MEDICINE

Hemorrhagic Fever War Rages

Northeast Bolivia has become the prey of a strange dry-season disease called hemorrhagic fever, and one small village has been completely abandoned because of it.

By FAYE MARLEY

➤ A DEADLY unconquered disease is being tracked down in the fertile but wild mountainous areas of northeast Bolivia in South America, and American medical scientists are at last hopeful that they will overcome the virus infection that kills one in three who contract it. No vaccine has yet been developed, and no cure is known.

How the disease is spread is still a mystery, but the call of the Bolivian Government for help in fighting it has been answered by U.S. Public Health Service disease fighters who are risking their lives, as did others before them in subduing yellow fever and other tropical diseases.

The disease is hemorrhagic fever, "black typhus" to the Bolivian natives. Already three U.S. Public Health Service (PHS) workers have contracted the malady. But they survived to continue their search for the "carrier" through which the disease is spread.

Suspected Carriers

Suspected vectors, as sources of the spread are called medically, are rodents and bats and water or food polluted by such animals.

Dr. Karl M. Johnson, Dr. Ronald B. Mackenzie and Angel Munoz, a medical technician, caught the fever while collecting a strange assortment of insects. All three are on the staff of the National Institute of Allergy and Infectious Diseases, Bethesda, Md., which helps sponsor studies of the Middle America Research Unit, called MARU, in the Panama Canal Zone. They were sent immediately to Gorgas Memorial Hospital in the Canal Zone for medical care.

Their clothing was covered with insects, but the men are not sure if this had anything to do with how they got the virus, which in humans is called Machupo.

Last year, MARU investigators first recovered the Machupo virus from people with the disease. Intense laboratory investigations showed that the virus is responsible for the infection and also that it is related to two other organisms—the Junin virus that caused hemorrhagic fever in Argentina, and the Tacaribe virus, taken from an animal in Trinidad.

One advantage the three U.S. Public Health Service men see in having suffered through the disease is that they are now immune and can carry on further studies without fear.

The only treatment thought to be helpful aside from the usual supportive measures, is convalescent gamma globulin, taken from persons who have had hemorrhagic fever. One of the men went into shock but was revived, and none showed signs of the type of coma that means approaching death.

Their symptoms varied from mild to severe, but all had high fever, chills, aching and other characteristic symptoms such as trembling tongue.

For the past two and a half years the eyes of many medical researchers and economic developers have been focussed on this disease problem, because in addition to killing hundreds and causing untold human misery among those who live through the illness, it has slowed up development of the fertile Beni Province.

Migration Encouraged

The Bolivian Government has been trying to encourage migration of the arid Alti Plano population to Beni's more favorable climate. The possibility of hemorrhagic fever spreading to more densely populated areas of eastern Bolivia is a real danger.

So far, no danger of the disease spreading to the United States is seen unless a carrier is found that implicates man-to-man transmission of the malady.

Dr. Johnson is now director of MARU, replacing Dr. Henry K. Beye. Dr. Beye died of heart disease in April. He was awarded posthumously the Order of the Condor of the Andes, one of Bolivia's highest decorations at a ceremony in San Joaquin, where a hospital has been named in his honor.

But now the research continues to find the carrier, and to perfect a vaccine.

Among researchers recently joining the work is Ed Tyson from Florida State University. Under a grant from the U.S. Public Health Service, he will make his study on bats the basis of his Ph.D. thesis.

A rat-like animal, sometimes called a "rouse" although it is a mouse, has definitely been identified as harboring hemorrhagic fever virus but this does not identify him as a carrier. More than one carrier is possible.

In San Joaquin, 50 miles south of the Brazilian border, Mr. Tyson and six helpers captured 5,000 bats.

Wildcat With Wings

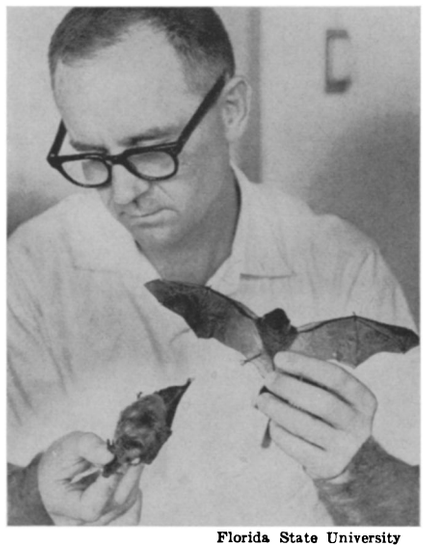
"It's just like catching a wildcat with wings and with teeth that bite just as hard," Mr. Tyson said.

