

THE MITE AND TICK MENACE

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CURATOR OF INSECTS

That certain small creatures now called insects, mites, and ticks are responsible for much of the discomfort of man's outdoor life must have been as true and as apparent before the dawn of history as now. Only during the past fifty years, however, has it been discovered that a number of these annoying pests serve as carriers, transmitters, or intermediate hosts of viruses,

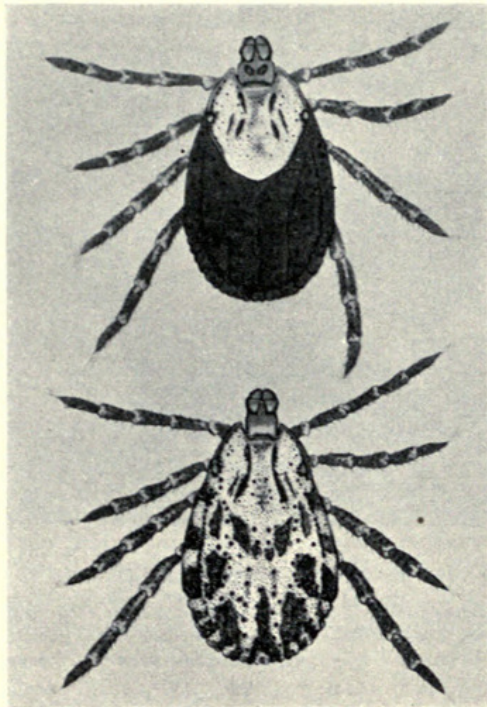


Photo courtesy of National Institute of Health, Rocky Mountain Laboratory, United States Public Health Service

A "PUBLIC ENEMY"

The Rocky Mountain fever tick, cause of a dangerous disease, the mortality rate from which has recently focused upon it the attention of the medical profession. A romantic treatment of the research upon it was presented in the popular novel "Green Light" by Lloyd C. Douglas.

Female (top) and male

bacteria, and protozoans that often cause sickness or even fatal diseases in man and animals. Of the disease-transmitting insects, lice, mosquitoes, flies, and fleas are the most familiar, but some of the mites and a number of ticks are also a menace.

Mites are mostly minute, bean-shaped or sack-shaped creatures with unsegmented bodies. The members of two of the thirty or more families of mites are comparatively large, somewhat flat, and are generally called ticks. With few exceptions, all mites have four stages in their development: the egg, larval, nymphal, and adult stages. Like the spiders, which are close allies, most mites have four pairs of legs in their adult stage.

Of the many modes of life of these abundant and widely distributed little creatures, those that affect the interests and health of man are the most noteworthy. Among them are the mites that are predaceous on injurious insects; those that are destructive

to plants, trees and food products; and those that as parasites attack man and animals.

The mites destructive to vegetation are the kinds that feed on the sap of fruit trees and clover, the leaves of beans (red spiders) and other economic plants, or on bulbs and garden flowers. The cheese, ham, and flour mites, which bring forth their young alive, are troublesome pests in Europe and North America. Farm animals often are the victims of species that have parasitic habits. Some of them are the scab, mange, and follicle mites that attack cattle; and the feather, scaly-leg, and depluming mites that live on poultry and other birds. Long-known parasites of man and domestic animals are the itch mites. They burrow into the skin and cause intense itching which, if not promptly treated with a sulphur ointment, develops into a disease called scabies or "barber's itch."

TEMPORARY PARASITES ON MAN

In the eastern half of the United States there are mites that often prove very troublesome as temporary parasites on human beings. They are known as red bugs or chiggers. In their minute larval stage they crawl generally on the lower half of a person's body and attach themselves by means of their specialized mouth parts. In a few days they become engorged with blood and nymph, and drop off. However, much irritation, severe itching, and more serious complications often result from their attacks. The adult red bugs are predaceous mostly on insects. Harvest or grain mites can also be regarded as temporary parasites upon man. Normally they are predaceous on insect larvae that feed on farm products, but harvest hands and those who handle insect-infested farm products are sometimes attacked by them. A day or two afterwards, their temporary host may have a widespread rash accompanied in severe cases by fever, nausea, and headache.

