

earth are heaped up around the curbing and pump to check the wind, and frequently when snow is used instead the mass is speedily riddled by numerous blow-holes.

There are periods when these wells blow out for consecutive days and an equal period when they are reversed. This is tested with the flames of candles and by dropping paper, chaff, feathers, etc., into the casing to see it blown out with some force or else drawn in. When the wells are blowing audibly the water rises to a higher level than before, and when the conditions are reversed and air is drawn in, the water is lowered. In the case of many wells a reverse of the current is noticed as it is morning or evening and according as the temperature is high or low.

Experience has taught the people that the blowing of their wells is premonitory of an approaching storm, hence the name "weather" wells. The citizens have elaborated many explanations, some of them as interesting as ingenious, but the generally accepted theory is that the phenomenon is due largely to atmospheric pressure. An elaborate investigation to determine the exact character of these wells will, it is expected, soon be undertaken, under the auspices of the United States government.

THE TRUNCATED MAN.

This remarkable person, who was exhibited in Paris at the time of the Exposition, is one of the rare examples of a human being who has been from birth deprived of his arms and legs; he was born in France in the department of Morihan (Brittany), his father and mother being in easy circumstances and living upon a small farm. Both the parents are of good constitution and physically normal. Their son, now about twenty-five years of age, has no apparent trace



THE MANTIS RELIGIOSA—NATURAL SIZE.

of arms or legs, and hence is generally known by the name of l'Homme Tronc, or Trunk Man. Outside of this remarkable peculiarity, the rest of his body does not present any marked variations from the normal; the head is somewhat large in proportion to the body; the capillary system is but little developed, and the head shows a premature baldness. His parents have always taken great care of him, and he lives in a normal way (apart from the use of his members), as none of the essential organs of life are wanting; he eats, drinks, and digests like another person, but if left to himself he would undoubtedly die, as it is impossible for him to move his body in order to procure food. It may be thought that his condition would react upon the mind, and that he would be of a sad disposition and place but little value upon existence; on the contrary, he seems to be satisfied with life. The writer questioned him upon this point and he responded

that he was quite contented with existence; he does not suffer from want of occupation, as might be supposed, as he has different kinds of work to keep him busy. One of his chief occupations is that of making small tables and chairs, and other objects, by nailing together pieces of wood which have been previously cut out for him. One of the engravings shows him engaged



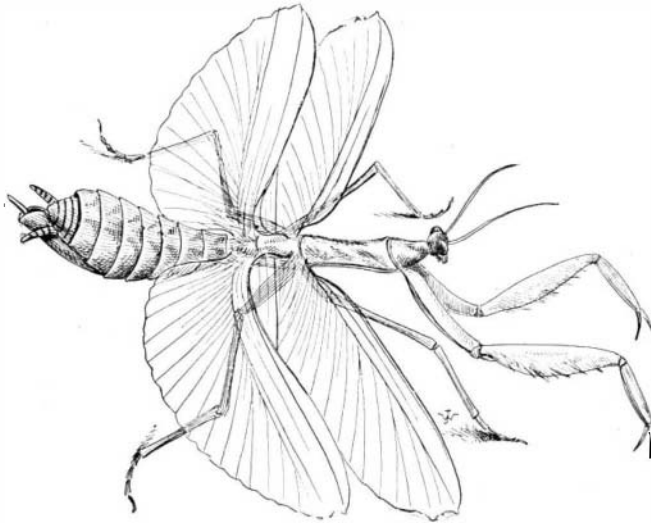
The Toilet.

in this work. He takes a nail in his mouth, plants it in the wood and drives it in very adroitly; he also threads a needle with his mouth, and can take up a glass or metal cup which is given him to drink and empty it without spilling a drop. He seems to be sufficiently intelligent, without being particularly so. At the time of the Exposition he was put on exhibition in a small hall near the grounds. For two of our engravings we are indebted to Lectures pour Tous.

THE MANTIS RELIGIOSA IN ROCHESTER, N. Y.

BY N. HUDSON MOORE.

