally taking shelter under the leaves with perfect safety. During moulting the worms remain on the branches, but when about beginning to spin they come down the trunk. Bunches of fresh plantain leaves are tied round the trunks,

good annual return if an acre of trees support 50,000 cocoons, yielding upward of 24 lb. of silk. It must be very profitable, as 1,000 cocoons are reckoned to afford 6 to 8½ oz. of silk thread, selling at 10s. to 13s. a pound. The labor and expense of maintaining a plantation of the trees is very trifling.

Two kinds of silk are distinguished by the natives as the production of the *Muga* worm—*muga* and *mujankuri*, their difference being attributed to the trees on which the worms are fed; but naturalists have determined a specific difference in the worms themselves, calling the former *Antheraea assama*, and the latter *Antheraea mezankooria*. The *Muga* worms feed chiefly on the *sum* tree (*Artocarpus chaplasha*; *Tetranthera lanceolata*); *mujankuri*, from those fed on the *adakur* tree (*Tetranthera quadrifolia*). The latter is whiter and better than the former. Some of the silk thread produced in Sibhsagar sells for as much as 36s. a pound. Lakhimpur, in 1871, exported 11¼ tons of *Muga* silk thread, valued at £6,000.—*Jour. Soc. Arts.*

BREWING IN AUSTRIA.

As a specimen of an Austrian brewery, and of the apparatus used therein, the Figs. below illustrate in plan and section the arrangements adopted in a modern establishment. The malt crusher is placed in the loft above the boiling house and fed by an elevator. The malt wagons are fitted with a hopper, and are manipulated on rails, which run from beneath the crusher over the weighing machine, B, to the feed pipe, C, which communicates with the auxiliary mashing apparatus, D, and through it with the mash tun, E. The mash and clearing tun, E, is placed at such a height that the

AUSTRIAN BREWERY PLANT.

months. Seven breeds are reckoned upon annually. For breeding the natives select cocoons from among those which begin to be formed in the largest number on the same day. Those containing males are recognized by a more pointed end. On the second or third day after the cocoons have begun to be formed they are put into a closed basket and hung up in the house, out of reach of vermin and insects. Twenty-four hours after the moths have been produced the females are tied to long reeds or canes, 20 to 25 to each, and these are suspended in the house. The eggs laid during the first three days alone are kept; they are tied up in a piece of cloth, and hung from the roof till a few begin to hatch; these eggs are white, and resemble turnip seed in size. When a few of the worms are hatched the cloths are put on small bamboo platters, and here they are fed with tender leaves. After the second moulting, the worms are removed to feed on bunches of leaves, suspended a little above the ground, and a mat is spread beneath to catch those which fall. When they have ceased feeding they are placed in baskets filled with dry leaves, among which they form their cocoons. In four days the latter are complete. A selection having been made for the next breed, the remainder are exposed to the sun for two to three days, to destroy the vitality of the chrysalis. The cocoons are next generally put into water containing potash (wood ashes), over a slow fire; when removed the water is gently squeezed out. At other times they are massed together for some days with *amrita* (*Carica papaya*?) or *madhu* fruit. The object is the same in either case, viz., to facilitate the drawing of the silk. The cocoons thus treated are taken one by one, and the silk is placed within the thumb of the

at some height from the ground, in order to arrest their progress. The worms are then collected in baskets, which are put under bunches of dry leaves, suspended from the roof of the house; they crawl up into these and there form their cocoons. The total duration of a breed varies from 60 to 70 days; the period is thus divided: 4 moultings, 20 days; from fourth moulting to beginning of cocoon, 10 days; in the cocoon, 20 days; as a moth, 6 days; hatching of the eggs, 10 days; total, 66 days. The chrysalis, not being easily killed by exposure to the sun, a number of cocoons are placed upon bamboo stages, and covered with leaves, while a quantity of dry grass is ignited below them, and in a short time destroys them. The cocoons are then boiled for about an hour in water containing potash (the ashes of mustard and other plants). When taken out they are laid between folds of cloth. The floss is removed by hand, and the cocoons are thrown into hot water. The instrument used for winding off the silk is the roughest imaginable. A thick bamboo, about 3 feet long, is split in two, and the pieces are driven equally into the ground about 2 feet apart; over the interior projection of one of the knots is laid a stick, to which is fixed, a little on one side, a round piece of plank, about 1 foot in diameter. The rotary motion is given by jerking this axle, on which the thread rolls itself. In front of the vessel holding the cocoons a stick is placed horizontally for the thread to travel upon. Two persons are employed—one attends to the cocoons; the other jerks the axle with the right hand, and with the same hand directs the thread up the left forearm, so that it is twisted in coming down again toward the hand, while the left hand conducts the thread over the axle. The Assamese consider it a

mash and wort can run down into the mash and wort pan, G, by gravity. The stirrer is suspended and driven by shafting, the flues surround the pan to the height of the lowest level of water in practice, and the draught is regulated by a damper. A steam dome, M, with pipe and movable cover for giving admission, completes the pan. The return of the boiling mash to the mash tun, as well as of the boiled mash to the clearing tun, is effected by a centrifugal pump, K, with the necessary pipes, valves, and taps. The pipe by which the mash is brought from the pan to the tun can be turned round to convey the contents, when sufficiently boiled, to the clearing vat. The wort is run from the clearing vat to the reservoir or back, and from there into the inclosed square wort pan. The wort when strained is raised by a centrifugal pump to the cooling back. The average proportion in Bohemia is about 1 bushel of malt to 21.15 gallons of beer. The system of cooling in Austria is much the same as that adopted in England, excepting that the use of ice is, as we have explained in previous articles, more general, and the action more rapid and better for the beer. The wort arrives at the cooler with a temperature of 200 to 208 deg., and is reduced as rapidly as possible to 55 to 65 deg., as the best for commencing fermentation, requiring from six or seven hours to twelve or fifteen—the shorter the better—and as the temperature of the outer air should, if possible, not exceed 50 to 55 deg., spring and autumn are chosen as the seasons best suited for brewing. The amount of ice consumed in the operation can easily be calculated; for 1 lb. of ice requires the heat contained in ¾ lb. of boiling water to melt it; therefore to reduce 5,000 lb. of wort from say 50 deg. to 45 deg., or 5 deg., requires 5×5,000=25,000 deg. of