The members of the two families of mites generally called ticks include about fifty different kinds that live in the United States. All of them are external parasites on vertebrate animals. Five are known, and more are suspected as transmitters to man of a number of disease-producing organisms. Some species feed and pass their different stages on one host; others require two, three, or more hosts for their full development. Their food consists wholly of blood and nymph, but, when none is available as is the case generally during the winter, they can live without nourishment for many months. So well fitted are most ticks for their blood-sucking habits that care must be taken in removing them, to prevent the mouth parts from separating from their bodies and remaining anchored in the skin of their hosts.

That ticks can be the vectors or transmitters of disease organisms was demonstrated for the first time in 1893. Two investigators, Messrs. T. Smith and F. L.

Kilbourne, of the United States Department of Agriculture, discovered that a particular species of tick in the southern states was the vector of a protozoan (a single-celled animal) that produces a serious and often fatal disease in cattle and other domestic animals in Texas and adjoining states.

These Texas fever ticks, as they are called, are single host parasites. They pass their different stages on one animal, finally mating and dropping to the ground where the females lay their eggs. As there is no successful way of curing the afflicted animals, the best method for checking the disease is to kill the ticks on their hosts, and to prevent the parasites from spreading into other parts of the country by quarantine regulations. In this manner the pests have been greatly reduced in number, and the area of their distribution has been restricted. In Europe other species of ticks have been found to be responsible for a disease similar to the Texas or redwater fever.

THE SPOTTED FEVER TICK

The discovery that a certain kind of tick was indirectly responsible for the red-water fever which was once widespread among cattle in Texas led investigators to believe that some of the diseases of man might be due to the feeding habits of similar parasites. As a result of the investigations of the late Dr. H. T. Ricketts and his associates, it was ascertained in 1906 that a species of tick was the transmitter of an organism that caused the sickness and death of many persons in the northern Rocky Mountain states. Later, careful studies and experiments made by the National Institute of Health (United States Public Health Service) in its Rocky Mountain Laboratory at Hamilton, Montana, and by investigators of various other institutions, disclosed the intricate life-history of the Rocky Mountain spotted fever tick and its surprising status as a disease vector.

This important parasite proved to be a three-host tick that requires two to three

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years for its development from the egg to the adult stage. Its range of distribution is now known to extend from New Mexico and Arizona northward to British Columbia and Alberta. For a week or two the larvae feed on small mammals, primarily rodents, and, after becoming engorged, they drop to the ground, molt, and change into the nymphal stage. The nymphs likewise live on small mammals and they finally also leave their hosts, molt, and become adult ticks. The adult parasites in turn feed mostly on large mammals, and it is in this stage that they attack man. Large mammals seem to be immune to the results of these tick bites, but man, monkeys, and guinea pigs are not. The human death rate from western spotted fever varies in different localities from 5 to 85 per cent.

The organisms that the Rocky Mountain fever tick transmits are called Rickettsi bodies which some authorities believe to be a virus. Rickettsi bodies are found in a number of species of small mammals and they serve as natural reservoirs for the virus. By means of their eggs the ticks can pass the virus to the next generation.

OTHER DISEASES FROM TICKS

Recent investigations have disclosed the fact that the western spotted fever tick and four allied species are at least partly responsible for the transmission of four other organisms which cause the diseases known as tick paralysis, tularaemia, relapsing fever, and Colorado fever.

It is now well known that spotted fever occurs not only in the west, but also in the middle Atlantic states, especially Maryland, Virginia, and North Carolina. The eastern strain of this disease seemingly is less virulent than the western, the fatality of authentic human cases averaging about 20 per cent. It was only in 1931 that the American dog

or eastern wood tick was found to be the vector of the spotted fever virus in the east.

