

A TRAPDOOR SPIDER.

BY C. E. HUTCHINSON.

In many parts of California may be found in great numbers nests of the large trapdoor spider, *Bothriocyrtum californicum*.* The plow has been very destructive of these, but the writer once estimated that, in a certain locality long untilled, there were in a single acre as many nests of large size as there were square yards, while the very small ones, detected with difficulty, were far more numerous. Any but a close observer might walk over fields where these are common without observing a single abode, so perfectly does the door simulate the ground surface, especially when rains are frequent, as the door then becomes completely covered with growing vegetation like that about it.

Specimens of the nests—the upper part, including the door—are familiar objects in the shops of curio dealers, where they are offered for sale along with their stuffed and distorted builders.

Not of less interest than the nest is the life history of its maker. It lives much longer than spiders belonging to most other genera. One year after hatching it measures scarcely 3-16 of an inch in length, exclusive of limbs, while an adult measures 1 1/4 inches.

By measuring the yearly growth of immature spiders, of various sizes, that were kept under surveillance for that purpose for three years, it was found that ten or fifteen years are required for them to reach maturity. After that the spider's life is problematic; but several spiders known to have been adults three years ago are still relatively active. Bearing in mind its very peculiar life, which is one of little action, it is not unreasonable to believe that it may live more than twenty years, all told.



An Adult Spider.

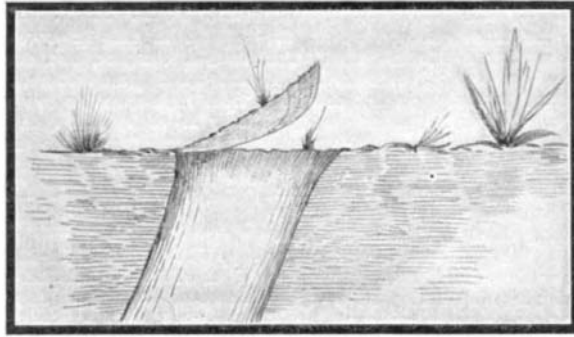
More wonderful than its longevity is the fact that during its entire life, exclusive of the few months passed within the nest of the mother spider, it maintains but a single home, a tunnel in the ground, of its own digging, widening and deepening it as its own growth requires. It will suffer from flood, famine, and devastation rather than abandon the home of its first choice.

Without a knowledge of its habits, the significance of various layers of silk upon the underside of the door of its home is not apparent. The layers, which resemble thin white paper, are closely united, but may be separated with care. They are made one at a time, a single layer covering the entire underside of the door at the time the layer is fabricated. Once each year during the growth of the spider, the door, composed of earth and silk, is enlarged by adding wet earth to its free edge, after which a new layer of silk is applied, extending over the new as well as over the old part. As many as six or eight layers may be removed from an old door, but seldom more than that number, as the older ones disappear by process of decay.

When the door is removed, the spider makes a new one having a single covering. Other layers are subsequently added, even in the case of an adult, but in the latter instance the successive coverings lie wholly one upon another, not being separated at their edges by earth, as the full-grown spider has no occasion to re-enlarge its door.

The operation of making the door is an interesting one, and the entire process may be observed without inconvenience by placing a spider in a box of wet earth. The hinge-bearing edge of the door is perfectly straight upon the upper side, as is also that part of the tunnel's edge to which it is joined. Against a central point on the straight edge of the tunnel's rim the spider first presses a small particle of mud. Being wet it adheres readily, which allows the artisan to

turn about and spread over it a quantity of silk, which makes it more secure. On top of this, and at either end of it, other particles are carefully adjusted in like manner to the rim or to those in place, the operation being repeated until the structure is a third or a quarter of its destined width, when it is pulled over to a horizontal position, the spider presumably sensing



Longitudinal Section of Upper Part of Nest, the Dotted Lines on the Door Showing its Yearly Accessions.

an added security. Further additions to its edge are made by raising the door each time to a vertical position. The growing edge is circular in outline from the start, and is molded to the proper thickness between the fangs and mandibles of the builder.

