

SCIENTIFIC AND PRACTICAL INFORMATION.

HOW TO KILL GRASSHOPPERS.

Reports of Western railway trains stopped by grasshoppers are apt to be taken by Eastern people as samples of Western humor rather than as statements of actual fact. Similar incredulity was manifested on the other side of the Atlantic, a few days ago, when a telegram came from Algiers telling of the delay of a train from Oran, six hours, for the same cause, namely, the accumulation of grasshoppers on the rails. But it was no joke. The grasshoppers are as great a pest there as they are in some parts of the Far West, and just now they threaten the utter destruction of the growing crops over considerable areas.

Many plans have been tried for their suppression, the most successful, according to a circular of instruction lately issued by General Chanzy to the generals of division and prefects of Algeria, being that employed in Cyprus. By this plan the attack is made neither on the eggs nor on the fully developed insect, as practised elsewhere, but during the intermediate or wingless period of their development, a stage beginning about a month after the eggs are hatched, and lasting three or four weeks, during which the "crickets" wander about in compact masses and are easily taken in V-shaped traps open to the line of march. The sides of the traps are made with strips of silk a hundred yards long and two or three feet wide firmly attached to poles set in the ground. The bottom edges of these walls of silk are banked with earth so that the crickets cannot crawl under them, and the upper edges are waxed or bordered with oiled silk, which prevents their climbing over. As they have no wings to escape with, they are forced to mass themselves at the apex of the system (as it is called) where they tumble into a trench edged with plates of zinc, which offers no foothold, so that they are effectually trapped. When the trench is full the insects are covered with earth, and the system is moved on to continue the work of destruction elsewhere. Upwards of 7,000 cubic yards of grasshoppers were thus destroyed in Cyprus in a single season. With the conversion of our Western plains into farm lands, it is becoming more and more necessary to combat the grasshopper plague on a grand scale. Our farmers will do well to profit by the experience of the East.

VANILLA FROM PINE TREES.

There has recently been submitted to the French Academy some small crystals which are the pure aromatic principle of vanilla. These, it is remarkable to note, were extracted from conifers. The cambrium of the latter contains a crystallized glucoside, coniferine, which MM. Tiemann and Haarmann consider represented by the formula $C^{16}H^{86}O^{18} + 2H^2O$. Submitted to the action of emulsion, the coniferine separates into glucose and a component crystallizing in fine prisms which melt at $163^{\circ}4'$ Fah. The latter material is readily soluble in ether, less soluble in alcohol, and insoluble, or nearly so, in water. It contains $C^{10}H^{18}O^3$. Under the influence of oxidizing agents, the product of the fermentation undergoes a remarkable change. In warming it with a mixture of potassic bichromate and sulphuric acid, it disengages first ethylic aldehyde, and then an acid substance soluble in water, which may be separated by agitating with ether. By evaporating the latter, star-shaped crystals are obtained which melt at $177^{\circ}8'$ Fah., and which are identical with the aromatic principle of vanilla. The formula is $C^8H^8O^3$, which corresponds exactly with that attributed to the aromatic extract of vanilla.

NOVEL IMPROVEMENTS IN STEAM BOILERS.

Mr. Charles H. Haswell, a well known engineer of this city, has recently patented a new steam boiler which presents many valuable points of advantage, and which appears to be well worthy of the examination of steam users generally.

It is hardly possible to enter into the details of the invention without the aid of illustrations. In the improved boiler, the principal features consist in inclined tubes, which extend transversely across the boiler and slope from the central flue down to the two side flues. By this arrangement, a transverse area required by the area of grate surface, the area of heating surface, and the volume of the steam chamber above can all be obtained without prejudice to the height of the furnace below, and without involving an impracticable length of boiler. The tubes can also be readily removed and replaced, and the necessary work can be prosecuted within the boiler. A vertical diaphragm is introduced in the return flue, which serves to direct the products of combustion so as to admit of the base of the smoke pipe being located at any portion of the length of the boiler, a matter of great convenience in the construction of sailing steamers. The smoke connections are arched, and consequently afford the required length without bracing.

Mr. Haswell has also patented another invention relating to steam boilers having a steam chimney—notably marine boilers—which has for its object to strengthen the boiler and to brace the chimney. It consists in retaining the boiler shell between the outer shell and the inner shell of the steam jacket, and joining it to the latter instead of cutting it out as heretofore. The reclaimed portion is perforated, so as to allow a free circulation of the steam between the boiler proper and the steam chimney. Mr. Haswell is of opinion that the usual removal of this part of the boiler is a cause of weakness, which is obviated by his invention; while, at the same time, he secures increased strength to the chimney and adjacent portions.

