RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Meteorite Dealers Under Arrest in Rio

A well-known meteorite dealer is being detained in a federal prison in Rio de Janeiro for allegedly stealing valuable meteorites from Brazil's National Museum.

Ronald Farrell, 43, head of Bethany Sciences in Bethany, Connecticut, is a familiar figure to many museum curators and meteoriticists. The extraterrestrial chunks he specializes in have been a hot commodity ever since the mid-1980s, when data from Viking probes showed that some were from Mars.

In June, Farrell and colleague Frederick Marcelli arrived in Rio to do some meteorite trading at the National Museum and a museum run by the National Department of Mineral Production. Astronomer Elisabeth Zucolotto, curator of the National Museum's meteorite collection, says that on 20 June she drove the dealers to the airport. According to Zucolotto, when she returned to the museum, she discovered that ordinary rocks had been substituted for three meteorite pieces. She called the police, she says, and rushed back to the airport, where the missing rocks were allegedly found in a small box hidden in a shoe in Farrell's luggage. The pair was arrested and charged with theft.

MUSEU NACIONAL, RIO DE JANEIRO

Rock on the spot. Angra dos Reis.

One of the specimens is "considered a Brazilian national treasure," says Smithsonian Institution meteoriticist Roy Clarke. Called the Angra dos Reis after where it was found in Brazil in 1869, the 4.6-billion-year-old, 67-gram rock is unique in that it is made up almost purely of augite, a black, volcanic mineral.

Farrell says he was framed. His lawyer, Deborah Srour of Barry Fischer and Associates in New York City, says Zucolotto could have planted the rocks in the luggage. Zucolotto says that would have been impossible.

At the end of July a judge held a hearing to listen to the accusers' case. Lawyer Fischer says the defendants are currently presenting evidence to the judge in hopes of getting released prior to the trial, which has not yet been scheduled.

Calf Cloned From Bovine Cell Line

In the beginning there was Dolly, the first mammal cloned from an adult cell; then Polly, a lamb cloned from genetically altered fetal skin cells. Now there's Gene, a male Holstein calf. ABS Global, an animal breeding company in DeForest, Wisconsin, last week unveiled 6-month-old Gene, who was produced much the same way a Scottish team made the sheep clones (*Science*, 7 March, p. 1415).

Although not the first bovine clones, Gene and several others bred by the company are the first to come from cells that had been growing and replicating for a long time in laboratory dishes. Those types of cells "are an unlimited genetic resource," says Michael Bishop, a molecular geneticist with ABS Global, because they can be frozen and used to produce large numbers of animals.

To create Gene, embryologists first removed the nucleus, with its genetic material, from a cow's unfertilized egg, then fused the egg with a lab-grown cell. Unlike with Dolly, after the egg began dividing, a cell was removed and fused with another enucleated egg. That cell's DNA guided the egg's development in a lab dish for 7 days. The resulting embryo was then placed in a female to gestate. In Dolly's case, the cell came from a cell line derived from the udder of an adult sheep; for Gene, the cell had its origins in a 30-day-old fetus.

According to Bishop, ABS Global and its new spin-off company, called Infigen, have developed a procedure that enables them to turn any cow cell into a permanent line capable of providing DNA for clones. Several calves cloned from adult cells are on the way. He foresees a wealth of applications—including designing cows with more nutritious milk. For the biotechnology industry, this achievement "is even more important," says embryologist Carol Keefer of Nexia Biotechnologies in Montreal, who envisions herds of transgenic cows producing large quantities of therapeutic proteins in their milk.

It's a "big breakthrough" to do cloning from cells other than embryonic cells in an additional species, comments Mark Westhusian, an embryologist from Texas A&M University in College Station. "It suggests that we can do it in any species."

ABS GLOBAL

Moo. Cloned Gene makes debut.

Supernova Fireworks Coming Up

Supernova 1987A—a massive stellar blast 167,000 light-years away—announced itself 10 years ago with a brilliant flash. Now astronomers may be seeing the beginnings of another display: debris from the blast colliding with rings of gas that exist half a light-year from the explosion's center.

So far, the fastest moving debris has been invisible, but its collision with the slowly expanding gas rings—puffed off by the supernova's parent star long before it exploded—is expected to light up the debris, enabling scientists to determine its composition, speed, and direction. The collision also should be dazzling, says Peter Garnavich of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. "We're expecting it to get really spectacular."

Last month, Garnavich and colleagues Robert Kirshner and Peter Challis noticed, in images from the Hubble Space Telescope, a brightening inside the inner ring. That matches an earlier signal indicating that a blob of gas inside the ring is moving toward Earth at 250 kilometers per second, more than 10 times faster than the gas in the ring. Taken together, the evidence suggests that the fastest moving debris may have reached the ring. Scientists hope to confirm this with a detailed ultraviolet spectrum analysis in the near future.

Men Have More Gray Cells

Men have proportionally bigger brains than women, even when their larger bodies are taken into account. But they aren't generally thought to be any smarter. What's going on? Some researchers have speculated that the two sexes still have the same number of neurons in their cortices—the brain's outer layer of gray cells which is associated with complex behaviors—but that women's are more tightly packed. But according to the latest study, men really do have more gray matter.

In a paper published in the 28 July *Journal of Comparative*

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Neurology, Danish neuroscientists Bente Pakkenberg of the Bartholin Instituttet in Copenhagen and Hans Jørgen Gundersen of Aarhus University describe how they used the latest stereological techniques—counting cells from different angles to produce unbiased measurements—to estimate the number of cells in the cortices of 94 deceased Danes.