Blood samples of bats and their external parasites are being analyzed in the MARU laboratory to determine whether the bats actually carry hemorrhagic fever.

Mr. Tyson is a veteran of scientific expeditions to Canada, Alaska and Panama, and has studied differences in raccoons in Florida and Alabama to classify the varieties living between the Apalachicola and Aucilla Rivers.

The bat study in Bolivia was undertaken as a secondary project this year. Mr. Tyson originally set out from Florida State University in January under a grant from the Smithsonian Institution and Sigma Xi, scientific society, to study the altitudinal distribution of bats in western Panama.

On Jan. 9, 1964, rioting broke out in Panama City, and Mr. Tyson and Frank Chapman, another Florida State biologist, packed their gear in a jeep and started for the mountains 300 miles away. They were warned of the riots and given police escort to the docks, where they "hijacked" a skiff and headed out to the shipping lane five miles off the Aguadulce shore.



Florida State University

BATS DEADLY DISEASE CARRIERS?—Ed Tyson, doing Florida State University Ph.D. thesis research in Bolivia, is trying to find out whether bats spread unconquered deadly hemorrhagic fever. He has trapped 5,000 bats in a U.S. Public Health Service field study.

After reaching the Canal Zone again, Mr. Chapman left for the States and Mr. Tyson went on to Bolivia for the bat study. He went first to La Paz and then to San Joaquin.

San Joaquin's population was 3,000 in 1962; it has been reduced to 1,600 persons. Several hundred died of Bolivian hemorrhagic fever and hundreds more fled the village.

Working closely with a medical team, Mr. Tyson went into all of the village's mud brick houses. In 56 of them he found between 10 to 2,700 bats living among the tiles, palm or grass thatched roofs.

The villagers were not concerned about their bat neighbors, but Mr. Tyson found

31 species and caught two kinds of vampire bats, a type that lives on blood alone.

Nets Catch Bats

Mr. Tyson set up fine black mesh nets—two at each of the houses in the afternoon. His team collected bats from sundown till 10 o'clock each night. They also set up nets in the streets and made collections from 24 village grass-grown lanes, as well as the forest and brush areas near the town.

Using gloved hands, the team caged the bats and took them to the laboratory, where blood samples were taken from some of them. Also being studied as possible carriers are fleas, ticks, mites and mosquitoes.

Hemorrhagic fever was first noticed in Bolivia in epidemic form in 1960 in the small settlement of Orabayaya in the northern section of the country. It was thought to be a form of typhus, carried by the louse, but when patients failed to respond to treatment the Bolivian Government sent out its call to the United States for aid.

Dr. Mackenzie was sent to Bolivia. Since Orabayaya had been abandoned, he spent his time at a temporary hospital in the nearby town of Magdalena, which he said was infested by millions of bats.

Officials at the National Institute of Allergy and Infectious Diseases told SCIENCE SERVICE that the disease had died down considerably since elimination of rodents from San Joaquin and the abandonment of Orabayaya.

Dr. Merle Kuns, a virologist and ecologist with the National Institute of Allergy and Infectious Diseases, started the study to determine the role of bats in the epidemic. But he and Dr. Ned H. Wiebenga have also helped to isolate the virus in the "rouse," called scientifically *Calomys collosus*.

Assisting the studies of the Institute of Allergy and Infectious Diseases at the Middle American Research Unit are the Bolivian Ministry of Health, the Pan American Sanitary Bureau and the Caribbean Command of the U.S. Army, including Walter Reed Medical Center researchers.

Meanwhile, deaths from the disease, mostly among the very old and the very young continue. But new findings are raising hopes that soon a definite carrier and a life-preserving vaccine will be found.

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MEDICINE

Rabid Bats Increase

➤ A WARNING on the danger of an increase in rabid bats has been sounded following a medical study on the spread of the disease.

In the New England Journal of Medicine 272:75, 1965, four doctors stated that rabies-infected bats are now present in 44 states, including many areas heretofore free of the disease-ridden bats, and predicted that all 50 states would be infested eventually.

