

ZOOLOGY

# Outwitting Vampires and Vipers

## Scientists Working in Tropics Conquer Venomous Snakes And Learn How to Fight Malady of Cattle and Horses

By JANE STAFFORD

WHEN A VAMPIRE is a supernatural creature, science laughs at it. But when it is a disease-bearing bat, science sets its disease-fighters to work seeking a way to conquer it.

Down in Panama, the disease-fighters of the Gorgas Memorial Institute, in addition to carrying on their regular job of fighting malaria, have lately been having a bout with the vampire bats and the vipers that make mischief for the unwary in their tropical neighborhood.

The vampire bat of Panama (the Gorgas Memorial disease-fighters call her *Evangeline the Vamp*) is a small, mouse-sized creature that makes or takes her living from cattle, horses and mules. This would be bad enough in itself, but the Panama vampire has now been found guilty of carrying the disease, murrina, from infected cattle or horses to healthy horses.

Now murrina, also known as *derren-gadera* and *trypanosomiasis*, seems to be a disease of horses and mules but it is related to fatal African *trypanosomiasis* or sleeping sickness of men. That long, seven-syllable word is not hard to pronounce; just put the accent on the second and fifth syllables and you will find it has quite a poetic swing. Both African and Panaman diseases are caused by the same kind of organism or germ, called a *trypanosome*. Consequently when the disease was discovered killing off horses in Panama, the scientists of the Gorgas Memorial Institute Laboratory down here took an interest beyond that of possibly saving valuable herds of horses.

### *Evangeline the Vamp*

*Evangeline the Vamp* did not come into the picture for some time. African *trypanosomiasis* is carried by the *tsetse* fly. Insects play an important role in the transmission of many diseases, a notable example being mosquitoes in yellow fever and malaria. So of course it was supposed that some sort of fly transmitted *trypanosomiasis* or murrina in

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See Front Cover  
Panama. The staff of the Gorgas laboratory was already accustomed to fighting mosquitoes, and it was only natural that they were drawn into the search for and fight against whatever winged insect transmitted murrina.

Dr. H. C. Clark, director of the laboratory, recently told his board of directors how the search for the guilty fly or other insect went on for more than 20 years. The disease, murrina, has been known a long time in Panama and the north coast of South America. In 1909 a scientist named Samuel T. Darling was first in Panama to discover that it was due to a *trypanosome*. Since then scientists have found some mechanical means for the transfer of the disease, but they were unable to prove or disprove definitely that insects might be natural carriers.

They finally had to rule out the insects, except the common horse flies of the region. Circumstances point to them as possibilities, but the fact that the epidemics of murrina were not explosive and did not occur at definite seasons made it seem unlikely that the fly was the chief carrier, if he transmits the disease at all.

### Seemed Like Heresy

So Dr. Clark and his associates next turned their attention to the only blood feeder left that commonly attacked horses, mules and cattle, the vampire bat. It seemed to them like medical heresy to suspect this mammal of carrying the disease. The only other two known mammalian vectors of disease are the dog that transmits rabies and the rat that transmits rat-bite fever. Certain other mammals, including rats, play important parts in the spread of other diseases, but the actual transmission is by insects. Yet Dr. Clark and Laurence H. Dunn of his staff have now established the fact that vampire bats can and do transmit murrina.

They had to circumvent many difficulties before reaching this point, however. For one thing, the vampire bat is apparently a very shy creature, appears only at night, of course, and after eat-

ing, or rather, drinking her fill of blood from her victim, retires to her hideout in some inaccessible cave.

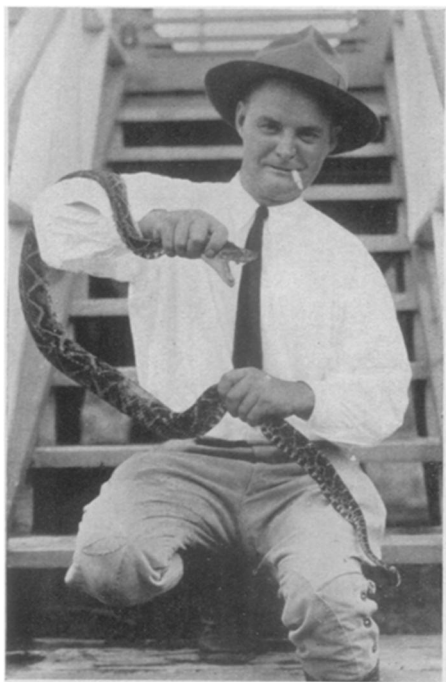
Prior to January, 1932, it had not been possible for the scientists to get more than ten of the creatures, dead or alive, for their study. But during the present year a gruesome clue related to their feeding habits led Dr. Clark's men to the caves where the bats lived, and they were able to secure thirty-two of them in an unharmed state. Studies of these led to the discovery of the vampire's role in the spread of murrina, and incidentally, Dr. Clark and associates were able to throw new light on the habits and anatomy of the creatures themselves.

### Even Attacked Men

For example, these bats have only one young at a time. They will apparently feed on anything that has blood in it. When they attack men, they limit themselves to fingers and toes. Dr. Clark only knew of thirteen persons who had been attacked by this type of vampire, however, as the bats seem to prefer cattle. But they have been known to try to get a meal from a pelican, when they could catch that bird asleep. In such a case, they fed on the web between the pelican's toes.