The researchers confirmed that men do have proportionally bigger brains overall. They also found that males had about 16% more cortical brain cells, or an average of 23 billion versus 19 billion for women. No sex differences were found in neuronal density.

The 16% difference is "surprisingly large," and there are no known sex differences in complex behaviors that could account for it, write the authors. Although some researchers, such as C. Davison Ankney of the University of Western Ontario in London, Ontario, have speculated that males' extra cortical neurons are located in brain regions responsible for spatial reasoning, in which males typically perform better than females, the authors found that the additional neurons were evenly distributed over different cortical regions.

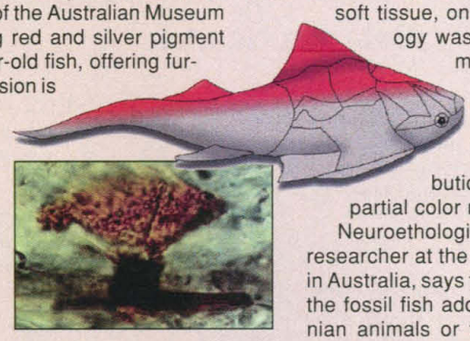
While people have puzzled over whether the sex difference in brain size means females have higher neuronal density, "this paper says it's really just numbers of neurons," says Harvard University neuroscientist Albert Galaburda, who adds, "What does it mean to have more neurons? It means nothing. What's important is the architecture of the circuitry."

Coloring Fossils

What colors were dinosaurs and other animals known only from their skeletons? Answers to that puzzle have generally been left to artists or movie producers. But in a paper to be published in the *Proceedings of the Royal Society* in London, biophysicist Andrew Parker of the Australian Museum in Sydney reports finding red and silver pigment cells in a 370-million-year-old fish, offering further evidence that color vision is a very old evolutionary adaptation.

Until now, the oldest known animal pigment cells were from a 50-million-year-old frog found in Mesel, Germany. Parker says his recent find was "an accident" stemming from his study of a species of myodocopid seed shrimps that waggle iridescent hairs in their mating display. These "living fossils" hail from the Devonian era, more than 350 million years ago, so it occurred to Parker that Devonian fossils might yield similar light-producing structures.

The 370-million-year-old specimen of an armored fish, or placoderm, found in the Antarctic, seemed a good place to look. When Parker sliced transparently thin sections of fragments of the fish, not only did he find silver iridescence-producing cells similar to those in shrimp on the fish's belly, but also red pigment cells, which might have been incorporated into the bone from the soft tissue, on its back. "Their morphology was so obviously that of pigment cells [which have branching arms] that they couldn't be anything else," says Parker. By mapping the cells' distribution, he has come up with a partial color model of the ancient fish.



A. PARKER

Fill in the blanks. Red pigment cell (photo) and body color scheme of ancient Antarctic fish *Groenlandaspis*.

Neuroethologist Jack Pettigrew, a vision researcher at the University of Queensland in Australia, says the finding of color cells on the fossil fish adds to evidence that Devonian animals or their predators had color vision. Parker says knowing more about the color of prehistoric creatures will help scientists learn more about their lives. For example, the reddish color of this fish suggests it lived in a reddish-brown environment—consistent with the freshwater habitat it was believed to occupy.

Parker adds that until now, scientists haven't devoted much attention to looking for pigment cells in fossils. But, he says, "if we know that color cells can be preserved for this period of time, there is no reason we shouldn't find them in dinosaurs."

Undoing Bacterial Resistance

The rise of bacteria that are resistant to antibiotics has left researchers scrambling to develop more powerful drugs. But in the 5 August *Proceedings of the National Academy of Sciences*, scientists at Yale University report their first success with a different strategy: tricking the upstart bacteria into scrapping their defenses.

Working with a strain of *Escherichia coli* bacterium, molecular biologist Sidney Altman and colleagues harnessed one of the bug's own enzymes, RNase P, for the job. First, they figured out the RNA sequence that this enzyme cuts. Then, they set about fooling the enzyme into disabling the genes that are linked to drug resistance. They did this by creating a short piece of DNA, called an external guide sequence (EGS), whose RNA links up with the RNA template the bacterium uses to make proteins that confer drug resistance. Combined, the two pieces of RNA look like RNase P's normal target, causing the enzyme to grab on and slice the template in two. The EGS emerges unscathed from this process and moves on to bind to other copies of the template. Altman and his colleagues created EGSs specific to two antibiotics, chloramphenicol and ampicillin, and effectively resensitized a resistant *E. coli* strain to both drugs.

If EGSs can be adapted to reverse drug resistance in human bacterial and viral infections, Altman says this might give new life to many older, now relatively ineffective antibiotics. But researchers still have to find a safe and easy way to insert EGSs into human cells, a feat that could take several years of work. Even if they succeed, points out Mitchell Cohen, a microbiologist at the Centers for Disease Control and Prevention in Atlanta, the strategy is not invulnerable. "This method doesn't get around" the fact that bacteria could eventually develop resistance to an EGS, he says.

S&E Immigration on the Rise

Immigration of scientists and engineers to the United States, which peaked in 1993, is climbing again, according to the latest figures from the National Science Foundation (NSF). During the 1980s, about 12,000 arrived each year, but the ranks swelled dramatically in 1993 owing to changes in immigration law and a new law allowing Chinese students to stay in the United States after the Tienanmen Square killings. Nonetheless, says NSF analyst Mark Regets, graduate enrollments of foreigners in science and engineering continues to decline—from 93,085 in 1992 to 83,274 in 1995.