Both devices seem to us practical and useful, and there is little doubt that they will meet in practice with that ready appreciation from steam engineers which is so confidently expressed by them on an inspection of the inventor's models.

Natural Gas for Puddling.

A novel feature in iron working has been introduced recently by Messrs. Rogers & Bruchfield, of the Siberian Iron Works, Pittsburgh, which consists in the application of gas from a gas well as fuel. Their mill is situated at Jeeshburg, Armstrong county, and is devoted to the manufacture of sheet iron. The well is situated on the opposite side of the Kiskiminetas River from the works, and is 1,200 feet deep. The gas is let from the well through steam pipes into a horizontal cylinder, with safety valve nearby, and thence across the river to the mill. Here it is fed under the boilers through a horizontal pipe, running longitudinally their entire length, pierced with small holes. A very perfect combustion is secured in this way. It is fed in the puddling and heating furnaces in like manner, through a pipe in the rear of the fire bridge, but here the combustion is not so perfect, and considerable black smoke is seen issuing from the stacks. An ample supply of gas is furnished by the well, and at a very regular pressure, which has not been measured, but is thought to be over 30 lbs. The volume of gas used is easily controlled by cocks, and can be adjusted for various purposes with the utmost nicety. "Mr. Rogers estimates that the saving to them in fuel amounts to \$700 per week and states that they obtain 33 1/2 per cent more yield from the metal than they did when using coal—at the same time producing an article of very superior quality, on account of the purity of the gas. The firm is now manufacturing an article of tin plate, which they claim to be equal, if not superior, to any manufactured abroad, which they could not do when using coal. The well was bored for oil originally, and had been in existence some four years when the idea was conceived to utilize its gas in this way, four months ago.

Our readers may remember that on page 370 of our last volume we gave an account of the gas wells of New York State, as presented by Professor Wurtz, who shows that there are three belts of gas wells running across this State. In view of the successful application of natural gas to puddling in Pennsylvania, he suggests a trial boring here. "Think," he says, "what a noble thing may be before us: should we find ourselves able to tap and draw from stores of gas pent up under the Catskill range, conduct this gas to the brink of tide water along the Hudson, and operate therewith upon the pure limonites of Putnam, Dutchess and Columbia, and the magnetites of Orange and Rockland, Champlain and the Adirondacks. "Making two blades of grass grow where one grew before" would be a feeble figure of speech to apply."

Hygienic Treatment of the Aged.

Mr. Habershon, in a clinical lecture at Guy's Hospital, London, referring to the case of an old man, remarked: "The man died simply from the shock produced by coming out into the cold and fog, which, though only an inconvenience to us, was sufficient to lead to a fatal result on one whose circulation had become enfeebled, and whose vital force had so nearly lost its power. I am reminded, by this case, of an instance of longevity communicated to me by a gentleman the other day. His mother, who had died at the age of one hundred and two, during the winter months had refused to get up, saying that she was only warm in bed. I have no doubt that it was owing to this uniform, warm temperature that she lived so long; and I mention the instance as a recommendation for you, when you have to prescribe for old people, to advise that they be kept warm. You should also look carefully after their nourishment. Old people cannot eat large meals; therefore they must take them more frequently. Many old people will wake up about three or four o'clock in the morning. It is a good plan that they should have some nourishment then; otherwise the interval between the night and morning meals is too long for their declining strength. It is by care in such minutiae that we may prolong the life of the aged."

The Magnetization of Steel.

If a recently tempered steel needle be introduced into a magnetizing bobbin connected with a battery of constant current, battery and bobbin comprising the circuit, it acquires a total determined magnetism at the end of a period which appears not to exceed that of its introduction. On slowly withdrawing the needle, it is found to retain residual magnetism which, together with the total magnetism, increases with each repeated introduction until a limit is reached. The needle may be magnetized in the bobbin by three other methods:

1. *Establishment.*—Introduce the needle; establish the current; slowly withdraw the needle.
2. *Interruption.*—With a closed circuit introduce the needle slowly; break the current and withdraw the needle.
3. *Instantaneous Charge.*—Introduce the needle; establish and break the current; withdraw the needle.

Repetitions of any of these three processes (all things being equal) insure an augmentation of the needle's magnetic moment.

THE LARGEST LOCOMOTIVE IN THE WORLD.—A correspondent states that the largest locomotive in the world is the "Pennsylvania," on the Philadelphia and Reading Railroad. The principal dimensions of this engine are as follows: Diameter of cylinders, 20 inches; length of stroke, 26 inches; number of driving wheels, 12; diameter of drivers, 4 feet; and the weight of the engine alone is 60 tons.

