Tarantulas, Scorpions, Not So Poisonous

Entomology

If a tarantula bit you would you die instantly? Will the feet of a centipede leave a row of poisoned blisters where it runs across human skin?

Does the scorpion pack certain death in the sting that it carries on the end of its curled tail?

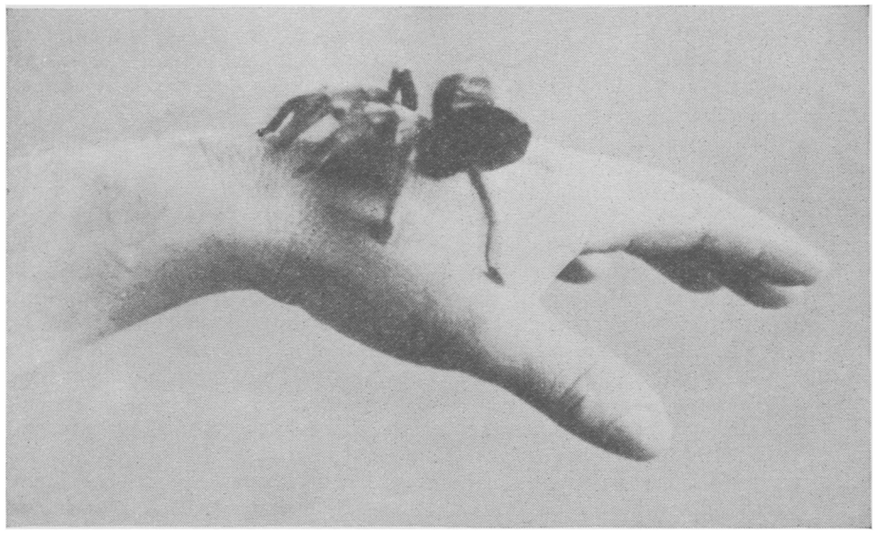
Almost all of us would answer all of these questions with a shuddering "Yes." But in Missouri and points south they have to be shown—and Prof. W. J. Baerg, entomologist, comes from south of Missouri. He teaches at the University of Arkansas and examines insects for the State Experiment Station, and when he isn't busy at those jobs he goes about the American tropics and subtropics, coaxing all manner of fanged and sting-armed "varmints" to bite him. He has survived all their bites and stings; and in the following article he tells us of the things he has learned from this highly personal kind of experimentation.

By W. J. Baerg

A recent newspaper story illustrates how solid a hold the tarantula terror has on the general public. A young man driving in an automobile along a country road suddenly saw a large tarantula on the floor near his feet. Without any hesitation, not even troubling to stop the car, he jumped out. The car ran down an embankment and was wrecked. The man escaped without injury, but he had wasted a good car because of his needless fright. For contrary to the popular notion that they are ferocious and deadly, tarantulas are really very shy and harmless creatures.

I have tried to study the effect of the bite of tarantulas occurring in Arkansas, Texas, New Mexico, California, Durango (Mexico), Honduras, and the Canal Zone. The poison of all these, excepting one, has little or no effect on man. The fangs of a full-grown tarantula are somewhat formidable in size and there is sufficient strength back of them to inflict a wound that is quite painful. Within a period of ten years I have been bitten many times, once or twice by accident; in no case did the effects last longer than from fifteen to twenty minutes. On other people the poison may have more, or less, serious effects. I have not tried the bite on students or assistants. The young lady who does my stenographic work was bitten accidentally by one of the local tarantulas, and the effect was no more that what I have observed on myself.

The exception already mentioned above is a large, husky, blackish species that is very common in the Canal Zone. I found the members of this species especially numerous in Ancon, where they live in holes in the terraces along the streets. After dark they come out to sit in front of the holes, presumably waiting for prey. A bright light suddenly held close to them so dazzles them that they forget to retreat. In this manner I easily secured all the tarantulas needed for experiments.