The researchers said further study is necessary to determine the extent to which bats infect other "rabies susceptible" animals. There is, however, no question of their ability to spread virus to comparatively distant geographic locations.

The study was concentrated in southern New England. The doctors further warned against handling bats and urged that all bat bites be reported to authorities. They emphasized that all bites should be considered rabid until proved otherwise, and the biting bat should be captured for testing if possible.

Since the presence or absence of the disease in bats can be the only basis for bat-rabies control, at least five states have conducted studies to find the extent of the disease. Control is by post-immunization after exposure in humans and immunization before exposure in pets.

Positive infection is often difficult to establish because it may occur infrequently at first. For example, scientists in Florida examined 3,984 bats and found eight infected bats.

Massachusetts was for many years free of rabies, with no cases of human infection since 1935. In 1958, a study of 218 bats in the Taunton-Middleboro section of southeastern Massachusetts showed no rabies. Then in 1961, a woman in Harvard, Mass., was bitten by a rabies-infected bat.

Bats were collected for the Massachusetts study from July 1962 until December 1963. The rabies-fluorescent-antibody test on rats was most successfully used, although several other tests were tried and found to be less accurate.

In the rabies-fluorescent-antibody test, urine from the suspect bat is injected into a mouse brain. Upon autopsy, a search for antibodies is made in the mouse brain using fluorescent light through an ultraviolet filter.

The research was conducted by Drs. Kenneth F. Girard, Geoffrey Edsall and Robert A. MacCready, all of the Harvard School of Public Health, Boston, and Dr. Harold B. Hitchcock, Middlebury College, Vermont.

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MEDICINE

Alcoholics Respond To Make-Believe Pill

➤ ALCOHOLICS who are made to think they are being treated for the discomforts of withdrawal in many cases bear up as well as those who get drugs to ease them over the "cold turkey" anguish.

A study comparing the effects of two tranquilizers and a placebo, which has no medicinal ingredient, suggests that "the benefits produced by active drugs added only slightly to the major benefits produced by the therapeutic environment."

All the placebo patients were able to carry on through the three days of the study with no ill effects except for one case of delirium tremens. The test group consisted of 58 men, from 28 to 59 years old, who had been drinking heavily from five days to several months before the tests began.

The study, which took place at the clinic of the Alcoholism and Drug Addiction Research Foundation in Toronto, was reported in the British Medical Journal, 1:92, 1965, by Dr. G. Sereny of the Foundation and Dr. H. Kalant, professor of pharmacology at the University of Toronto.

The researchers cautioned, in light of the effect of a placebo, that "it is all the more important to weigh carefully any additional benefit conferred by an active drug against the hazards which it may involve."

Librium, the most recent drug used for alcohol withdrawal symptoms, was compared with a typical phenothiazine tranquilizer, promazine, or Sparine.

Both drugs were more effective than the placebo in promoting sleep and diminishing sweat, but the men quickly developed tolerance to promazine so that it had no effect on them.

Although Librium appeared to be the better drug for treatment of these patients, the investigators say that it "constituted a relatively small addition to the placebo effect."

• Science News Letter, 87:75 January 30, 1965

Nature Note

Winter Wren

➤ THAT SMALL perky bird scurrying around in the underbrush like a mouse is a winter wren, one of the tiniest and toughest members of the beloved wren family.

With its short blunt tail held at an absurdly cocky angle over its back, this stocky dark brown bird about four inches long never seems to sit still.

In perpetual motion, this fascinating combination of timidity, curiosity and cockiness hops, creeps and climbs around thickets, vines, rocks and overturned tree roots searching for insects, grubs and insect eggs.

Its scientific name, *Troglodytes troglodytes*, meaning cave dweller, alludes to the affinity of the wren for creeping in and about dark recesses. Like a fluffy striped ping-pong ball, this bright-eyed bird pops into holes and crevices in a twinkling, only to reappear a few feet away.

Of the 63 species of wrens in the world, the winter wren is the only species found in Europe. Preferring the colder climate of the Northern Hemisphere, the winter wren is also found in Iceland, Asia, Japan and the Aleutian Islands, as well as in North America from Canada to the Gulf Coast. Other wrens prefer the warmer climates of the tropical Americas.

This busy bird carries on soft monologues of chirps, scoldings and chatterings, although, like all wrens, it sings with a marvelously melodious bubbling song, best heard in the stillness of a cool forest.

• Science News Letter, 87:75 January 30, 1965