

this country, a number are reshipped to South America, where they are used on social occasions as well as at public fetes. They are used in the south at Christmas time, and also in Canada on May 24, which is Queen Victoria's birthday. Cannon crackers are made in this country, but the small ones cannot be produced here at anything like the price they can be furnished by the Chinese. Their product is carried half way round the world, pays duty, and is then sold for 85 cents a box. In the McKinley tariff bill now before Congress, the duty on fire crackers is placed at 8 cents a pound, which will make the tax 63 cents as against 28 cents a box, which is the rate paid now. If this provision of the new tariff bill is adopted, it will probably have the effect of stimulating the manufacture of cannon crackers in this country.

Fire crackers are of very ancient origin. Dr. Williams in his exhaustive work on China, entitled "The Middle Kingdom," says: "No evidence exists of the use of gunpowder as an agent of warfare until the middle of the twelfth century, nor did a knowledge of its propulsive effects come to the Chinese until the reign of Yunglop in the fifteenth century—a thousand years after its first employment in fire crackers."

SPEED TRIAL OF THE CRUISER PHILADELPHIA.

The new cruiser Philadelphia, built for the government by Messrs. Cramp & Sons, at Philadelphia, has been so far completed as to be able to make her four hours' trial under steam, as required by the contract. By the terms of the latter the vessel was to be capable of making a mean speed of 19 knots per hour during a four hours' run at sea. If she made less, then the contractors were to forfeit \$50,000 for each quarter knot below the standard. If she exceeded 19 knots, the contractors were to receive a premium of \$50,000 for each quarter knot in excess of the standard.

The trial took place on the 25th of June, off the southeasterly end of Long Island, a measured course of forty miles having been marked out for the purpose. The conditions of sea, wind, and tide were as favorable as could be asked. According to all the accounts so far given, the trial was a complete success. It is believed the ship made an average of 19½ knots per hour, and earned a premium of \$100,000 for her builders.

The Philadelphia is an unarmored cruiser of 4,324 tons. There are seven other ships of about the same size, but they are not all yet completed. It is not claimed that any of these vessels is able to fight a modern armored ship. The object in building these cruisers is to provide a fleet of fast vessels having speed enough to keep out of the way of ironclads and overhaul merchant vessels.

The contract price of the Philadelphia was \$1,350,000. She was built from English designs, obtained by the Navy department several years ago, and though she is a good vessel, can hardly be said to represent the latest and best type of cruisers. Her construction was authorized and bids opened in 1887. It has taken not quite three years to build and put her on trial.

A full page engraving showing a portrait of the Philadelphia, and various details representing the mode of her construction, was given in the SCIENTIFIC AMERICAN of August 10, 1889.

How Diphtheria is Spread by Corpses.

Dr. Baker, the secretary of the Michigan State Board of Health, has issued a circular stating that in March two corpses, those of a woman and child of the same family, dead of throat disease, certified by the attending physician not to be "dangerous to the public health," were conveyed from Montmorency County to Lapeer County, Michigan, where in just a week from the day the coffins were opened and the remains viewed a person who was thus exposed came down with diphtheria. Many others, says Dr. Baker, would probably have been exposed except for the action of the local health officer, Dr. C. A. Wisner, who, suspecting that the cause of the deaths was diphtheria, warned the neighbors and forbade the opening of the coffins at the funeral. He promptly isolated the first person that was attacked, and no epidemic resulted. This, Dr. Baker adds, is quite different from the result of a similar occurrence at Zanesville, Ohio, last spring, where many deaths resulted from exposure to a corpse brought from Chicago. It shows the importance of notice to the local health officer of the arrival of a corpse, so that he may take every precaution that may be necessary.—*N. Y. Medical Journal.*

BIBLICAL units have the following equivalents: A shekel of gold was \$8. A firkin was seven pints. A talent of gold was \$13,809. A talent of silver was \$538.30. Ezekiel's reed was nearly 11 feet. A cubit was nearly 22 inches. A bin was 1 gallon and 2 pints. A mite was less than a quarter of a glass. A shekel of silver was about 50 cents. A piece of silver, or a penny, was 13 cents. A Sabbath day's journey was about an English mile. An ephah, or bath, contains 7 gallons and 5 pints. A day's journey was about 23 1-5 miles. A hand's breadth is equal to 3½ inches. A finger's breadth is equal to 1 inch. A farthing was 7 cents.