CEMENT FOR CAUSTIC LYE TANKS.—The tanks may be formed of plates of heavy spar, the joints being cemented together by a mixture of 1 part of finely divided caoutchouc, dissolved in 2 parts of turpentine oil, with 4 parts of powdered heavy spar added.

Qualities Most Estimable in the Rose.

A rose, taking all things into consideration, is, perhaps, the most splendid of flowers. Throwing aside the national affection for our emblem, the rose is appreciated for itself. It has qualities peculiar to itself. It is beautiful, from the moment when the color peeps from its green covering, until its flower is complete—handsome in all its stages. Its perfume is unequalled; and whether it be a single bud or bloom in the hand, a bush in the border, a tree on the lawn, or climbing the pillar, or winding around the archway, or covering the front of a house, it is equally admired.

In estimating the various qualities which give value to the rose, we are almost inclined to place that of continual blooming first, even before perfume, although without this a rose loses its great charm; but continuous flowering is of so much importance, the prolonging of the beauties of the garden is so essential, that we think it of more consequence than any other feature. See a garden, liberally planted with summer roses, in a blaze of beauty in June or July, and it is a second paradise; but what is it before or after that period? The rose trees bereft of adornment are eyesores; they are, in fact, in the way until they bloom again. But see the same or another garden, judiciously supplied with continuous blooming roses of the nature of the common China, and we have them in flower the last of all our favorites. A frost that will kill down dahlias to the ground will only injure the flowers of the rose; the buds are scarcely damaged, and it is not an uncommon thing to see continuous blooming roses flowering in a mild autumn up to Christmas; and be it remembered that we have now hundreds of beautiful varieties possessing this valuable quality.

We now come to a quality which is of more importance than it at first seems—namely, thickness of petal. The advantages of this are, first, that, whatever be the color, it is more dense than it can be in a thin petal; but apart from the superiority of color, thick petals are more lasting than thin ones, and sun and winds have less effect upon them. A rose with thick petals will remain perfect for days, while thin ones are burnt or shrivelled in a few hours; and we hardly know of a more disagreeable fault than speedy decay. To see the ground strewn with petals in a few hours, and the plants disfigured by the remains of decayed flowers, is very far from pleasant, and this is inevitably the case with thinly petaled roses.

Upon the whole, the qualities of a good rose are—continuous blooming; thick, smooth-edged petals; flowers round, forming half or two thirds of a ball, very double and full-faced, very symmetrical and imbricated; wood short-jointed; color dense, that is, whatever its shade be, the color decided; and, if striped or blotched, the stripes or blotches well defined.—*The Farmer.*

Training of Boat Rowers.

At some of the colleges the training of the racing crews is about as follows:

In the morning an easy walk of an hour's length, at noon a quicker walk of half a hour, and in the afternoon a pull of seven or eight miles, after which comes a bath and a good rubbing down. The system of diet is rather one of proscription than prescription. Certain articles well known to be unwholesome are proscribed. Other things may be eaten. Pastry, tobacco, coffee, pork, and all stimulants are ruled out. The crew pulled a plain forward and back stroke, with no special pretension to style or scientific points, making generally 32 strokes to the minute.

Car Couplers, Draw Bars, and Buffers.

It appears from the discussions of the Car Builders' Association that the members are not quite decided as to which of the various devices for couplers, draw bars, and buffers they ought to recommend for general adoption. The subject is regarded as one of great importance, and is continued for another year.

RECENTLY PLANTED TREES AND SHRUBS IN HOT WEATHER.—This is a trying time for young trees. Those that were set this spring, and have appeared to be doing well thus far, may succumb to the long continued drought and heat of midsummer. It is safest to mulch all young trees; but where this has not been done, all those that show signs of suffering should be attended to at once. A timely mulching may save the tree. It makes but little difference what material is used so that the soil around the tree is prevented from losing its moisture by evaporation. Stones, if most convenient, will answer as well as anything. If the trunk is fully exposed to the sun, it should be protected from intense heat. A couple of boards, tacked together like a trough and set up against the trunk, will furnish the required shade; or the trunk may be bound with a hay rope, or be loosely strawed up as for winter protection.

A CORRESPONDENT, J. H. says: "I consider the SCIENTIFIC AMERICAN to be an actual necessity in my shop, and I do not intend ever to be without it. I have gained more information from it than from all other papers and books combined. I have been a constant reader of it for nearly thirty years, and you may put me down for a life subscription."

CHARLES MERRILL & SONS have just completed, for the Lallance and Grosjean Manufacturing Company, of this city, the well known manufacturers of stamped tin ware (known as French tin ware), the largest drop press, we believe, yet made, it having a hammer and die 36 inches in diameter, weighing 2,000 pounds, and falling 3 feet 6 inches. The base of the drop weighs 6 tons, and its elevation is about 12 feet.