Some two years ago a farmer living in one of the nearby villages, brought into the city of Rochester some curious growths which he had found on his



MANTIS—NATURAL SIZE.

growing corn. They were identified as egg-cases of a Mantid, and were supposed to be those of the common southern variety, *Stagmomantis carolina*, although it was several hundred miles farther north than any specimens of this insect had been found before. The following year many more of these cases were found. Indeed, in one part of the city, near a school-house, there were so many of them that the children gathered them as playthings, and a small paper-bag full of these cases was given to a nature student for purposes of observation.

These particular cases were gathered during the winter and kept in a warm room. By Easter Sunday the young Mantids were pushing their way out, and, unfortunately for lack of proper food—flies being scarce—several hundred of these valuable insects perished. In the meantime it had been discovered that these insects did not conform to the descriptions of *S. carolina*, and some of the cases were sent to Cornell Experiment Station, where the young were raised. To determine accurately what species of Mantid these newcomers were, some adults were sent to Mr. Scudder, an expert, for identification.

Like everybody else he supposed at first that it was the carolina variety out of its range. But, he says, after trying to run it down to *Stagmomantis*, he turned at last to the Old World tables, and found at once that it was a Mantid, and by comparing specimens, the common European variety, *Mantis religiosa*.

Unlike most of our European importations in the insect world, notably the cabbage butterfly and Hessian fly, this most recent addition to our fauna is a valuable acquisition. It is insectivorous and destroys

large numbers of grasshoppers, caterpillars, mosquitoes, and flies. It is a most interesting insect to observe, even the egg-case itself being quite a notable affair. This is whitey-brown in color, and has a regularity that is very beautiful. Up the center of one side runs a braided effect, which seems entirely wonderful when you consider how the case is made.

The female selects some twig or stem suitable for her purpose, and emits the "foam-like" material which dries and forms the case. She holds it in position and moulds it into shape with her hind legs and the tips of her outer wings. When you hold it in your hand and observe its structure this seems hardly possible, and the eggs are not put in hit or miss, but in a definite manner.

As may be seen from the illustration the case is formed of many scale-like bands overlapping each other. They do not lie absolutely flat, but stand up a little. Underneath these scales the eggs are placed each in its cell, well protected and quite concealed from view. In our first sketch the young Mantids are seen emerging each from his own cell. They bear no resemblance at first to the mature insect, each coming out wrapped in a casing, and looking like a mummy in its grave clothes. It must take a vigorous effort for each little creature to expel itself, and it then remains quiet for several hours till this first skin is shed. After this is accomplished it appears with its full complement of legs, and looking like a tiny edition of the adult Mantid. Over one hundred and fifty were counted as they came from the case, those eggs deposited last hatching first.

It would seem as if each female had done her duty in making and filling one of these cases, but the same one has been known to make two, and one specimen made three, the last one being small and quite irregular, and then she died.

Like other members of the order Orthoptera (which includes the walking-sticks and grasshoppers), these insects are often difficult to distinguish from the



EGG CASE—NATURAL SIZE.

leaves or bushes when they lie in wait for their prey. The Mantid away from its leafy surroundings is showy and large. Its body is long and slender, the first segment of the thorax being of unusual length. Its front legs are powerful members, armed with stout hairs which assist in holding its prey.

Some of the adults are brown, some a leaf green, apparently without regard to sex. They often remain in the same position for hours, with the front legs raised in the attitude of prayer—hence the name—waiting for the first unwary insect which comes within reach. If the insect does not come within seizing distance they crawl, or

rather sidle slowly toward it, and then make a quick pounce, holding the insect firmly in the strong front claws, while it is eagerly devoured. Grasshoppers seem a particularly agreeable diet, and one Mantid will easily dispatch three or four at a meal, beginning at the head and working backward, discarding only portions of the hind legs, wing-tips and some of the internal organs.

We had two of these Mantid in a cage for observation. They lived there peaceably for several days, fed

on a diet of flies and beetles. Just before leaving them for the night several fresh flies were added and matters seemed all serene. Whether a quarrel came up in the night, or whether the fly diet proved unsatisfactory one may not say, but the next morning the green Mantid was monarch of all she surveyed, and in one corner of the cage were a pair of brown forelegs. She probably



Taking an Airing.



