

PUBLIC HEALTH

Meet Mr. Rat

Night vandal and plague carrier, the long-tailed rodent also supplies thousands of laboratories with a scientific research animal to the benefit of mankind.

By BARBARA TUFTY

See Front Cover

► OH RATS! Oh *rattus rattus rattus*!

Nibbling, gnawing, killing, squeaking, trailing deadly diseases, contributing vital data for laboratory research—these long-tailed, sharp-toothed, intelligent rodents have followed man into his dwellings around the earth.

Brown rats, black rats, white rats, water rats, roof rats, kangaroo rats, pack rats, sand rats, desert rats—call them what you will, these members of the rodent family are now firmly entrenched over one-half the world's land surfaces. In fact, no other mammal except man holds equal territory. If an accurate census could be taken of the exploding rat population, rats might prove to be the most numerous mammals on earth.

Rats weren't always so prevalent. A few bones have been found dating back to the Stone Age, and several ancient records mention these creatures. But in the 12th century, they began to swarm through the houses of Europe, coming from the East. During the Crusades, more rats were brought into Europe on ships returning from the Holy Land.

Many Controls Tried

People of the Middle Ages tried many controls—traps, drowning, singeing their fur or putting a bell around their necks in the hopes the bad smell or noise would drive away the other rats. Professional rat catcher guilds were established, and a good rat catcher was an honored man about town. Special privileges were granted to those who could present 5,000 tails.

But still the rats spread, and with them spread the fearsome bubonic plague, the Black Death of the Middle Ages, which reduced Europe's population by a quarter. During the plague year of 1665 in London, 100,000 persons died.

Grim reminder of the ever-present threat of this plague came late in February from San Francisco where a dead rat was found infected with the bubonic plague bacillus. It was a "domestic" rat, explained Public Health officials in Washington, D. C., that must have wandered out of city limits and become infected by a wild rodent. No other evidence of bubonic plague has been discovered in the alerted area.

Typhus has been transmitted to man from the lice of rats for centuries, and may have changed more history than all the kings, czars and emperors of the world. Amoebic dysentery, infectious jaundice and rabies are other diseases spread by this uninvited guest in our cities. In less than ten centuries, dis-

eases from rats have killed more people than all the wars and revolutions of history.

It is strange but true that many of the same characteristics making rats so hated by mankind have helped make them excellent pets or specimens for laboratory work. Originally the rats selected for a house or laboratory were albinos of the common brown rat, but now they have been bred and rebred to produce an almost standard rat whose white coat and pink eyes are far more agreeable than his dark cousin, and who does not have such nasty habits.

Scientists prefer these white rats because they do not cost much, they need only a small space, they eat almost anything, the time span of generations is short, they have large litters and they are easy to handle.

Followed Westward Migration

Rats may have landed on American soil from ships during the American Revolution. In their own sociable manner, the animals followed the pioneers and migrations westward, states Wilford Nelson, assistant chief of predator and rodent control, U.S. Fish and Wildlife Service, Washington, D. C. Now they are spread out throughout the United States in numbers that equal if not exceed the human population.

One reason this unwelcome companion continues to stay so close to man is because we make them so comfortable. Our houses are their houses; our food is their food; our mess delights them; and all our efforts to kill or decrease their numbers are thwarted by these wary prolific animals.

They quickly adapt to almost any condition. Exterminators say that an old veteran can master any kind of trap—by avoiding it, or by kicking it around or dropping it until it snaps, then leisurely eating the bait. He can smell and avoid most poisons, and his prolific and promiscuous mating habits keep the rat population high.

Life Span Up to Five Years

With a life span from three to five years, rats can breed every month in the year. Average number of babies in a litter run from six to nine, depending on the species—although when food is abundant, litters as high as 23 have been recorded. One estimate is that with ideal food and health conditions, a pair of rats could produce 350 million descendants in three years!

Rats are willing to eat anything or gnaw through anything—paint, shoes, soap, rubber. Even though an adult rat can eat 50 pounds a year, it is not the actual eating that causes the heavy destruction of man's supplies—it is the rat's sloppy habits.

The animals take random bites from potatoes, apples, carrots—just enough to con-

taminate the food hopelessly. They gnaw holes in grain and corn sacks and the polluted contents spill over the floor. They steal hen eggs, and kill more baby chicks than they can possibly eat. In one night, 188 chickens of frying size were killed by a few rats.

Rats use their teeth at least half their waking hours, experts grudgingly agree. With four peculiar incisors that grow about four inches each year, rats just have to keep gnawing on things to file those teeth down.

If a rat cannot gnaw, or if one of his incisors gets out of line, the tooth keeps on growing down into his jaw or up into his head and causes death. So they must constantly rip, cut, grind.

Gnaw Continually

The four front teeth of a rat grow so fast that he must constantly be grinding and filing them down. That is why Mr. Rat, seen on this week's front cover, is one of the most unwanted mammals in the world, as he carelessly gnaws through food, walls, doors and aluminum sheeting in an effort to keep himself alive.

Rats have been known to cut through lead pipes, apparently curious about the running water inside, and a half-inch sheet of aluminum was gnawed through, as well as four inches of concrete. They have gnawed holes in dams and started floods. They threw part of a city into darkness by stripping off the rubber insulation from electric wires and causing a short circuit.

The three rats that plague us most, reports Mr. Nelson, are the common *Rattus norvegicus* or the Norway rat; the *Rattus rattus alexandrinus* or roof rat; and *Rattus rattus rattus* or the black rat that frequents ships and docks.

