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MUST THE WORLD MUZZLE THE FLEA?

Magnified Picture of a Flea

Until It Does, the Terrible Plague May Not Be Suppressed

BACK of an insignificant-looking news item, sent out from San Francisco recently, lies one of the most startling chapters dealing with recent discoveries of science.

It was stated, simply, that the municipal health authorities had raised the bounty scale on rats to a maximum of fifty cents a head, as another step in the way to exterminate bubonic plague in that city.

Yet it is not the rat, per se, but the flea on the rat that San Francisco—the civilized world, in fact—is after.

For science has found out that the terrible outbreaks of plague from which the world has suffered from its early history—one of which, having devastated a large part of India last year, is now sweeping through Arabia and menacing mankind everywhere—have been due to infected fleas and that rats have carried these dread little disease arsenals from place to place.

It's a companion story to that of yellow fever and the mosquito.

To preserve itself from the terrible plague, must the world now muzzle the flea, as it made war upon mosquitoes to banish yellow fever?

TRACED as far back in authentic history as the destruction of Sennacherib, when, "as it came to pass, that night the angel of the Lord went out and smote in the camp of the Assyrians an hundred fourscore and five thousand," the Spirit of the Plague has moved over the earth, breathing pestilence and death, and leaving devastation in its train.

Shrouded in the repelling mystery of its sable wings, the pestilence has moved over Asia,

Europe, Africa; it has appeared and disappeared mysteriously, only to rise again from the dust of the dead time and again; naught availed to stop its ravages.

In one section of India, within the first six months of 1907, there were no fewer than 1,000,000 deaths from this disease. It was this virulent outbreak, which is yet counting its victims by thousands in Asia, that aroused science to a final, desperate effort for relief.

Just as a surgeon, after examination, can place his hand upon the gangrenous spots upon a human body, so scientists can place their hands, virtually, on the leprous sores of the earth—the plague centers of the world, where the dread disease festers, at times dormant and again raging in all its virulence.

There are four spots where the plague has originated during centuries, to which nearly all the epidemics can be traced—places which, if it were possible, it might be well to wipe off the map. They are Garhwal, in northern India; Mesopotamia, in Asia Minor; Assyria, in southern Arabia, and Yunnan, in China. Uganda,



The Four Great Plague Centers of the World

periments have proved without doubt that this bacillus is the cause of the plague. But how is it conveyed from rats to men?

"In the case of the Black Death, we read that the disease was communicated by the sick to those in health, and seemed daily to gain head and increase in violence just as fire will do by casting fresh fuel on it; that the contagion was conveyed by approaching the sick too closely, or by merely handling their clothes or anything they had previously touched."

"Such a description would seem to indicate that the poison might be propagated by the breath or by the touch of infected persons; experiments did not sustain this theory, and the

idea was first proposed by Simonds that the real transmitters of the virus were fleas.

"This theory, which explained the conveyance of the disease to the healthy from infected persons, has been supported by experiments by Gautier, Raynaud and Dr. J. Ashburton Thompson. Some convincing experiments were made by Captain W. G. Lister, I. M. S., who found that 61 per cent. of white rats and 52 per cent. of Bombay rats contracted plague from fleas which had been fed upon infected rats."

Dr. Brunton described experiments made by Captain Lister with guinea pigs. His experiments showed that guinea pigs placed in houses protected from fleas did not contract the plague, while pigs which were attacked by infected rat fleas succumbed.

In the stomachs of fleas taken from infected rats were found the bacillus pestis, the germ of the plague. Chinese pigs confined in cages hung a sufficient height above the ground to escape the fleas remained unharmed; those in cages surrounded by fly-paper, which caught the fleas as they attempted to jump to the cages, remained uninfected.

These experiments, declared Dr. Brunton, were confirmed by the advisory committee appointed by the secretary of state for India, the Royal Society and the Lister Institute. The Lister Institute conducted experiments and decided that wherever fleas are present an epidemic immediately starts in a region where the plague breaks out.

CATS TO COMBAT PLAGUE

It was also discovered that 90 per cent. of the animals examined were bitten on the neck, and of 179 rats examined fleas were obtained from the heads or necks of 65.3 per cent.; and finally, that these rat fleas bite human beings.

Dr. Brunton says: "Possibly the introduction of more cats in plague-infected districts might be useful; Colonel Buchanan has found that wherever there are many cats there is little or no plague."

"A plague in India affords constant opportunities for its spread along channels of commerce, and especially along steamship routes. Cases of plague arrive from time to time at the port of London, and, although precautions may be taken to isolate the sick, rats may become infected, creep along ropes to the shore, and, by infecting other rats, begin a pestilence."

"This pestilence, for a time, might remain limited, but it would eventually spread along railway lines to all parts of the country. By allowing rat and flea infected districts to exist in the East End of London, we are in daily danger of infection by plague."

The discovery that the flea carries the plague, asserted the eminent physician, is a worthy follower of the discovery that the mosquito has been the carrier of yellow fever and malaria in the tropics. Bitten by mosquitoes while traveling in the vicinity of Suez, in 1868, Dr. Brunton suffered from malaria for many years. He declared that he had come across one case—that of a patient aged 65 years—in whom the germs of the disease had remained latent for thirty-two years.

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Burning Bodies of Plague Victims in Bombay

in east Africa, has almost reached the unenviable record of these plague spots in Asia.

From these places within the past ten years the plague has been distributed to various parts of Asia, the southern coast of Africa, Japan, Australia, South America and to this country.

Alarmed by the spread of the disease and its ravages in India, Sir James Crichton Browne is agitating in London the formation of a National Society for the Destruction of Vermin. Before the London School of Tropical Medicine, Sir Lauder Brunton, of St. Bartholomew's Hospital, London, declared that the flea is one of the most deadly enemies of the human race and the chief disseminator of the plague.

"Although the connection between mortality in rats and plague has been long observed," he said, "it is only recently that its nature has been ascertained. The germ which occasions plague is a short, thick coccus-bacillus, with rounded ends, to which the name of bacillus pestis has been given. It was discovered by Kitasato and also by Yersin. Numerous ex-



Pilgrims to Mecca Bathing in a Sacred River, a Fruitful Source of Contagion