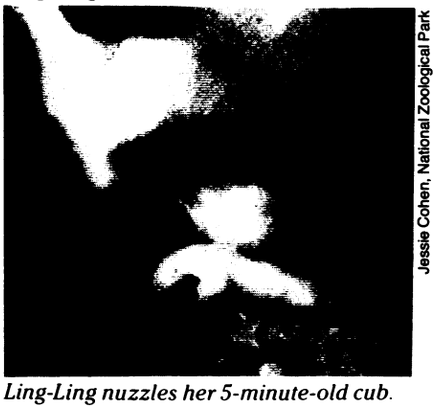
Panda Troubles: Zoo Newborn Dies; Chinese Bamboo Blooms

Each year the National Zoological Park in Washington, D.C. gets a little closer to raising a panda cub. This season was a heartbreaker: A 4-ounce male was born at 3:18 a.m. on July 21, but it died after only three hours. Tests revealed a bacterial infection apparently acquired by the cub a day or two before birth.

"Even though we lost the cub, we now know that Ling-Ling is capable of conceiving and giving a normal live birth," says Christen Wemmer, acting director of the zoo. "Loss of first-born animals is not uncommon."

The only pair of pandas in the United States mated for the first time last March, after seven years of unsuccessful encounters (SN: 3/26/83, p. 199). The female, Ling-Ling, had also been artificially inseminated previously with sperm from the male panda at the London Zoo. The first sign of pregnancy in the 250-pound panda was an increase in hormone levels in Ling-Ling's urine earlier this month.



Jessie Cohen, National Zoological Park

Ling-Ling nuzzles her 5-minute-old cub.

The dramatic birth was filmed with monitoring equipment supplied by the National Geographic Society. The film shows Ling-Ling's abdomen contracting, then the cub suddenly shooting out and dropping to the floor. The infant didn't move until Ling-Ling, apparently inadvertently, touched it with her paw. Then it began squealing and squirming. Ling-Ling picked up the cub in her mouth then cradled the newborn in her arms. She continued to carry and lick the cub throughout the day. "She was doing everything right," says Bess Frank, collection manager for the panda house.

The cub stopped moving about 6:30 a.m., but zookeepers were unable to recover it until late afternoon. A gross autopsy revealed fluid retention throughout the body, with excessive fluid in the chest leading to respiratory failure. Later analysis of tissue samples by microscopy revealed *Pseudomonas* bacteria.

"The baby panda had a prenatal bronchopneumonia. We suspect it was infected at least 24 hours before it was born," zoo pathologist Richard Montali told SCIENCE NEWS. Because the mother appears healthy, he suspects the cub was infected through the vaginal tract. Now they plan to look for the bacteria in specimens from Ling-Ling. They also will examine cells from the cub in hopes of determining which panda was the father.

While zoo breeding of pandas is still an uncertain venture, pandas living in the wild in China may be facing a population decline. In two areas, field researchers are worried there will be panda starvation this winter due to a shortage of arrow bamboo, the animal's principal food.

Arrow bamboo produces flowers approximately every 80 years, then it is dormant for several years before recovering. In the distant past when bamboo flowering occurred, pandas migrated to nearby areas where there was sufficient food. But now human developments have eliminated alternate panda habitats. In the 1970s, 138 giant pandas starved to death in an area where flowering occurred.

More than 90 percent of the arrow bamboo has burst into flower in the area under study at the Wolong Nature Reserve in Sichuan, reports George Schaller, a co-leader of field research at the joint World Wildlife Fund-China panda project in Wolong. The preserve is the largest of China's 11 protected habitats for pandas. It contains about 200 of the 1,000 pandas currently living in China. Bamboo is also flowering in nearby Baoxing County, which is inhabited by about 100 pandas, the World Wildlife Fund reports.

Schaller says the bamboo situation could become serious this winter and develop into "a real emergency" next year. He proposes that plans be made to trap some pandas for release in other areas and for providing supplementary food for the animals that remain. To monitor the crisis, he suggests monthly sampling of panda droppings and of the flowering bamboo to determine how much nutrition the animals are receiving. He says, "If absolutely essential, some pandas might be taken into captivity...and released back into the wild once the bamboo has regenerated."

—J.A. Miller

'Wy-oo-lee' rubber doubler discovered

A silver-leafed desert shrub native to Texas was a celebrated source of natural rubber during World War II, when the United States was cut off from its *Hevea* rubber tree supply in Southeast Asia. Shortly after the war, *Hevea* again became available, but the synthetic rubber industry rapidly developed; rubber from the desert shrub, called guayule (pronounced "wy-oo-lee"), seemed obsolete.

Now, however, guayule may be bouncing back. In greenhouse experiments, scientists have discovered a chemical that, when sprayed on the plant, doubles its rubber production. The research — led by Henry Yokoyama of the U.S. Department of Agriculture in Pasadena, Calif. and Chauncey Benedict of Texas A&M University in College Station — ultimately could lead to less reliance on the imported natural rubber that is in short supply from time to time. Guayule eventually could also compete with the usually oil-based synthetic rubber, which — because it differs chemically from its natural counterpart — cannot be used in certain applications.

But the implications of the chemical rubber doubler, called DCPTA, extend far beyond the guayule fields. DCPTA is not a plant growth hormone; it does not work by merely increasing the size of the plant, Benedict says. Rather, it zeroes in on the plant's rubber-making chemical reactions, and increases the concentration of several enzymes crucial in that process. The discovery of DCPTA could lead to the development of an entire spectrum of "bioregulators" that similarly zero in on valuable chemical reactions of other crops, Benedict says.

In a report to be published in PLANT PHYSIOLOGY, Benedict and colleagues state that 120 days after spraying DCPTA, control (unsprayed) guayule plants contained 2.83 percent rubber, while the treated plants contained 5.23 percent rubber. (Without the help of DCPTA, each guayule plant produces an estimated 3 ounces of rubber [SN: 6/6/81, p. 365].)

The researchers also found that DCPTA, or dichlorophenoxy-triethylamine, seems to extend guayule's rubber-producing season — which is usually during only the fall and winter months when the plant is exposed to low night temperatures. DCPTA therefore could make it possible to commercially grow guayule in California, New Mexico or Arizona — "where conditions are optimal for good vegetative growth but the night temperatures are not low enough to induce rubber production," Benedict says.

First, however, further work on guayule — to determine, for example, the effect of DCPTA outside of the greenhouse — must be conducted. Earlier this year, the Firestone Tire and Rubber Co. agreed to allow Texas A&M scientists to conduct guayule research at that company's facility in Fort Stockton, Tex.

— L. Garmon