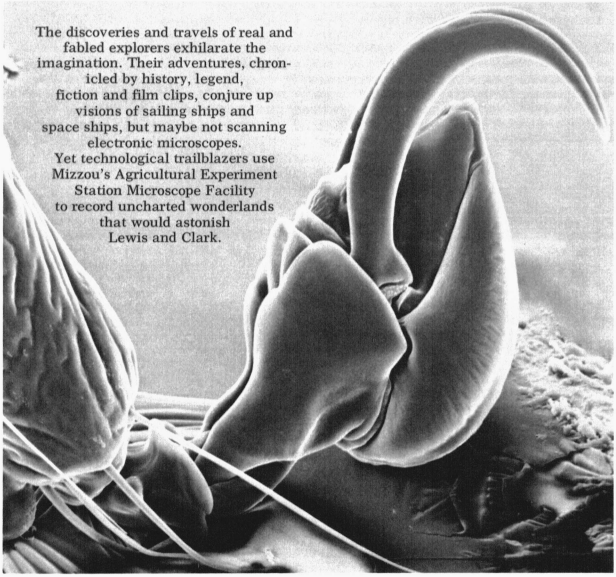
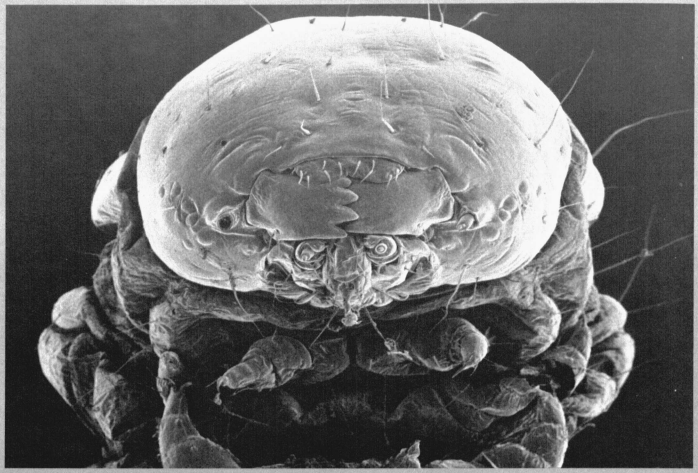
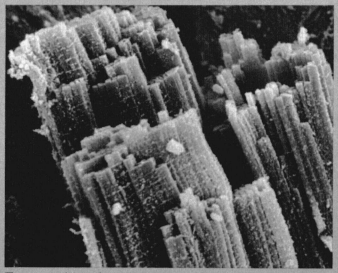
Through the Looking Glass



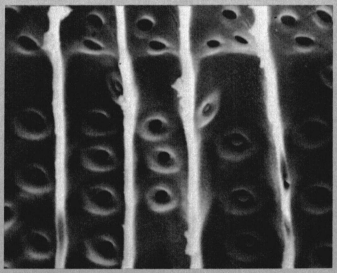
Tick's foot, magnified 558 times.



Corn root worm, magnified 42 times.



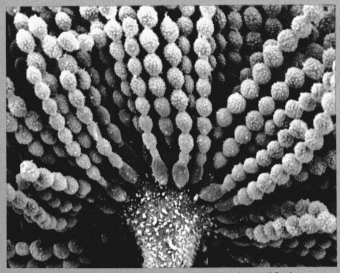
Fractured beef muscle, magnified 1,950 times.



Eastern red cedar fibers, magnified 1,000 times.

"With the scanning electron microscope's high resolution and high magnification, you can see things you don't normally see, not even with a conventional microscope," says Dr. Merton Brown, professor of plant pathology and manager of the facility.

Merton Brown, left, taught Rick Mueller how to use the scanning electron microscope. Now the animal science graduate student spends more than five hours a week photographing bacteria.



Aspergillus flavus fungus, magnified 1,150 times.

TUCKED AWAY in the southeast corner of the Agriculture Building's basement, the facility has served the University since 1968. Each year, about 50 graduate students, technicians and faculty from 20 departments use the $80,000 device.

While a scanning electron microscope is not a rarity at universities, the interdepartmental use of such equipment at Mizzou is one-of-a-kind, an achievement of which the staff is proud. "We're nationally recognized for our ultrastructure. Over the years we have developed an outstanding laboratory for instruction and research. As I see it, we have no peer," says Dr. Robert Goodman, professor of plant pathology and the person instrumental in establishing the facility at Mizzou.

Because electrons are bounced off the surface of the specimen rather than passed through a minute slice, the scanning electron microscope produces an image that has perspective and form.

"Certain types of plant materials, such as wood, seeds and other inherently rigid structures require little preparation; however, chemical fixation preserves the structural features of softer tissues. Samples have to be absolutely dry when they are placed in the microscope to avoid distortions under the high vacuum conditions," Brown says.

"Biological and physical substances are perceived in three dimensions, making subunit composition apparent," Goodman says. "After you've seen a bacteria using the scanning electron microscope, it's not just a word, but a picture."

"THE IMPRESSION is long lasting," Brown agrees.

These images are produced and photographed on a cathode ray tube. "It's like a sophisticated TV camera with a zoom lens," Brown says. At the top of the apparatus, a 5,000 to 40,000 volt electron gun shoots a beam through focusing electromagnetic lenses onto the sample in a vacuum.

Here, then, is a brief excursion to the Lilliputian frontiers explored each day by Mizzou's scientific swashbucklers. — *Larry Boehm*