Ants.

To the Editor of the Scientific American:

An India rubber tree was placed on the lawn of a house which has been inhabited several years. Till the tree was planted there no ants had been seen either inside or outside the house. Soon after locating the plant referred to, millions of ants appeared, and they have increased so rapidly that they have now become a formidable nuisance. No expense or trouble has been spared to get rid of these pests, the nuisance increasing rather than diminishing. The lawn has been resodded, but still swarms of ants infest the premises.

Can any of your numerous readers give me a remedy against this plague, and some information respecting the apparent partiality of these prolific insects for the India rubber plant? None of the adjacent lawns has been invaded, the ants confining themselves to the places on and near where the plant was placed.

C. T.

ANSWER BY PROF. C. V. RILEY.

It is difficult to answer intelligently Mr. Trench's communication in the absence of further particulars, and more especially as no specimens of the ant were forwarded for identification. If the ant is the common house ant (*Monomorium pharaonis*), it is safe to say that there is no connection between the India rubber tree and the prevalence of the insect in and about the house, except perhaps that a colony of the ants was between the roots of the tree when this was transplanted, and that the ants thus became colonized in the vicinity of the house. If the ants belong to some other species, and if it be correct that they were not present before the planting of the tree, the ants are, in all probability, attracted by plant lice or scale insects which infest the tree. In this case the nuisance could be easily abated by killing the plant lice, which is best done by spraying with diluted kerosene emulsion or strong soap suds. The destruction of the house ants, if these have once fairly established themselves in a particular locality, is much more difficult, and I cannot do better than to quote here a passage from a recent paper by myself on household pests, originally published in "Good Housekeeping," May 25, 1889, and reprinted in "Insect Life," vol. ii, No. 4, October, 1889, pp. 106-108:

THE LITTLE RED ANT. (*Monomorium pharaonis* L.)

The "red ant," as this insect is almost universally called, is another of the household pests which we owe to the older civilization of Europe, and, like other domestic pests, it has become almost cosmopolitan. It has been generally considered of North American origin and as one of the few American species which has become widespread in Europe. It is often confounded in the literature of the subject with *Myrmica molesta* Say, which is, however, a synonym. In the larger cities of Europe it is as much of a pest to-day as it is in this country. It probably received the scientific name of "Pharaoh's ant" on account of a defective knowledge of Scripture on the part of its describer, who doubtless imagined that ants formed one of the plagues of Egypt in the time of Pharaoh, whereas the only entomological plagues mentioned were lice, flies, and locusts.

Ordinarily in households this insect is not a nuisance from the actual loss which it causes by consuming food products, but from its inordinate faculty of getting into things. It is attracted by almost everything in the house, from sugar to shoe polish, and from bath sponges to dead cockroaches. It seems to breed with enormous fecundity, and the incidental killing off of a thousand or so has little effect upon the apparent number. A house badly infested with these creatures is almost uninhabitable. They form their nests in almost any secluded spot, between the walls or under the floors or behind the base boards, or among the trash in some old box or trunk, or in the lawn or garden walk just outside the door. In each of these nests several females will be found, each laying her hundreds of eggs and attended by a retinue of workers caring for the larvæ and starting out from dawn till dark on foraging expeditions in long single files like Indians on the war path.

Our first recommendation is to find the point from which they all come. They may have built the nest in some accessible spot, in which case a little kerosene will end a large part, if not all, of the trouble. If the nest is in the wall or under the floor, and taking up a board will not bring it within reach, find the nearest accessible point and devote your energies to killing the ants off as they appear. Where the nests are outside nothing is easier than to find them and to destroy the inhabitants with kerosene or bisulphide of carbon. The nests are almost always in the immediate vicinity of the house. The ants are peculiarly susceptible to the action of pyrethrum in any form, be it Persian or Dalmatian powder or buhach, and a free and persistent use of this powder will accomplish much.