PERFECTLY SAFE to let a tarantula promenade on your arm. She's usually too sluggish to bite, and even if she does it won't be much more serious than a bee sting

As is true elsewhere, the tarantulas are here regarded as extremely deadly. The natives will scour the woods for all manner of bird and beast to satisfy the tourist trade, even furnish a boa for the drunken sailor, but when I wanted tarantulas and offered a good bonus, I got exactly nothing. One youngster assured me, "I wouldn't touch one of them for fifty dollars."

On rats this black tarantula caused fairly severe symptoms; however, the rat recovered in about four hours. A guinea pig died about thirty minutes after it was bitten. I let one of them bite me on the little finger. The bite caused considerable swelling and fairly severe pain. However, these effects were local, extending no farther than over the hand. After observing the effects for two hours, I ended the experiment by placing the hand in hot water for thirty minutes.

The tarantula that occurs in Arkansas and other southern and southwestern states is fairly common on the hills of northwest Arkansas. It may be found in holes in the ground which it either appropriates, or digs for itself. It also lives under stones.

In the fall, September or October, the local tarantulas mate. Since the species is decidedly cannibalistic, love-making is a dangerous adventure for the male, who is not only the smaller, but also the less deadly of the sexes. But even if he escapes, as he perhaps usually does, he has only his days of decline to look forward to. In four or six weeks he dies, apparently as a result of complete exhaustion of energy, at an age of about eleven or twelve years.

The females Nature has treated more kindly. Maturing at the age of eleven or twelve years, they continue to live and thrive, producing annually a cocoon containing 500 to 1000 eggs. How long they live no one knows. One of the females in the laboratory was taken ten years ago and is still in the very best of health and vigor. Since tarantulas, like birds, do not show their age, the age of this one can only be estimated at not less than twenty-two, and probably much older.

When making the cocoon that is to receive the eggs, the female produces a quantity of silk that is quite prodigious. The cocoon is first laid down in the form of a cradle; on this the eggs are laid and covered with a sheet of silk. The double sheet requires nearly eleven hours of spinning. When rolled up and properly shaped it is about as large as a black walnut from which the hull has been removed.

Tarantulas are (*Turn to next page*)

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easily kept in the laboratory and for various reasons make very good pets. They do not seem to fret over their captivity, like caged birds, and require much less attention than goldfish. During the spring and summer months, April to September inclusive, a tarantula needs for food no more than a good-sized grasshopper, or a large cockroach, or even a caterpillar once every five or six days. From October to March they will require no food whatever provided they are kept in a fairly cool place. Like all other spiders they require a fairly constant water supply; this should be provided all through the year.

The manner of feeding is perhaps of some interest. To begin with, the tarantula locates its prey solely by the sense of touch, for so far as is known, it can see little more than an earthworm. That is, it can merely distinguish the difference between daylight and darkness, even though it has eight eyes. When it becomes aware of the presence of a presumably suitable creature, it rears up and extends the palpi and the first two or first four legs. This is the nearest that a tarantula comes to jumping. If the creature then moves within reach of the legs it is very suddenly struck down to be immediately seized by the fangs.

A grasshopper thus seized is crushed and squeezed by means of the fangs till there is nothing left of it but a little pellet of pulpy material. In this process of squeezing the juices out of its victims the tarantula is exceedingly deliberate. One of my larger female tarantulas when supplied with a large bird locust spent about five hours and fifteen minutes with the repast. While so occupied she allowed herself eleven periods of rest, at more or less regular intervals. The rest periods were of no more than one-half to one second duration.

The only poisonous spider in the United States is the so-called Black Widow. This spider is not nearly so formidable looking a creature as are the big, hairy tarantulas. She is much smaller than the tarantulas of banana-bunch fame; in fact, she is not even as large as many of the orb-weaving spiders whose beautifully designed webs decorate our gardens. Like the orb-weavers, however, she has a somewhat disproportionately large abdomen. She is smooth and quite black. The Black Widow is common south of the Mason and Dixon Line and is present or represented by close relatives in all the temperate and tropical regions of the world. The Russian relative is known as Kara-Kurt, meaning Black Wolf.