The Norway rat, which is also called brown rat, water rat, sewer rat, house rat and many another name, is a vicious fighter and has generally exterminated its smaller cousin, the black rat, whenever it arrives in a new area. This rat now dominates the land everywhere it has traveled, except in tropical and subtropical areas. The Norway rat gets its name from the popular and probably fallacious belief that the species arrived on timber ships from Norway.

One rat can cost a farmer \$24 or more each year, estimates David O. Quinn, entomology specialist at West Virginia University, Morgantown. An average farm may have a large population of these rodents, and annual costs run into the thousands of dollars of food damage—to say nothing of damage to nerves and humor of farmer.

Good ratproofing and control can reduce the chances of rat invasion by 80% or more, states Clyde R. Madsen, rodent control specialist with the Bureau of Sport Fisheries and Wildlife at Gainesville, Fla.

All of the rats' hidden travel routes should be sealed off, he recommends. Rats like to travel under cover, and they often enter houses through holes left around water

pipes, electric wires and air conditioners. They prefer to make their paths through broken windows and torn screens, and through the holes they gnaw in walls or floors.

These private runways can be blocked off by fitting three-eighths hardware cloth over the holes, and forcing the rats into the open.

Anticoagulant bait should be placed along their regular travel routes between nests and food supply. This bait, mixed with cornmeal or rolled oats, contains a basic chemical that thins the blood and causes an internal hemorrhage. It should be kept fresh

and in plentiful supply, for rats must feed on this for five to ten consecutive days before the chemical can have its full effect.

Another method of getting rid of the pests is to give the buildings and yards a good housecleaning. This means eliminating trash and junk piles, keeping weeds and unnecessary vegetation cut to the ground, repairing leaky water faucets, putting a lid on the garbage can, stacking unused lumber, baling empty burlap bags and properly storing machinery or equipment not in use.

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ANTHROPOLOGY

Voodoo and Politics

Voodooism still widely spread among the Haitians, both in the city and rural areas, may be a powerful political weapon, useful to gain popular support—By Elizabeth Mirel

► **VOODOO DRUMS** are beating in the background as tensions rise and politics explode on the island republic of Haiti.

The Haitian peasants, nearly 90% of the population, keep up their practice of voodoo in the untamed Haitian countryside.

Throughout the history of Haiti, Christian priests have joined forces with the Government to wipe out the pagan religion. They said the spirits that came to possess the people were evil, and they took away the people's drums and other ritual objects.

During the mass political revolts, strikes, business shutdowns and incidents of mob violence that marked Haiti in 1957, Dr. Francois Duvalier, rising to power, was charged by his rivals with voodooism. Late in 1957 he became, as he is now, president of Haiti.

President Duvalier, a scholar of voodoo who has published many articles on the subject, turned against the church and removed many officials.

Fighting the church may have been a way to ally himself with the peasant masses, Dr. Erika E. Bourguignon, Ohio State University anthropologist, told **SCIENCE SERVICE**.

It is "entirely possible" for Duvalier to use his knowledge of voodoo for political ends, she said.

"It may easily be a way of trying to get rural support," she said.

But the picture is not clear cut, for there is more misery and more repression now than earlier in the Duvalier regime, Dr. Bourguignon said. The harsh conditions may nullify his appeal to the masses.

Many observers agree with this picture. Haiti is the poorest of the Latin American countries. It has a 90% illiteracy rate. The peasants live at a near-starvation level. The land is overpopulated: there are nearly 1,000 persons for every square mile of arable land. Malaria, tuberculosis and the diseases of malnutrition go unchecked. Medical services are scanty.

Often the peasants turn to voodooism to alleviate their misery. They seek out the voodoo priest or priestess, the hungan or the mambo, for cures. They ask for a successful crop. Although the priest collects

his fees, the peasant is not assured of health or success. But the peasant clings to his belief in the powers of the priests, for he has nothing else.

In traditional voodoo religion, power comes from the spirits, loa, that enter into a person's body when he is in a trance. They drive out one element of his soul, the gros bon ange, and take possession of his being. They do their work for good or evil through the body of the possessed.

The city dweller, as well as the rural peasant, has faith in voodoo. He finds it hard to shake off belief in what he would like to think is merely superstition. It is the lower class urban dwellers who spend the most money for voodoo, Dr. Bourguignon said, and their ceremonies are the most complex.

In the cities and in the countryside the military domination and police terrorism of the Duvalier regime are increasing. A poorly organized revolt against the regime was crushed in July, 1958.

Now, as uneasiness and unrest continue in Haiti, Dr. Duvalier, the voodoo scholar, may find religion is no longer an adequate outlet for the dissatisfied masses.

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SOCIOLOGY

Family Trouble Can Hit Anytime, Anyplace

► **TROUBLE** can come to any family, anytime, anyplace.

Problems with marriage, in-laws or children, troubles with sickness or injury can afflict a family without warning, often causing serious disorganization.

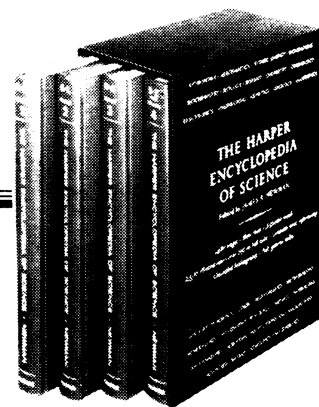
The causes of today's special problems and the various kinds of help available to families are reported in a new Public Affairs pamphlet.

The pamphlet, *When a Family Faces Stress*, is available for 25¢ from the Public Affairs Committee, a non-profit educational organization in New York. It was issued in cooperation with the Family Service Association of America.

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