A great number of remedies have been proposed in the household columns of various journals, but nearly all depend upon the use of a mixture of some sort for trapping the ants, and at the best are slow and tedious means of warfare. The best of these with

which I have had any experience consists in placing small bits of sponge moistened with sweetened water in the spots where the ants most do congregate, collecting the sponges once a day or so, soaking them in hot water and then replacing them. Small bits of bread and poisoned molasses or small vessels of lard in which a few drops of oxalic acid have been put have also been recommended, as well as the free use of borax, so often advised for roaches. The people of the Southern States suffer more from these pests than we do at the North, and a Floridian of experience (Mr. C. G. Cone, of Crescent City) recommends a mixture of borax and sugar, well mixed with boiling water, and left here and there on bits of broken crockery. If any one tries this, I should be glad to know the result. A much larger black or brownish ant (*Camponotus herculeanus* var. *pennsylvanicus*) often builds its nests in door-yards so close to the houses that it becomes a great nuisance, overrunning the rooms, and even getting into the clothes, so as to be a personal discomfort. A case was brought to my notice two years ago in Washington, where a fine old homestead was on the point of being sold on account of the annoyance caused by these ants. An investigation showed one enormous nest several feet in diameter in the back yard, and several colonies here and there in other parts of the premises. The large colony was completely destroyed by the use of bisulphide of carbon. A teaspoonful was poured down each of a number of openings, and a damp blanket was thrown over them for a few minutes. Then the blanket being removed, the bisulphide was exploded at the mouth of each hole by means of a light at the end of a pole. The slight explosions drove the poisonous fumes down through the underground tunnels, killing off the ants in enormous numbers. The main source of the trouble being thus destroyed, the nuisance was greatly lessened, and all talk of selling the old place has ceased.

Washington, D. C., June 19, 1890.

Electrical Exhibit at the Brooklyn Institute.

The first annual exhibit of the electrical department of the Brooklyn Institute occurred on the evening of June 21. There were about twenty exhibitors, some of whom had a number of exhibits, so that the hall was fairly well filled with electrical machinery and appliances.

The Edison Electric Lighting Co., of Brooklyn, exhibited a miniature electric lighting plant, showing the three-wire system complete in full operation. Samples of conduits, connections, and other details of the Edison system were also to be seen.

The Perret electric motor was shown in several forms. The Excelsior Electric Light Co., of New York (works in Brooklyn), exhibited a 3 horse arc light motor running a 50 incandescent light dynamo and a 1 H. P. motor. This exhibit illustrated the conversion of a high tension current to a low tension, by the use of a motor and a secondary dynamo. The arc light motor is provided with a very efficient governor, which maintained a uniform speed throughout the evening.

Mr. James Jones, Jr., of the firm of Pearce & Jones, N. Y., exhibited apparatus used in the fire alarm system. This apparatus clearly illustrated the working of this system.

Dr. J. F. Watts showed an improved battery based on the invention of Smee. This new battery is very constant, cleanly and easily managed.

Mr. J. P. Wintringham exhibited apparatus for use in static electricity.

Professor W. C. Peckham had a very interesting exhibit showing the action of a magnet on an electric current. A tinsel cord carrying a current was made to wind itself around a permanent bar magnet, first in one direction and then in the other, by changing the direction of the current. A novel and original experiment shown by Professor Peckham consisted in a suspended disk bearing a series of small bar magnets which were made to revolve around a conductor carrying a heavy current.

Professor P. H. Vanderweyde exhibited and explained several instruments from the large collection recently presented by him to the Institute.

Mr. J. H. Sharpe showed electric gas lighting apparatus in full operation, also a meter gauge for measuring resistances.

Mr. George M. Hopkins exhibited two forms of electrical gyroscope and two forms of Hughes induction balance.

This brief mention does not exhaust the list of interesting apparatus shown on this occasion. The exhibition was very successful, and creditable to those having the matter in charge.

THE State Land Commissioners of New York have granted the applications of the parties interested for river tunnels, namely, the Hudson River Tunnel Railway Company, now in process of construction, for right of way in New York, and the Long Island Railroad Company for right of way in New York for a tunnel to extend under the East River. The commissioners will now appraise the value of the right of way