More cloning news closed out 1998

The efficient cloning of a cow in Japan and a deliberately aborted cloning of a woman in South Korea have continued to fan the furor over this new reproductive strategy.

Although several research groups had already created clones of adult mammals—sheep, cows, and mice—the success rates haven't been much to brag about. Few of the embryos generated actually survive and develop into healthy adults.

In the Dec. 11, 1998 SCIENCE, however, Yukio Tsunoda of Kinki University in Nara, Japan, and his colleagues report the birth of eight calves through the cloning of cells from an adult cow. These calves were the result of just 10 implanted embryos, a remarkable success rate that gives researchers hope that cloning can be an efficient way to generate animals with desired traits. For example, Tsunoda's group and several others in his country are looking to create clones of cows that are especially valued in Japan for the taste of their meat. Four of Tsunoda's eight calves died soon after birth, although it's unclear whether the deaths were due to the cloning or unrelated problems.

Such uncertainty about the health of cloned animals is one reason why many scientists reject the idea that human cloning will occur soon. Last month, however, researchers at the Kyunghee University Hospital in South Korea announced a small step toward that goal. They had taken the DNA-containing nucleus from a cell of an infertile woman and transplanted it into one of her eggs, which had previously been surgically harvested and had its own DNA removed. The egg divided twice before the researchers destroyed it, in accord with South Korea's laws on experimenting on human embryos.

The experiment was disclosed at a press conference, not in a peer-reviewed journal. Some cloning researchers argue that the work does not offer any information on the feasibility of human cloning. Although the woman's egg started dividing, a developing embryo doesn't actually use its DNA until the fourth or fifth round of cell division. The South Korean experiment, therefore, ended before researchers could evaluate whether the DNA transfer was a success, critics say. —*J.T.*

Mutant flies can't get no satisfaction

The genetics of human sexual behavior is a minefield, as the ongoing debate over the existence of a gay gene aptly shows. The sexual habits of insects, and the genes that drive them, are a bit less prone to provoke newspaper editorials. Still, scientists have identified gene mutations that turn a male fruit fly's fancy to others of his sex and that disrupt his courtship ritual (SN: 12/4/96, p. 373). They've now found a gene involved in both male and female sexual behavior.

The gene is named *dissatisfaction* because female flies with mutations in it vigorously dismiss male advances. If fertilized despite their resistance, these females fail to lay eggs because they can't control their uterine muscles. As for males with the mutant gene, they mistakenly try to mate with males as well as females and also have neuromuscular defects that make it difficult for them to copulate.

In the December 1998 NEURON, Michael McKeown of the Salk Institute for Biological Studies in San Diego and his colleagues identify *dissatisfaction* as a gene encoding a protein that regulates other genes. The gene is active in as few as 25 to 50 brain cells. The researchers believe that *dissatisfaction* is part of a set of genes regulating sexual behavior independently of the two genes already known to influence male fruit fly courtship, *fruitless* and *doublesex*.

"We're in the process of looking for *dissatisfaction*-like genes in vertebrates," notes McKeown. The researcher argues that although people are obviously much more complex than flies, the notion that genes influence human sexual behavior has to be taken seriously. —*J.T.*

Close call takes toll on rare clover

A California clover has provided a tidy case study of the genetic havoc caused by a brush with extinction.


Knapp

Showy Indian clover nearly became extinct.

Showy Indian clover, *Trifolium amoenum*, once dotted grasslands north of San Francisco Bay. However, the clover population shriveled, and botanists searching in the 1970s failed to find any specimens. In 1984, the California Native Plant Society listed the species as "presumed extinct."

Then in 1993, a single clover plant turned up beside a dirt road near Occidental, Calif. Fortunately, the plant pollinated itself, and Eric E. Knapp of the University of California, Davis and Peter G. Connors of the university's Bodega Marine Laboratory coaxed sprouts from 18 of 92 seeds collected. From this precarious start, the researchers have built up a seed supply.

In 1996, they stumbled onto one more remnant, about 225 plants near Dillon Beach in Marin County, Calif. Analysis of this patch and of two closely related clover species allowed researchers to assess what genetic variation got lost when their inland clover population went through a so-called genetic bottleneck, pinched back to just one plant.

The offspring of that single plant had "surprisingly high" variation considering its circumstances, they report in the January AMERICAN JOURNAL OF BOTANY. In the 20 plant enzymes they checked, three still showed signs of genetic variation. Yet this represented a 53 percent reduction in variability compared with the beach plants and the related species.

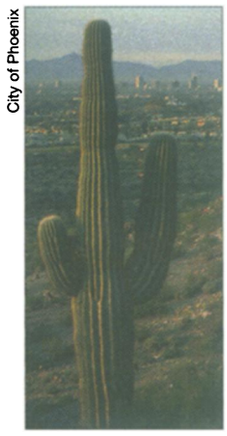
Interbreeding beach and inland clovers would mean tradeoffs, Knapp says. Mixing populations might add helpful variety to inland plants but dilute genes adapted for local conditions. The inland clover stands more upright, while the plants on the windy coastal bluffs hug the ground. —*S.M.*

One era's cactus boom is another's bust

The way-too-short life of a human biologist doesn't allow much perspective on the saguaro cactus. The stately giants routinely live 125 to 175 years, and some for almost 300 years.

Combining data from three generations of botanists studying a single population of plants, however, has shown that what one scientist sees as a dramatic population boom or a bust may just be a small part of a long-term cycle.

The current generation of scientists, Elizabeth A. Pierson and Raymond M. Turner of the U.S. Geological Survey and the University of Arizona in Tucson, went back to records of saguaro surveys on Tucson's Tumamoc Hill beginning in 1908. The long stretch of data allowed them to verify their method of estimating growth rates and ages, the researchers report in the December 1998 ECOLOGY.


City of Phoenix

A saguaro cactus can live almost 300 years.

Taking the long perspective also allowed them to see slow changes in cactus numbers. They concluded that the hill's population probably went into a decline around the late 1870s but began to recover in the 1920s. That surge in population peaked about 1970, then numbers began to dwindle again. A scientist inferring the health of a saguaro population just from data during his or her lifetime would have been misled, they say. —*S.M.*