The Black Widow is about one-half inch long, shiny black in color, with a dark red hour glass figure on the under side. It lives commonly under stones or logs and in various buildings. In a very dry summer it is often induced to move into basements of houses.

The poison of the Black Widow has a surprisingly mild effect on white rats. In scores of tests made on such rats, I have never succeeded in killing a single rat. Following the bite, a rat will appear ill for not longer than an hour or two, and even during this time it does not register any great discomfort.

On man the poison causes a very severe, sharp pain locally, and a dull aching pain in apparently all the muscles of the body. There is a mild paralysis of the diaphragm as manifested by the somewhat forced breathing and speech. All this is accompanied by a low and variable fever. Not expecting any serious effects, I allowed the spider to give me a relatively large dose, and as a result spent three days in the hospital. Excepting under very unusual circumstances, as for instance, a child bitten in the neck, the effect, though exceedingly painful is, I think, rarely fatal.

Centipedes are commonly known in all the temperate and tropical regions of the world. About 800 different kinds have been studied and named. According to popular opinion, they are all dangerously poisonous; however, investigations have shown that they are probably all harmless, so far as the effect of their poison is concerned. I have tried to observe this effect on various experimental animals as well as on myself. Among the few that I have studied are various kinds taken in Arkansas, New Mexico, Durango (Mexico), and the Canal Zone. Although some of the larger centipedes, reaching a length of 4 to 6 inches, have a somewhat painful bite, and hold on like grim death, the poison has no noticeable effect. The pain resulting from the bite disappears in about half an hour. I have never seen any swelling or inflammation resulting from the poison.

The more or less common belief that centipedes can inject poison by means of the claws on their feet is, of course, erroneous. Even the largest species, attaining a length of 12 inches or more, are unable to puncture the human skin with their claws. There are, furthermore, no poison glands in the legs or feet.

Scorpions are likewise well known in the temperate and tropical regions. In the United States they may be found as far north as South Dakota, but they are common only south of the Mason and Dixon Line. About 300 different kinds are known. I have studied scorpions in the same localities named above under centipedes, and have found all but one relatively harmless. The effect of the poison is mostly local and similar to that of a wasp or hornet. The pain is fairly intense and a small whitish disc appears around the puncture. In fifteen minutes or a half an hour these effects disappear.

As is true in the case of bee stings, some people are more susceptible to the effects of the poison than are others. A fairly large scorpion occurring in the Canal Zone will produce in some persons a general effect, a numb feeling in the legs and arms and a lameness in the tongue, persisting for twenty-four hours. As a rule the effect of this scorpion's sting is less serious.

Another scorpion in the Canal Zone, rather blackish in color, has such large pincers that it appears ill-proportioned. However, these pincers are equipped with strong muscles and the scorpion generally uses them in self-defense, rather than the sting. The latter, suffering from disuse, has dwindled in size and strength to the extent that it cannot puncture the human skin.

The one dangerously poisonous scorpion is the so-called Durango scorpion. It is relatively small, as scorpions go, about two inches in length, and occurs more or less commonly in Durango and various other states of Mexico. Apparently it is most numerous in the city of Durango. The cracks and crevices in the adobe walls and numerous hiding places in various ruins furnish such agreeable shelter to scorpions that they are much more common in towns than they are in the surrounding country.

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Food Excesses Increase Diabetes

Dietetics

The disease, diabetes, is on the increase, in spite of the many lives saved by insulin. And the unprecedented prevalence of this metabolic disorder is attributed by experts of the Metropolitan Life Insurance Company to "the dietary excesses practiced by the American people."

In 1927, shortly after the wide use of insulin became established, medical statisticians were surprised to find an increase in the diabetes death rate. There was a further rise in 1928, and now 1929 bids fair to reach the highest figure ever recorded. The death rate for the first three months of this year, 23.8 per 100,000, was the highest ever recorded among the industrial policyholders of the Metropolitan Life Insurance Company, a group widespread throughout the United States and comprising a considerable percentage of the total population. The large increase was due in part to a wide prevalence of influenza and pneumonia which hastened the deaths of a number of diabetics. But apart from such deaths, there has been a large increase in the death rate from diabetes.

