

Periodical Locusts.

In reply to one of our correspondents who asked information concerning these insects, Dr. C. V. Riley, to whom we referred the inquiry, says:

"In reference to the 17-year locust, or periodical cicada, I may say that in more northern localities the insect appears once in 17 years in a given location, while further south it occurs once in 13 years. In other words, there are two distinct races, one called *Septendecim* and the other *Tredecim*, according as they appear either in 17 or 13 years. There are, however, a number of more or less well marked broods, according to locality. Of these I have tabulated 22, and have indicated in Bulletin No. 8 of the Division of Entomology and in the Annual Report of the Department of Agriculture for 1885, and also in other writings, the exact territory which each of these 22 broods occupies. The State of Indiana has 5 broods, viz., 1885 (XXII), 1888 (V), 1889 (VIII), 1893 (XI), and 1894 (XII). The next brood to appear in Indiana is brood XI, in 1893. The last occurrence of this brood was in 1876, and in that year I had no authentic accounts from Indiana. In 1842 and 1859, however, its appearance was recorded in Sullivan and Knox Counties. In 1894 brood XII will appear. Here again I received no records from Indiana in 1877, but in 1843 and 1860 it was recorded in Dearborn County. The largest brood which Indiana has is XXII, which appeared in 1885, and is due again in 1902. It occupies the entire southern part of the State. This brood is well recorded in Indiana as far back as 1834.

Destruction of Chinch Bugs.

BY F. H. SNOW.

At the recent meeting of entomologists at Champaign, Ill., Dr. F. H. Snow read an interesting paper on the above subject. His experiments have been continued through the two seasons of 1889 and 1890, and have been remarkably successful. As entomologist to the Kansas State Board of Agriculture, I had prepared an article for the annual meeting of that board in January, 1889, stating what was known at that time upon the subject, and calling attention to the investigations of Professors Forbes, Burrill, and Lugger. In June, 1889, a letter was received from Dr. J. T. Curtiss, of Dwight, Morris County, Kansas, announcing that one of the diseases mentioned in the article (*Entomophthora*) was raging in various fields in that region, and stating that in many places in fields of oats and wheat the ground was fairly white with the dead bugs. Some of these dead bugs were at once obtained and experiments were begun in the entomological laboratory of the university. It was found that living, healthy bugs, when placed in the same jar with the dead bugs from Morris County, were sickened and killed within ten days. A Lawrence newspaper reporter, learning of this fact, published the statement that any farmers who were troubled by chinch bugs might easily destroy them from their entire farms by sending to me for some diseased bugs. This announcement was published all over the country, and in a few days I received applications from agricultural experiment stations and farmers in nine different States, praying for a few "diseased and deceased" bugs with which to inoculate the destroying pests with a fatal disease. Some fifty packages were sent out during the season of 1889, and the results were in the main highly favorable.

It was my belief that sick bugs would prove more serviceable in the dissemination of disease than dead bugs. I accordingly sent out a circular letter with each package, instructing the receiver to place the dead bugs in a jar for 48 hours, with from ten to twenty times as many live bugs from the field. In this way the disease would be communicated to the live bugs in the jar. These sick bugs being deposited in different portions of the field of experiment would communicate the disease more thoroughly while moving about among the healthy bugs by which they would be surrounded. This belief was corroborated by the results. The disease was successfully introduced from my laboratory into the States of Missouri, Nebraska, Indiana, Ohio, and Minnesota, and into various counties in the State of Kansas. A report of my observations and experiments in 1889 has been published in the Transactions of the Kansas Academy of Science, vol. xii, pp. 34-37, also in the Report of the Proceedings of the Annual Meeting of the Kansas State Board of Agriculture, in January, 1890.