No silk is purposely applied to the upper side, but the under surface is well smeared with it, the greater part being added a little at a time as each particle of earth is put in place. The word smeared is used because the silk of this spider and others of its class issues from long rows of pores in the underside of finger-shaped organs, which are drawn over a surface from side to side, and more often while in contact.

The employment of plastic earth in making the door makes the fitting of that object perfect; for while it is yet wet it is drawn down into the flaring opening of the tunnel, the soft edges yielding where pressure is greatest. When a door is well pulled down, water may stand over it for several hours without entering the tunnel further than to moisten the wall and its lining.

The heavy earthen door, usually of adobe, with its stout coating of silk, is well suited to protect the designer from insect foes, but in June or July the spider enters upon a period of inactivity which, in the case of those half grown or younger, extends through the summer and autumn or until the so-called rainy season appears; and these younger spiders, as an additional safeguard, barricade the door by packing wet earth against it from within, completely filling the upper part of the tunnel. The lower end of the plug is made dome-like, smooth, and is coated with silk like that covering the rest of the wall.

The adults do not employ a like means, but the immature spiders that are over half grown, and some adults, fasten the door with a quantity of silk applied to the wall of the tunnel and to the door at their line of contact, by which the door is well fastened down.

The protection afforded by these means enables the immature spider to pass through its helpless molting stage unmolested, and the adult female to fabricate her one egg cocoon of the year, and attend it, undisturbed.

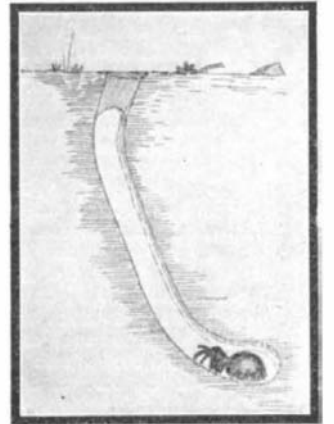
The tunnel in which it passes this peculiar existence is, for the time, practically air-tight, being made usually in heavy clay, or adobe, very hard in summer, and having its smooth wall covered completely with a closely woven and firmly adhering coat of fine silk.

plete reclusion should not be described as lethargic, since it becomes active when disturbed, but it consumes no food whatever for five or six months, nor does it partake of water, unless such is gathered in some unexplained manner from the humid air of the closed cell.

Remarkable as are the natural conditions under which the spider exists throughout the dry season, it is capable of enduring like conditions for a much longer time, as shown by actual test in the case of three adults selected for the purpose. These were kept for sixteen months unquestionably without food, showing no ill effects from the treatment. In this instance proper food was offered at the end of twelve months—the writer not having the heart to continue the experiment longer—but the offering was declined, as the spiders were then enduring the semi-lethargic condition, out of which they emerged in due time, to take food naturally.

SOME NEW ADDITIONS TO THE UNITED STATES ZOOLOGICAL PARK.

Dr. F. W. Goding, United States consul at Newcastle, New South Wales, has secured for the United States Zoological Park the most important collections yet received from any one source, amounting to 140 specimens, among which are a Tasmanian zebra wolf with three young, a Tasmanian devil, three echidnas, thirteen kangaroos of various species, three phalangers, two flying phalangers, four native cats (*Dasyurus*), a black-backed jackal, a pair of emus, thirty cockatoos and paroquets, a wedge-tailed eagle, a pair of black swans, and many other birds.

