



**RABID FOX**—Note how eyes are dilated, as is typical with this disease. Not clearly shown are the animal's teeth, several of ← which have been broken off by the frantic biting at the metal cage. This animal, while confined in an animal-proof and vermin-proof cage, placed inside a bat cave, was infected after exposure to the air of the cave. This air-borne infection has amazed scientists.

(Photo courtesy of Dr. Denny G. Constantine, Southwest Rabies Investigation Center, U.S. Public Health Service)

centered on control of the disease in dogs. Dog licensing and vaccinating campaigns are an annual affair in towns and cities, which may seem to suggest that rabies control is primarily an urban effort.

While it is true that most dogs live where the most people are, there is good reason to recognize the problem in rural areas, also. This is because the virus that causes rabies will infect not only dogs and people but any warm-blooded animal.

#### **Increase in Wild Animals**

A dog properly inoculated with live rabies virus vaccine modified by passage through chick embryos will develop an immunity that protects against exposure for at least three years. Widespread use of this vaccine during recent years may account for a nationwide stabilization of the incidence of rabies among dogs. In contrast to this comforting knowledge is the fact that rabies among wild animals has been increasing. This makes rabies important to all people who live close to nature, not only farmers and ranchers, but lumbermen, campers, hikers and picnickers.

Rabies virus multiplies only within living animal cells and has almost no ability to survive outside the host. The virus is spread by means of bites, though scratches from claws freshly contaminated with virus-laden saliva may do the job. The chain of events that keeps rabies virus alive is broken if the infected animal bites another that is immune, or if the infected animal dies or is killed before passing the virus on. Humans and herbivorous animals, if infected, are usually dead-end hosts.

#### **Incubation Period Varies**

Once the virus is introduced into susceptible tissue, the incubation period starts. This is the interval following infection before symptoms appear. It varies from 10 days to 8 months in man, averaging 30 to 60 days.

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# RABIES IN ARIZONA

**Raymond E. Reed**

Rabies was a disease well known to our ancestors. It remains one of our most important present day diseases of animals transmissible to man.

The "mad dog" typifies our mental picture of a rabid animal, and because the dog associates so closely with man, prevention of human exposure has

Dr. Reed is Professor and Acting Head of the Department of Animal Pathology.

## Agricultural Minerals Sold in Arizona — 1963

	Tons Sold
Gypsum .....	15,913
Lime sulfur solution .....	2,650
Sulfuric acid .....	1,419
Soil sulfur .....	2,074
Iron sulfate .....	195
Zinc sulfate .....	26
Miscellaneous .....	1,078
<b>Total .....</b>	<b>23,355</b>

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## Rabies

For animals, the average incubation period is three to eight weeks, with extremes of 10 days to six months. During incubation the virus progresses along nerve fibers to the brain. Damage to brain cells is indicated by onset of disease signs. The virus also travels peripherally from the brain to other tissues, such as the salivary glands.

Animals may develop "dumb" or "furious" rabies. Either manifestation is preceded by a day or two of subtle changes in temperament. Nervous, shy dogs may become friendly, or the affectionate dog may show bad temper. The stage of excitability follows. If this stage is short, and paralysis develops quickly, then the case would be classified as one of dumb rabies. Lower jaw paralysis, the "dropped jaw," is the most obvious sign.

### "Furious" Rabies

If excitability progresses through irritability and a tendency to wander, then to vicious aggressiveness, the disease assumes its most dramatic character. The animal may at this time attack anything that moves, biting and retreating or clamping down and refusing to let go. Teeth may be broken from biting hard objects. Inability to swallow properly leads to drooling and the collection of foam around the mouth. A spine-tingling howl is common. Paralysis follows excitation, succeeded by death in a day or two.

Rabid cattle, horses, and mules generally show excitement. Cattle paw, butt and bellow, but seldom bite. Horses and mules kick, paw and bite.

Last year was an alarming one in Arizona, considering that there were 78 cases of animal rabies confirmed by



## JULY

13-17—Western Regional Plan Exchange Conference — Desert Inn, Tucson

27-31—State 4-H Roundup — U of A Campus, Tucson

## AUGUST

12-14—FFA Leadership Conference —U of A Campus

## SEPTEMBER

14-18—State 4-H Advisory Committee, U of A Campus, Tucson

laboratory test. Only one of our 14 counties failed to contribute to the total. The border counties produced 24 rabid dogs, indicating that the problem that first appeared in the Yuma-San Luis area in 1962 was still with us. There were 18 rabid wild animals recognized, including one mountain lion that severely injured two men and a skunk that entered a house to bite a sleeping man. For every rabid wild animal recognized there are 10 to 100 not discovered.

### Is Always Fatal!

Each year hundreds of Arizonans are victims of animal bites, only a few of which are inflicted by rabid animals. Rabies is always fatal once symptoms develop, so it doesn't pay to gamble on the question of whether or not the biting animal was rabid. If an animal is rabid and has virus in its saliva when it attacks, it is only a few days from death.

Every effort should be made to capture it for quarantine and subsequent laboratory examination of brain tissue to confirm the diagnosis. At the same time, people should not expose themselves to further bites in the process. Wild animals usually must be shot, and even here brain examination is important, for anti-rabies treatment for the human is unnecessary unless the animal which bit him is rabid. Shots should be placed in the body. Brain tissue shattered by a bullet is of no diagnostic value in the laboratory. The head of a suspected wild animal that has inflicted bites should be taken to the nearest state health laboratory as soon as possible. The bite victim

## Agric Teachers Honor Frank Adams of Douglas

Frank W. Adams, who has just completed his eighth year of teaching vocational agriculture at Douglas High School, has been named the outstanding Arizona teacher of vocational education.

The award was made by Alpha Tau Alpha, professional fraternity of agricultural educators. Adams was chosen from among the 42 vocational agriculture teachers who are employed in the 35 high schools in Arizona which have such training.

Presenting a plaque to Adams was Raleigh A. Jobs, president of the University of Arizona chapter of the fraternity.

must immediately contact a physician.

Quarantine of pet animals that bite provides the opportunity to observe for development of symptoms and to assure the availability of the animal for confirmatory diagnosis, should it die. Many people, especially children, must be treated for rabies as a precaution just because the biting animal wasn't identified and quarantined.

### It Can Be Controlled

Control of rabies is entirely dependent on breaking the chain of virus transmission by the immunization of dogs and cats, the capture of unowned pet animals, and by wild-life population control. Cheerful cooperation with requirements for pet vaccination, and with area quarantine requirements during times of high rabies incidence, is in the best interests of the public health.

*At all times people, children in particular, should be wary of the stray pet or wild animal, above all the wild animal that is acting abnormally. The wild animal that fails to flee the presence of humanity is not behaving normally.*

Bats noticed flying during the day, or found sick on the ground, are to be avoided by children and approached with caution by adults. Rabies is with us and shouldn't be minimized, but modern control methods are reassuringly effective.

Treatment for those unavoidably exposed is now far less dangerous and painful than in the past and, most important of all, is effective if received in time.