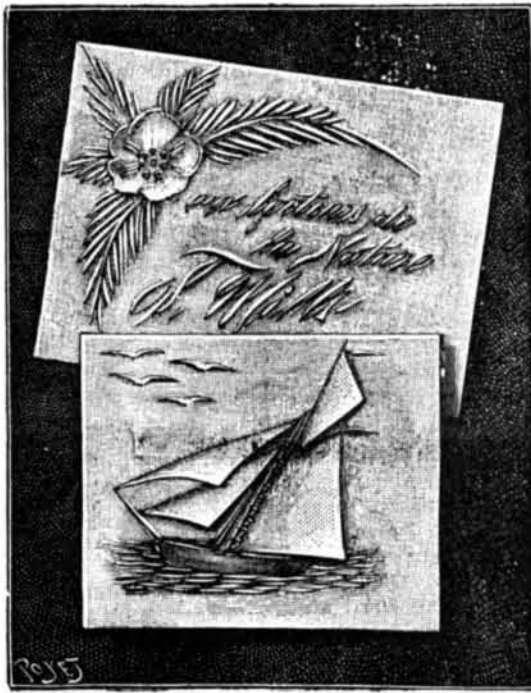
The next point to be attained was the preservation of the disease through the winter in order that it might be under my control and be available for use in the season of 1890. To accomplish this result, I placed fresh, healthy bugs in the infection jar late in November, 1889, and was pleased to note that they contracted the disease and died in the same way as in the earlier part of the season. I was not able to obtain fresh material for the purpose of testing the vitality of the disease germs in the spring of 1890 until the month of April, and then only a limited supply of live bugs could be secured.

The chinch bug seemed to have been very generally exterminated in Kansas in 1889, and only three applications for diseased bugs were received in 1890 up to the middle of July.

CASTROGRAPHY.

Do not look for the word *castrography* in the dictionary, for it is a neologism created to designate a new art. Castrography (from the Greek, meaning to write by cutting) consists in writing or drawing in relief in the substance of a sheet of thin cardboard, by means of the blade of a penknife. It was devised by Mr. Mills, an American, who exhibited the process at Paris in a public establishment. This artist traces the drawing or writing by means of incisions made in the substance of the card. As the knife blade makes a very sharp angle with the card, these incisions may be very deep. In measure as they are made, the operator, with the back of the blade, raises the upper part that he has just cut, so that its outline is at once converted into a sort of bass-relief. On illuminating the card, thus prepared, sideways, it exhibits, in fact, the high lights, tones and half tones and the true and projected shadows of sculpture. As for the rapidity of execution, it will suffice for us to say that the specimens prepared specially before our eyes by the artist, for the readers of *La Nature*, were executed in less than a minute by the watch. (See accompanying figure.) Mr. Mills varies the style of his delicate compositions *ad infinitum*. Here we see flowers, such as eglantines and forget-me-nots, here ornamental designs, and here again birds, ornamental plants, etc., rising suddenly under the blade of the rapid knife. In the time that it would take a draughtsman to put a sketch upon paper, Mr. Mills gives us not only the contour, but also the shadows, obtained by the play of light upon the bass-relief.

This process is scarcely capable of furnishing any-



BASS-RELIEFS MADE IN CARDS WITH THE BLADE OF A PENKNIFE.

thing but fancy work, visiting cards, bills of fare, out of the ordinary line of decoration, etc. A goodly number of our readers who are fond of manual recreations might practice it in their turn. They will find that it is very difficult to incise a sheet of Bristol board without the knife's point passing clear through it, but we believe that with a little exercise, and provided they do not try to work too fast, they will be able to obtain satisfactory results.—*La Nature*.

A Remedy for Cut Worm.

Cut worms are the caterpillars of night-flying moths. Most of them are very injurious to young and tender plants, such as cabbage, tomato, peppers, corn, beans, etc. They only work at night, and during the day remain hidden just under the surface of the ground in the immediate vicinity of their food plants or pastures. Many of the species climb trees, and often become very destructive to the expanding buds and young foliage. The moths of the species that infest our gardens usually lay their eggs near the roots of perennial plants, such as rhubarb, hollyhock, etc., and in the vicinity of such plants we may confidently expect to find plenty of young cut worms in spring. One of the easiest ways to get rid of the pest, says a correspondent in *Popular Gardening*, is to scatter pieces of green stuff, cabbage leaves, or sods with fresh grass, etc., that have been sprinkled with Paris green water, here and there over the area that we wish to clear of cut worms. Hand picking is a more laborious remedy, but it can be made effective. Plow the field, a few weeks before the intended crop is to be planted, and sow some beans over the piece. After the beans are up, the patch should be gone over early every morning, and the cut worms hunted up near the freshly cut plants, and destroyed. If this is done for a week or so, there will be few worms left to trouble the crop to be planted afterward. The worms can also be starved out of a piece of land or orchard by growing several successive crops of buckwheat on it, and allowing no