"*Evangeline the Vamp*" is a little thing, about the size of a mouse and with a face something like a pug dog's. She has not nearly the ferocious look of her cousin the carnivorous and fruit bat of Panama whom the Gorgas Institute scientists have labelled *Constance the Cannibal*. *Constance's* body, exclusive of the wings, is about the size of a quart jar. She has an ugly horn-like excrescence growing out of her nose, and four vicious teeth, but she is probably not nearly so dangerous as *Evangeline*, because, so far as known, she does not carry any disease. Furthermore, she will eat fruit if she cannot get animal food easily.

The vampire can live only on animal blood, her gullet being too narrow for anything solid to pass down it. Her teeth are also peculiar and seem especially adapted to her method of obtaining food. Instead of having two sharp biting teeth at either side, she has a long, slender, pointed one in the middle, admirably suited for stabbing.



#### GREATEST RISK

*A snake farm expert is holding a fer-de-lance, source of greatest danger in Panama because it is most numerous; but its poison is counteracted by an antivenin that is also effective against the venom of other snakes*

She does a neat job, too, making a stab-like incision with her sharp upper tooth as efficiently and with about as little pain as a surgeon might with a blood-letting instrument. When the vampire's bite hurts, it is because the wound was inflicted by a young bat with a tooth not strong enough to strike blood at the first stab, Dr. Clark found. Young vampires must occasionally stab two or three times before getting a meal.

Evangeline is not really a blood-sucker, but, properly, a blood-licker. Her feeding habits are particularly favorable to spreading disease because after stabbing her victim she licks around the wound for an hour or two until satiated. During the course of the licking, she may infect her victim with the deadly trypanosome which is in her saliva. But even if she is carrying the trypanosomes, she may not infect her victim. If she feeds from below the wound, for example, or if she has pierced a vein or an artery so that the blood is running freely, she does not need to lick, but gets enough without. It is the licking process that helps transmit the disease germs.

The vampire bats get the germs into their systems when they feed on infected cattle. The cattle of Panama ap-

parently constitute the chief reservoir of murrina. They may be infected with the germs of trypanosomiasis without becoming ill themselves. Horses and mules commonly graze with the cattle in Panama and are left out in the pastures at night, where bats may attack them as easily as the cattle.

Apparently there is some justice in the situation, for the vampire bats do not escape the effects of the malady themselves. However, they may live and carry the germs in their bodies for a month before dying of the disease, Dr. Clark found. During this time the germs incubate for about ten days and then make their way from the bat's stomach to the saliva. The bat's appetite remains entirely unaffected during this period, so there is ample time for it to pass the disease on to uninfected animals on which it may feed.

As a result of their investigations this year, Dr. Clark and associates were able to advise Panaman horse-owners how to protect their animals from the fatal disease. Horses and mules should not be allowed to range with cattle during the night hours. They should be stabled in barns screened with a wire mesh not greater than one inch, or well-lighted by electric bulbs or clean lanterns. These measures will prevent bat attacks.

"Modern treatment of the disease is now attended with some success," Dr. Clark reported. "We had formerly not been able to save an animal infected with the disease but during the past two years the use of jugular vein injections of certain trypanocides has resulted in the cure of about one-third of the animals in one afflicted herd and of about one-half of the afflicted animals in a second herd."

#### Snake Population Surveyed

Vampire bats, however, are not the only nuisance in Panama, and the Gorgas Institute disease fighters have recently lent a hand in efforts to keep the vipers or poison snakes of the region from making mischief for the unwary. Antivenin, a serum treatment for snake-bite accidents, is rather a specific remedy, it seems. When made from the venom or poison of one snake it may not be effective in treating the bite of some other species of snake.

Scientists who try to protect people from the effects of snake-bite want to know exactly what poison snakes are the chief danger in a given locality. They also want a simple means of distinguishing between snakes, so that a

non-scientific person travelling through the tropics will be able to identify the viper that bit him and thus apply the right kind of antivenin. It is with this identification and snake-population survey that Dr. Clark and associates have recently been lending a hand.

They have collected 1,170 snakes from the valleys of the Chagres, Tuira and Santa Maria Rivers in the Republic of Panama, of which 405 were found to be of poisonous species. This gives an incidence of 34.6 per cent. In other words, of every ten snakes in these valleys, between three and four are poisonous.

Most numerous, and consequently the greatest snake-bite risk, are the fer-de-lance snakes. The bushmaster, however, is said to be the most poisonous, because of the bulk of venom it carries.

Bites from all but the bushmaster and coral snake can be treated by one kind of antivenin. The bushmaster requires a specific antivenin of its own.

#### Identification

Dr. Clark has noted a few easily-remembered distinguishing marks of fer-de-lance and bushmaster. The head of the fer-de-lance is spear or lance-shaped, whence it gets its Spanish name, lance-head. The bushmaster has a goose-shaped head. The bushmaster is brown, and its scales have the same diameter in all directions and a high keel, like an alligator's. The fer-de-lance is black and has feather-shaped scales. Another poison snake of Panama is the coral snake, but there are several snakes resembling this viper in coloring. However, when the black bands of the coral snake are split by a line of light color, the snake is one of the non-poisonous variety. The poisonous coral snake has solid black bands around its brilliant body.

Nature provides a fairly good safeguard against the poison snakes of Panama, Dr. Clark pointed out, in that they are all night feeders. People bitten during daytime hours are very apt to be bitten by a snake that has very little venom left following its night feeding period.

Another of nature's provisions for protection against poisonous vipers is the cazadora, commonly called the police snake. This is a large non-poisonous snake colored a deep navy blue. It can kill all the other snakes and does.

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