

# RATS TO THE RESCUE!



**Y**OU ARE trapped under rubble in pitch-blackness. Then you hear the squeaking of approaching rats. Snor you spot one with a camera and light on its head and a tiny speaker around its neck. "I see you," a voice crackles on the speaker. "Help is on the way!"

Just another triumph for rescue rats! Scientists are outfitting the furry creatures with miniature electronic equipment and programming them to locate disaster victims in tiny, cramped spaces that could not otherwise be reached.

The robust rodents receive signals sent by humans who control where they go as if they were playing a video game.

"It takes about 10 days to train rats to go left or right," says Dr. John K. Chapin. "Next we teach them to go over a barrier. We guide them up and down stairs, tents or fences. They learn quickly once they get the idea of, 'Oh! You want me to climb!'"

Dr. Chapin and an international team of colleagues are perfecting the use of rescue rats at a State University of New York laboratory in Brooklyn, N.Y.

Rats have many advantages over rescue dogs. They are smaller and can get into places dogs can't. They climb easily, see perfectly in the dark and have an even better sense of smell than dogs.

The idea of using them on search and rescue missions came to scientists after the



**RESCUE RATS** are outfitted with miniature electronic equipment to help them locate victims.

tragedy of September 11. "We realized rats could be guided into places where humans or dogs could never go," said Dr. Chapin.

"We program the rats rather than train them. It's all done with electronics."

Under anesthesia, hair-thin wires are embedded in specific areas of the rat's brain. The wires are capped with plugs allowing electricity to run from a battery into the rat's brain.

The plugs are cemented onto the rat's skull. Then the rat is given a tiny backpack with a battery, receiver and computer chip allowing scientists to control the animal by



**RESEARCH TEAM** on the project includes scientists from the United States, China, Russia and India.

laptop computer and joystick.

Signals sent to the receiver trigger a sensation in the rat -- making it feel as if it were touched on either its left or right whisker. When the rat moves in the direction it feels touched, it is rewarded. Scientists send a signal that literally gives it a charge out of life -- by stimulating the pleasure center in its brain.

A small camera on the rat's head allows scientists

## SCIENTISTS PROGRAM FURRY CREATURES TO SEARCH FOR DISASTER VICTIMS

**NIMBLE RODENTS:** Because of their small size, rats can get into places that rescue dogs can't.

to see what the rat sees and steer it like a remote-controlled toy car. A two-way speaker hung from the animal's neck will let rescue workers communicate with trapped victims.

Animal rights experts are taking a hard look at the project -- but the researchers insist the rats are comfortable and well cared for, says project scientist Dr. Sagar Talwar.

"There is no pain," he assured. "The brain has no pain sensors. The rats are quite happy. Other lab rats live in little plastic boxes, but these guys get to run all over the place and go outside in the grass and get to climb trees." Scientists are still ironing out some wrinkles in the system. Rats move fast, which can result in video images that change too fast. Technology is being developed to correct the problem. The researchers also need equipment that can generate electrical signals powerful enough to penetrate duck rock and debris and not fade out like a car radio in a tunnel. But they are confident that in just a few years, search-and-rescue rats will be released in swarms at a disaster site, all connected by a wireless network. They will quickly penetrate every opening and in less than an hour rescue workers will be able to locate trapped persons.

Progress is being made so rapidly that scientists are already looking ahead to existing new uses for the rats.

"Someday we'll be able to read a rat's brain and turn it into a biological sensor," said Dr. Talwar. "An alarm will go off if the rat smells explosives in luggage at an airport. A cage of rats may one day replace airport X-ray machines. Nothing man-made can approach the power of a rat's nose."

— LANCE LAYTNER