The American dog tick is a three-host parasite that apparently has an irregular distribution in the United States and southern Canada. During its different stages it feeds on a variety of domestic and wild animals. It is commonly found on dogs and it often attaches itself to man. In Illinois in 1939 two human cases of spotted fever were officially reported and believed to be the results of the bites of dog ticks that had fed on two infected sheep. Besides being a vector of the spotted fever virus, the common wood or dog tick also transmits the bacteria causing tularaemia, a disease common in rabbits.

There is sufficient evidence to prove that the attacks of a number of species of ticks both in America and abroad have serious and often fatal results to animals of economic importance, and to man. All tick bites, therefore, should be given prompt and careful attention.

EXPEDITION TO ECUADOR

Mr. Donald Collier, recently appointed Assistant Curator of Ethnology, is leaving September 1 to spend five months in Ecuador supervising for the Institute of Andean Research a program of archaeological investigations in which Field Museum is collaborating. The project is sponsored by the Co-ordinator of Commercial and Cultural Relations Between the American Republics.

Although little archaeological work has been done in Ecuador, extensive prehistoric remains are known to exist, and it is expected that an archaeological survey will yield important results. The expedition hopes to gather information which will tie up the archaeology of Ecuador with that of Peru to the south and Colombia to the north.

Ecuador was conquered by the Incas in the 15th century, and the most recent archaeological remains there pertain to the Inca civilization. But there is also evidence, in the form of elaborate pottery, gold and silver objects, and intricate stone carving, that important civilizations existed in Ecuador before the coming of the Inca conquerors from the south. It is the aim of the expedition to study these earlier cultures and to attempt to relate them to early Indian civilizations that flourished in other parts of the Andes.

**Change in Visiting Hours
Begins September 2**

Field Museum visiting hours, which have been 9 A.M. to 6 P.M. daily during the summer months, will change to the autumn schedule—9 A.M. to 5 P.M.—on Tuesday, September 2, the day after Labor Day. These hours will continue until October 31. On November 1 the winter hours, 9 A.M. to 4 P.M., will go into effect.

THINGS YOU MAY HAVE MISSED**Closest Relative of Elephants
is a Rabbit-sized Animal**

The dassie (also known as hyrax, and cony or coney), an animal only about the size of a rabbit, is the closest living relative of the elephant. However, in appearance it resembles a nondescript sort of rodent. When its anatomy is examined it proves to be related to the rhinoceroses and horses, as well as to the elephants!

A small habitat group of these odd little creatures which live in Africa (the North American cony of our west is no close relative) is on exhibition in Carl E. Akeley Memorial Hall (Hall 22). The specimens were collected in Ethiopia in 1926-27 by the *Chicago Daily News*-Field Museum Abyssinian Expedition.

The relationship of the dassie to the elephant is established by its internal characters, and more especially by the structure of its feet. The molar teeth are strikingly like those of the rhinoceros. The size and general appearance of the dassie

**DASSIE OR CONEY**

Related not only to Jumbo, but to rhinos and horses.

would lead the average layman to assume that it was a rodent, but actually the little animal belongs, as do both the elephant and the rhinoceros, to the great assemblage of ungulates or hoofed mammals. Its real systematic relations are with the primitive fossil hoofed animals of Eocene age that had five fingers and five toes, and it would be quite correct to refer to the hyrax as a "living fossil."

The dassie has the distinction of being mentioned in the Bible under its other common name, coney: "The coneys are but a feeble folk, yet make they their houses in the rocks" (Proverbs: 30th Chapter: 26th Verse). By the natives of Ethiopia the dassie is called "chekoko" which resembles in sound the curious chattering call which makes the rocky hill habitations of these little animals extremely noisy.

Remarkably modern in design is an ancient Roman bronze bathtub, from Boscoreale, exhibited in Stanley Field Hall.



Gerhard, William Josiah. 1941. "The Mite and Tick Menace." *Field Museum news* 12(9), 4-5.

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