Disconcerting as it may seem to the public, physicians and public health workers, to find an increase in diabetes following upon the discovery and use of insulin, the experts of the Metropolitan Life Insurance Company in interpreting the statistics declare that but for the increasing use of insulin the death rate would be still higher.

The fundamental cause of diabetes is unknown. Some change in the pancreas occurs which reduces its output of a secretion which transforms sugar into a form useful for energy and muscle building. Why the pancreas fails, in some cases, to produce a sufficient amount of this ferment is not known, but the resulting condition is diabetes. Insulin, derived from the islands of Langerhans in the pancreas of animals, has this power of converting sugar into usable form. It supplements the reduced amount of pancreatic secretion of the diabetic, but it does not change the diseased condition of the pancreas itself. It is a treatment, but not a cure and not a preventive. It does, however, enable the patient suffering from diabetes to live out his allotted span of life, usually in a fair state of health and comfort.

The use of insulin has increased, a study of fatal cases showed. According to information obtained from physicians insulin was given in over half the cases, or 63 per cent. of the 1,044 for which data were received.

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fact that they constitute a rather serious menace to the town, the government pays a bounty on all live scorpions brought to the City Hall. This bounty, first paid in 1785, has apparently been offered and paid every year since then. During the scorpion season, March to July, many children devote much time to the business of gathering of scorpions; they are known as *alacraneros*. The number of scorpions brought in annually varies somewhere about 100,000. In 1925, 116,000 were brought in. Since then the number has fallen off, and last year only 8,000 were collected.

In former times, when the doctors had not learned how to treat scorpion victims, the Durango scorpion took an unusual toll of from 30 to 50 children in a city of about 40,000 population. The effect, briefly stated, is a paralysis of the respiratory system so that the victim chokes to death, usually within one or two hours' time. Adults, although they may suffer severely from the effects of the poison, rarely succumb to it.

A somewhat surprising feature about the effect of the poison on adults is that bad characters apparently do not suffer from them. In fact, it is alleged that a scorpion stinging such characters dies itself as a result. One of the generals in Durango assured me that he had demonstrated this fact on himself. I urged him to come to my laboratory to repeat the test, but for some reason he did not put in his appearance.

On experimental animals, such as guinea pigs, the action of the venom is exceedingly rapid. A guinea pig on being stung in the hind leg began sneezing violently (the first symptom aside from the pain) in a few minutes; in about thirty minutes it was dead from convulsions.

The remedies employed in former days were mainly sweat producers and diuretics. More recently chloroform has been used with very gratifying results. Victims are given just enough of the anesthetic to go to sleep, and then kept in this state for from two to three hours, when the danger of convulsions is usually over. Within the last few years a serum has been developed by Drs. Carlos de la Pena and Isauro Venzor of Durango, which has so far given very good results.

During most of the year scorpions are quite solitary. As a rule one finds but one, or possibly two under one stone. Late in the fall they become social; as many as thirty or more may be found under a stone. At this time they mate, and previous to mating they indulge in their mating dances. A male and a female will seize each other by the pincers (that is to say, hold hands) and then walk forwards and backwards in a very regular manner.

The young are born alive, sometime during July and August. The family consists of from thirty to forty young. These on being born free themselves from the thin white envelope that encloses them and then proceed to climb onto the mother's back. She, although normally inclined to seize and devour any small creature, even of her own kind, that comes in her reach, appears to have some real affection for her offspring, assisting them in various ways until they have reached a secure foothold. In the event that any little ones fail to get out of the membranous envelope within a reasonable length of time, the mother calmly devours them. The babies remain on the maternal back for ten days or two weeks, after which they must themselves seek food and shelter.

The popular belief that scorpions when surrounded by fire will commit suicide is, of course, founded on error. Although scorpions are somewhat susceptible to the effects of their own poison, they are but slightly so. One scorpion may sting another to death, but never has one been observed to sting itself.

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