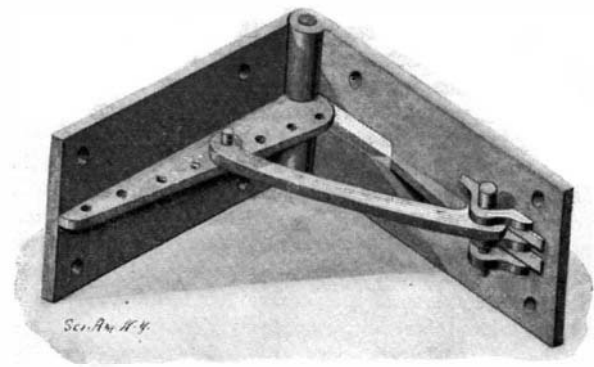
Making Toy Furniture.

THE TRUNCATED MAN.

found them too tough. Notwithstanding their pacific name these insects are fierce fighters, and it is in battle chiefly that the female uses her wings. Then she raises them and springs upon her foe. The loss of a head, or a leg or two, or even a portion of the body does not quench the fiery nature of a fighting Mantid, but they may go on battling in this condition for hours. The females are the larger and hence have an advantage over the males, often devouring her mate as he advances to court her.

The Mantidæ are a venerable family, the name Mantis meaning prophet. According to Anacreon they foretold the coming of the spring, and holding up their forefeet in prayer, were ever supplicating the gods.

Almost all Oriental nations have legends about this singular insect, and in South Africa they are known as the Hottentot's God. The Hindoos venerate its



A LOCKING-HINGE.

supposed powers of sanctity and soothsaying, and indeed wherever this insect is found are also found superstitions which make the killing of one a crime. If one is found in a position of danger it is always carefully removed out of harm's way. Even the "unspeakable Turk" recognizes what greatly resembles an attitude of prayer, and accordingly treats it with respect and attention, believing it a fellow-worshiper with himself.

The only sound we have observed it to make is a sort of scraping. This is caused by rubbing the wing with the hind leg, and seems to be somewhat of the nature of a call to battle.

It is not likely that it will ever be absolutely determined how this valuable addition to our insect inhabitants was brought to Rochester. This city is one of the greatest nursery centers in our country, and young trees and plants are imported in great quantities. Whether the insect came in its adult state, or whether some egg-cases were the means of its introduction, will probably never be known.

It must have been here several years before it was first noticed, for it is found in considerable numbers, and is slowly increasing its area. It has crossed the Genesee, and we found this fall a number of cases in one of our parks, placed as high as four feet from the ground. The egg-cases are made in August, survive the winter and are hatched out the following May, so the greater part of the insect's life is spent in the egg. While it is in the adult state, however, its industry is untiring.

It is interesting to note that in a large nursery near Philadelphia another Mantid has become established. This is an Oriental variety, and a native of China and Japan. Its value is known, and it is carefully protected so that it may increase.

There is no reason why the *Mantis religiosa* should not gain a firm foothold in this country. Geographically it is five or six degrees south of what is its northern limit in Europe. Every creature which helps even in a small degree to keep down the many insect pests like grasshoppers, mosquitoes, and flies, should be encouraged, and we are prepared to welcome this stranger within our gates and make him feel at home.

Telephoning Without Wires.

M. Gautier announces that the first step has been made in the discovery of wireless telephony. He ascribes the discovery to M. Maiche, the French inventor, and the experiments were carried out in the forest of St. Germain. The transmitter was placed in a house on the outskirts of the forest, and it was connected with the earth in the same manner in which lightning rods are connected. Two iron posts, ninety feet apart, connected by wire, were planted in the ground about a thousand yards distant. Voices and other sounds at the transmitter were clearly heard at an ordinary telephone receiver attached to one of the posts. M. Maiche claims that the communication is in a straight line and not by wave current, but by a circuit current, thus enabling a given spot to be aimed at. If the receiver is not placed exactly in the direction given at the current, there will be no transmission, and receivers on either side of the line of transmission will not be at all affected.

