

Biology

Frozen rabbit embryos: That's no bull

The successful implantation of one frozen cow embryo (SN: 6/30/73, p. 419) spurred great hopes for a "brown revolution" until the experiment proved to be irreproducible. Only the embryos of mice had been successfully—and reproducibly—frozen and implanted. Until now.

Harvey Bank of the Medical University of South Carolina and R. R. Maurer of the National Institute of Environmental Health Sciences now report the successful freezing and birth of rabbit embryos. In the January *EXPERIMENTAL CELL RESEARCH*, they report freezing embryos at minus 196 degrees C. from 30 minutes to two weeks. When thawed and grown in culture, more than half continued to divide and grown for several hours. When implanted, some developed into viable fetuses and normal offspring.

Basic cryobiological information from this system may lead to the successful freezing, storage and transportation of more complex systems, they state. Procedures similar to theirs may be successful for freezing livestock embryos, and this, they say, "may have an impact on food production comparable to the 'Green Revolution' impact" of grains.

Albino gorilla a father again

Snowflake, the only albino gorilla known to scientists, has fathered his third black offspring. But biologists at the Barcelona Zoo aren't surprised. They'd predicted only a 50 to 1 chance of Snowflake's offspring being white. The 265-pound albino has given up his favorite doll, and now appears more interested in tearing at automobile tires, but for several years his favorite plaything was a blue-eyed, white-furred reproduction of himself. The first time the young ape saw the doll, he grabbed it, hugged it and gently carried it about. Although dominated by his cagemate, a male named Muni, he valued the doll so highly that he vigorously defended it against Muni. Snowflake, a lowland gorilla, was found in 1966 clinging to the body of his mother, a black ape shot by a banana farmer on the west coast of Africa.



Genetic super trees taking root

Scientists bent on germinating super forests are planting seeds these days specially selected for their superior growth hormones. Dropped in styrofoam cups of granite chips (to prevent fungi and rot), the seeds sprout in a matter of days, and within 40 years each fir can be harvested for enough wood to make half a house. Planted in greenhouses, the seedlings are gradually exposed to climatic extremes to toughen them for their lives in the woods, then are planted by a special gun that digs a hole, drops in the treelet and tamps down the dirt. Some of the best of the crop are expected to grow 20 inches tall in one year, four times the rate of natural trees. The only worry is that the super trees may prove vulnerable to disease and parasite.

At Mosby Creek, Ore., Philip Hahn, a research forester for the Georgia-Pacific Corp., grafts the cone-producing tops of 50-year-old, well-formed Douglas firs onto vibrant bottoms of two-year-old trees.

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Technology

Another new Japanese engine

Japanese automakers have scored another achievement in designing a new kind of engine that cuts back on exhaust emissions without the need for afterburners or catalytic converters. The latest design comes from Fuji Heavy Industries, Ltd., maker of Subaru, and is described in Jan. 20 *CHEMICAL AND ENGINEERING NEWS*.

The aluminum-alloy Subaru engine has horizontally opposed cylinders and cuts carbon monoxide and hydrocarbon emissions by slow burning of a very lean fuel mixture. To achieve this, the initial lean fuel-air mixture is preheated and, just as the combustion stroke begins, even more air is injected to promote complete burning. Nitrogen oxides are reduced by lowering the combustion temperature through modifications in timing, compression ratio and cam design.

In initial trials in a four-cylinder, 1,700-pound test car, emissions of all three pollutants were well below Japan's 1975 standards. These correspond closely to original U.S. 1975 standards.

Nuclear ships not feasible

A report by the National Academy of Sciences says that atomic-powered commercial vessels are not yet economically competitive with conventional ships, despite recent increases in oil prices; but this conclusion is based on the assumption that fuel oil cannot indefinitely continue at today's prices.

The study was conducted by a panel of the academy's Maritime Transportation Research Board, which makes three recommendations for future action: that the Government be alert to opportunities for special-purpose nuclear-propulsion vessels, such as icebreakers; a technology incentive program be established between Government and industry to share financial risks involved, and further research in the matter be pursued, including estimates of possible environmental impact of nuclear ships.

Stopping bridge deterioration

The Department of Transportation has announced plans to try a novel method to stop deterioration of the nation's bridges, some of which have auto decks that are cracking up at an "alarming rate." The problem stems from the use of de-icing chemicals that penetrate concrete superstructures and corrode the interior reinforcing steel bars. The corrosion products, in turn, cause the concrete to crack.

Like all metallic corrosion, this process involves a flow of ions with the corroding iron acting as the anode, releasing ions. Engineers hope to stop corrosion by reversing the current flow, applying external direct current in sufficient amounts to overcome the one involved in corrosion. Called "cathode protection" (the interior steel is thus changed to a cathode), this method has already proven useful against corrosion in buried pipes and submerged piers.

Integrating a supercool generator

A superconducting, three-megawatt generator at MIT has been integrated into the Cambridge power system, a first for such devices. After the successful test, engineers said they hoped superconducting generators could be produced commercially within a decade, delivering six times more power per unit size than convention generators, at lower cost with greater stability. Theoretically, superconducting generators should also be able to create higher voltages.

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