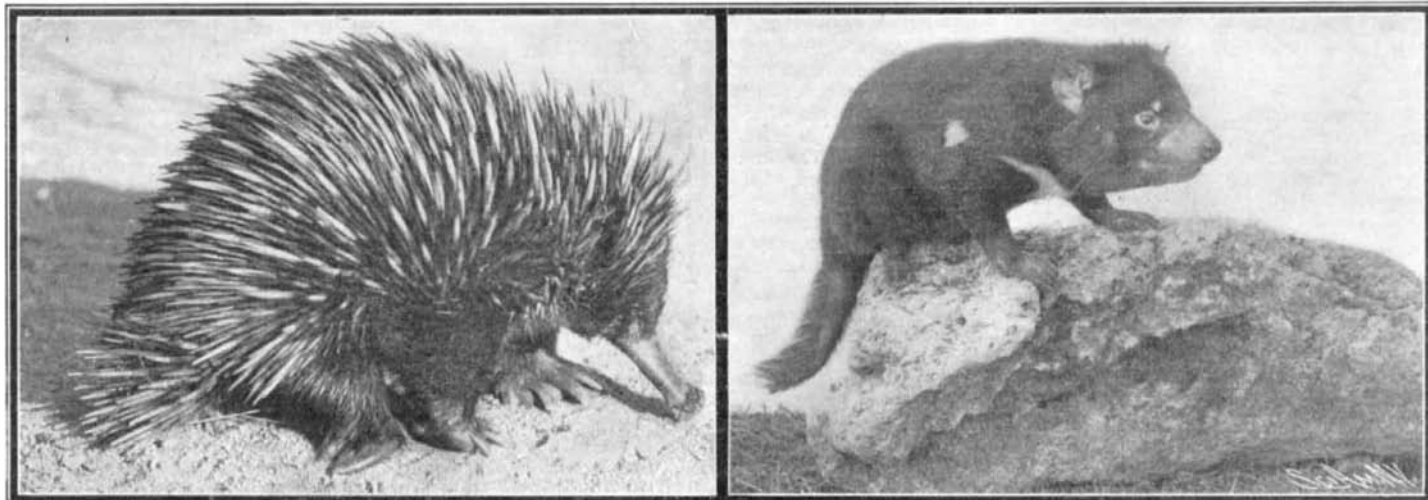


Nest of Young Spider, Showing Closed Door, Plug of Mud and Characteristic Trend of Tunnel.

The echidna, of which a specimen was sent by Dr. Goding, varies in length from 12 to 18 inches. Its broad, depressed body is mounted on very short, strong legs, terminating in big, powerful claws, suited to digging in hard ground. The small head terminates in a nose, which is prolonged into a slender snout. Although the mouth is toothless, the palate is studded with recurved spines. The slender, extensile glutinous tongue is well adapted for the capture of ants and other insects. Stiff, hedgehog-like spines mixed with long, coarse hairs cover the back of the animal. Much like a hedgehog is the animal's habit of protecting the under parts, which are spineless and clothed in silky brown hair, by curling itself up. The animal dwells in burrows of its own digging, and obtains its food by excavating in the hillocks of ants, which it tears open in order to devour the succulent larvæ. The echidna is gentle in disposition, endures confinement well, eats bread and milk, chopped eggs, and the like, and is frequently kept as an intelligent and playful pet.

The Tasmanian devil is a ferocious burrowing, carnivorous, dasyuroid marsupial (*Sarcophilus ursinus*) of thick, massive form with a large head and short, broad muzzle.

Our photographs were furnished by the Smithsonian Institution.



Echidna.

Tasmanian Devil.

NEW ANIMALS IN THE UNITED STATES ZOOLOGICAL PARK.

Though much of the soil in which these spiders live cracks freely during the rainless summer, the cracks do not rupture the wall of the tunnel, which often appears harder than the surrounding soil, and may receive some special treatment in addition to the troweling, or smoothing, which the spider gives it.

The spider's condition during this time of com-

are about half those asked for all others. Attempts have been made to influence the farmers there with the statement that the English machine is much more durably constructed, but it has been found by them that the American windmill answers all demands and lasts just as long as that constructed in England.

* For the name of this spider, I am indebted to Nathan Banks, Washington, D. C.

The windmills seen in South Africa are almost invariably of American origin. It is said to be an exceedingly rare thing to see one of these from England or Canada, and the reason advanced is that the Britishers are unable to meet the prices asked by the American concerns, which