A NOVEL HINGE.

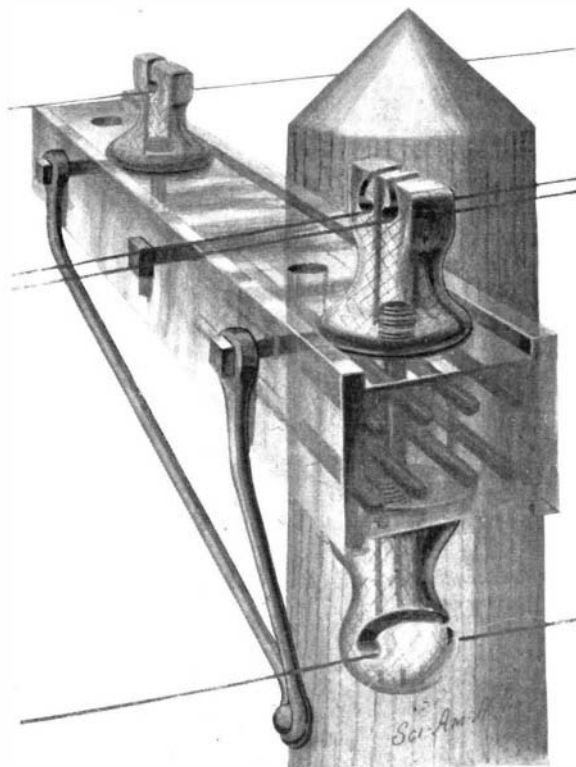
In order that a door may be locked at any point desired, Thomas Wright, of Rome, Ga., has invented the hinge shown in our illustration. One half of the hinge is provided with three superposed lugs, between the upper two of which one end of a lever is pivoted. The other end of the lever carries a pin which can be inserted in one of a series of holes formed in a strip on the other leaf. By inserting the pin in the proper opening of the strip, the door is held open at the proper angle.

Electrical Resistance Metal.

Among the work recently carried on at the Government Physico-technical Institute of Charlottenburg (Berlin) is the study of a new alloy composed of copper, zinc and aluminium, which appears to possess specially good properties for standard electrical resistances. The alloy has somewhat the appearance of brass, and is made by a manufacturer at Achenraiu, in the Tyrol. A metal, to be of value in electrical resistance work, should have a high specific resistance and the coefficient of change of resistance with temperature should be as small as possible; the metal should not form a thermo-electric couple with copper or brass sufficient to interfere with the measurements. The tests made with the new alloy show that its specific resistance is high, lying between 51.70 and 54.08 microhm-centimeters, according to different samples. The temperature coefficient between 18 and 25 deg. centigrade is very small and negative (the metal decreasing in resistance with a rise of temperature); the coefficient lies between the limits -0.00001 and -0.000002 . Measurements of the electrical resistance made between -4 deg. and $+60$ deg. show that the alloy has a maximum of resistance in the neighborhood of 20 deg. centigrade; at low temperatures the coefficient has a small positive value, and at high temperatures a small negative value. The thermo-electric action with copper is very small, this having been found to equal 0.56 microvolt between 20 deg. and 45 deg. centigrade and 0.60 between 20 deg. and 65 deg., for a difference of one degree between the temperature at the joint; this value is exceptionally small, and is less than that of manganin, which is one of the best resistance alloys, the latter giving 1.3 microvolt under the same circumstances, while constantin gives as high as 40 microvolts. As to the change of resistance with time, which is another factor of a resistance metal to be considered, this can only be determined after a sufficient period has elapsed. On the whole, the experiments show that the new alloy possesses valuable properties for the construction of electrical resistance standards, especially for laboratory measurements requiring great accuracy.

A NEW FORM OF INSULATOR.