other plant or weed to grow for an entire season. When mature, the larva enters the ground, where it forms an oval smooth cavity, within which it changes to a chrysalis of a deep mahogany brown color, pointed at the extremity. These chrysalides are often turned up in large numbers when the ground is plowed. Birds of all kinds, and even domestic fowls, are very fond of these chrysalides (as many of them are also of the larvæ), and many are thus destroyed by their enemies, to whose view they are exposed by the plow.

A Electrical Wedding.

At a wedding reported in Baltimore, a few days ago, no sooner had the company been comfortably seated than the room burst into a flood of light from numerous varicolored incandescent electric lamps hidden among the decorations. The entrance of the bride and bridegroom was welcomed by the automatic ringing of electric bells and the playing of electrical musical instruments. After the first course, the room was plunged into semi-darkness, when suddenly, from the floral decorations upon the table, there glowed tiny electric lamps. Not only the flowers, but the interior of the translucent vases in which some of them were gathered, scintillated with flashes of light. After a while a miniature electric lamp, which in some unexplained manner had attached itself to the bride's hair, was seen to glow with dazzling brightness. A toast having been given, two serpents slowly uncoiled themselves and issued from the wine bottle that stood beside the bridal couple. Cigars and coffee were served, and the cigars were lighted by an electric lighter, while coffee was prepared in full view of the company by an electrical heater. The speeches that were made were liberally applauded by an electrical kettledrum placed under the table. As the company dispersed, the electric current set off a novel pyrotechnic display, amid the crimson glare of which the festivities ended.

Caterpillars Stop Trains.

The Carolina Central runs through the Big Swamp just east of Lumberton on trestlework, broken here and there in the solid portions of the swamp by embankments of earth. On April 28 an army of caterpillars began moving out of the swamp, and when they reached the streams, they proceeded to cross on the trestles. The rails and ties were covered several inches deep with the moving mass, and the first train that encountered them was brought to a standstill, the driving wheels of the engine slipping around as if the rails had been oiled. The engineer exhausted the contents of his sand box before he got through the swamp and reached a clear stretch of track.

It was thought that trip would be the end of the caterpillar trouble, but the next day a train encountered another army of caterpillars crossing the trestle, and had the same difficulty. The Charlotte-bound passenger train recently had a similar experience. The rails and cross ties of the trestle were hidden from sight. Where the caterpillars came from is not known. The farmers on this side of the swamp express no uneasiness for the safety of their crops so long as the advancing army persists in using the trestle in getting across the streams, for none of them have got more than half way across before being overtaken by a train.

Preserving Plants.

Mr. J. Sauer has made known a process for preserving plants in the form and with the flexibility that they possessed in the fresh state, and also for coloring or bronzing the plants thus prepared.

The plants having been perfectly freed from dust, and washed, are immersed for two or three days in a strong solution of crystals of soda. The strength of the solution usually employed is eighteen ounces of crystals to one quart of water. Sometimes it is advantageous to add a little caustic lye.

The plants are dried between cloths for three or four hours, and are then greased either by immersing them in melted lard or by gently rubbing them with the hand with olive oil.

To color the plants thus prepared, they are painted with a solution of dextrine containing a proportion of about five per cent of solution of aloes. To this coating are applied the proper colored powders.—*Moniteur Scientifique*.

THE activity and originality shown in connection with the recent development of the American navy affords material for thought, not only to our shipbuilders, but also to our statesmen. Notwithstanding this activity, we sincerely hope that the two great English-speaking nations of the world will never disgrace civilization by going to war with each other. We may say, frankly, that we should have preferred to see America content in developing her industrial and mercantile resources. Since, however, she seems determined to take a position as a naval power, it is the evident duty of our statesmen to make themselves thoroughly acquainted with American naval progress, and to take steps to guard against possible contingencies.—*Industries, London*.