Insulators made of glass or other fragile material often fall apart when broken and drop the wire. To



THE WOOLBERT INSULATOR.

remedy this evil, Henry W. Woolbert, Box 690, Pittsburg, Pa., has patented a glass insulator comprising two blocks or heads, the upper of which is formed with two incut openings for two wires, and the lower of which is formed with a single incut opening for receiving a single wire. Embedded in each block is a woven wire frame and wires or metal strips. The blocks are secured to a glass arm in which sustaining-wires or metal strips are placed. The device employed

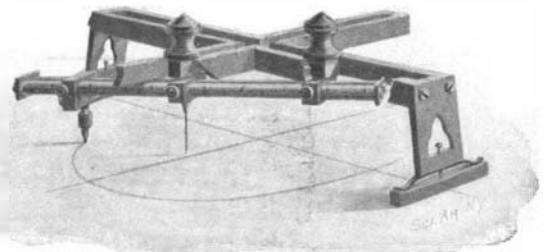
for securing the blocks is a screw-threaded glass bolt, through which wires or metal strips are passed.

By this construction the metal supporting devices are completely insulated from the electric wire. Should any of the glass parts be broken or cracked, the supporting devices will still hold them together.

AN INSTRUMENT FOR DRAWING ELLIPSES.

An ingenious instrument has been devised by Gertrude M. King, of Nantucket, Mass., for describing ellipses with a pen, pencil or cutter.

The instrument consists of a slotted frame, in the shape of a Maltese cross, supported by springs on two standards, so that it can be pressed toward the drawing surface and can return automatically. Beneath the Maltese cross a scribing beam is attached, consisting of two parallel arms, serving as runners for three blocks. The center block, held in place by a screw, covers a needle. The left block can be adjusted along the scribing-beam and clamped by a thumb screw. The right block, carrying the drawing tool, is also adjust-



AN ELLIPSOGRAPH.

able, and can be clamped in any position. The left and center blocks are provided with slide-blocks arranged to move longitudinally in the slots of the Maltese cross.

In using the instrument, two lines are drawn at right angles upon the paper. The right block is then adjusted so that its distance from the left block is equal to one-half the minor axis of the desired ellipse; and the center block is then adjusted until its distance from the right block is equal to half the major axis of the ellipse. The instrument is then arranged with the center point over the intersection of the major and minor axes of the ellipse. The scribing beam is moved with the right hand, while the instrument is pressed with the left. By varying the pressure a light or heavy mark is made. When the pressure has been released, the Maltese cross is carried up by the springs of the standard, so that the drawing tool is removed from the paper.

Count von Zeppelin Honored.

Count von Zeppelin recently delivered a lecture before the Colonial Society in Berlin. He was authorized to announce that the Order of the Red Eagle had been conferred on him, and read a letter in which the Kaiser, after describing Count Zeppelin's achievements as constituting an epoch-making advance in aerial navigation, stated his intention to support the inventor in further experiments by placing the advice and experience of the Balloon Division of the army at his disposal whenever he might desire. Count Zeppelin has certainly earned his decoration, and it is gratifying to see an inventor of a machine for aerial flight so honored, as he necessarily had to brave ridicule for years. Count Zeppelin was very candid in his lecture. He did not disguise the drawbacks of the system—the enormous size of the airship, carrying such a quantity of gas, and the delicate nature of the material of which the ship was constructed—but the fact remains that his airship has successfully attained a great height, carrying with it, in addition to the crew and ballast, provisions sufficient to last over ten days.

Count Zeppelin also has the distinction of having taken part in the famous cavalry raid, in 1870, which was the first blow in the Franco-Prussian war.

The Scientific American an Educator.

For more than half a century the SCIENTIFIC AMERICAN has been recognized as an educator for the old as well as the young. It is particularly gratifying to feel that the youth of the land are being reached and benefited. The following letter was received recently from Mr. G. B. Royer, of Elgin, Ill.:

"A long story short is this: My son, eleven years, over one year ago could not be interested in his school work. We had tried every means. Just why, I cannot say, but one year ago I ordered the SCIENTIFIC AMERICAN in his name. He was interested, became studious, and did so well that his teacher called to ascertain what had been our remedy. I thought I could not afford the paper for the coming year, and my son has earned the money, and wishes to have his SCIENTIFIC AMERICAN continued another year. Please send January numbers."