

## U.S.-Japan whaling accord ruled illegal

In a complicated bartering agreement drafted late last year, the U.S. Commerce Department promised to waive the threat of economic sanctions against Japan — specifically, involving the right to fish in U.S. territorial waters — if Japan's fishing fleet would promise to end sperm whale hunting by 1988 (SN: 12/1/84, p. 343). As a further inducement, Commerce offered to allow Japan 400 sperm whales a year through this year, 200 a year for the next two years, and other whale species at limits to be specified later by the United States. But in a landmark ruling handed down earlier this month, U.S. District Court Judge Charles R. Richey rejected the compromise pact.

There is but one issue in this case, Richey says: whether Commerce Secretary Malcolm Baldrige has discretionary authority to determine what actions will trigger an automatic sanction. And he does not, Richey writes in his 28-page opinion: "Once the Secretary has determined that a nation is acting so as to diminish the effectiveness of the International Whaling Convention [IWC], he must certify that fact to the President." Under the Packwood-Magnuson amendment to a fisheries law, the President must then revoke the violator's U.S. fishing rights.

Though Commerce had claimed its pact would preserve the effectiveness of the IWC by ultimately bringing Japan into compliance with the ban, Richey rejected that argument. "Packwood-Magnuson was enacted to put teeth into the certification process by eliminating the discretion given the Executive [branch of government] whether to apply sanctions," he explained. Moreover, he said, after Commerce's past record of interpreting the taking of 15 or 20 endangered bowhead whales as endangering the entire IWC structure, it was inconceivable to him how the agency justified offering Japan 1,200 sperm whales and unknown numbers of minke and Bryde's whales with impunity. As a result, Richey ordered Commerce to certify Japan's failure to heed the IWC quota and prohibited Secretary of State George Schultz from withholding sanctions. Last week the Commerce Department filed for a stay of that order pending its appeal of Richey's decision.

## Major victory for Bendectin's makers

A growing number of lawsuits over its anti-nausea drug Bendectin—used in more than 33 million pregnancies—caused the Cincinnati-based Merrell Dow Pharmaceuticals in 1983 to cease production of the drug (SN: 6/18/83, p. 389). Last week, most of those lawsuits were dismissed when a six-person jury decided that the drug was not responsible for causing birth defects in children born to women who had used the drug to combat "morning sickness" during pregnancy. Of the 1,500 to 1,600 Bendectin lawsuits that had been outstanding this year, roughly 1,100 joined in this "common issues" suit to determine the drug's culpability. The plaintiffs, which must share any verdict, are expected to appeal. Merrell Dow was also victorious in the two individual cases that have come to trial thus far.

## News updates

- The Environmental Protection Agency announced that it will phase in a 90 percent reduction in the amount of lead allowed as an octane boosting additive in gasoline (SN: 8/4/84, p. 71), beginning July 1. The interim standard of 0.5 gram per gallon replaces the 1.1 g/gal now permitted. The final standard of 0.1 g/gal goes into effect Jan. 1, 1986.

- A U.S. Court of Appeals has upheld a lower court decision striking down a state plan to allow sport hunting of Minnesota's eastern timber wolf, classified as a "threatened" species (SN: 1/12/85, p. 23). While not finding that sport hunting per se was illegal, it said the state did not prove its wolf population was large enough to withstand culling.

MARCH 23, 1985

## Touch and go for robots

A seemingly simple job like selecting the right screw is too much for today's typical industrial robot. Even after recognizing and picking up the screw, the robot can't be sure of where it's holding the object, which way the object faces and whether the object is slipping. Robots that "see" often can't cope with such fine details or turn out to be very complex and expensive.

Researchers are beginning to realize that instilling a sense of touch may be a cheaper way of getting a blind robot to recognize and handle an object properly. This has prompted interest in developing "hands" with a subtle touch and sophisticated means of making sense of the data gathered by sensors.

At Carnegie-Mellon University in Pittsburgh, Melvin W. Siegel and Gregory M. Toto have developed a tactile sensor using a specially treated polyvinylidene film. When this polymer film is compressed, it generates an electrical signal, but only while the pressure is changing. To compensate for this limitation, the researchers focused on electronic and computational methods for capturing the transient signal and for assembling and understanding tactile images. Their prototype device, which is small enough for a human hand to grasp comfortably, consists of 16 separate sensor pads. Each sensor has its own microprocessor, which relays signals by way of a "supervising" microprocessor to a host computer for analysis. Future plans call for producing the polymer film in the form of a "skin" with a large number of pressure-sensitive dots.

Such "artificial skins" have already been the subject of considerable research. Scientists at the Massachusetts Institute of Technology have designed a flexible rubber sensor that fits on the tip of a finger and actually has a skinlike texture. This touch sensor has three layers. The base is a printed circuit board etched with parallel lines that conduct electricity. The top layer is a sheet of silicone rubber that has been treated to conduct current and is oriented so that its lines are at right angles to those on the circuit board. A nylon mesh or a fine film of sprayed lacquer separates these two layers. The conducting layers meet only when pressure is applied, and each intersection where contact is made sends a signal to a computer. But rubber tends to deform with repeated use, and more work is needed on transforming these signals into one global picture of an object.

A simpler answer may be to let robots "read" objects in the same way that blind people read Braille. Gale Nevill and Robert Patterson of the University of Florida in Gainesville have invented an inexpensive sensor that mimics the ridges of a human fingerprint. Rubbed across a surface, ridges of silicone rubber create vibrations. A small sensor picks up the vibrations and transmits them to a computer where the pattern of vibrations is analyzed. This sensor can now read Braille, identify grades of sandpaper and tell in which direction the slot in the head of a screw is pointing.

But the day when a robot's steely grip softens enough to handle mundane but delicate tasks like picking up a coffee-filled Styrofoam cup or juggling a raw egg still seems far away.

## Up the round escalator

For more than 80 years, escalators have been going straight up or straight down. Now, in time for the opening of Expo '85 this week in Tsukuba, Japan, a Japanese shopping mall is getting a newly designed escalator that takes a longer, semicircular path to the top. This escalator easily turns a corner.

Engineers at the Mitsubishi Electric Industrial Corp. took almost three years to design the product. So that the drive chains connecting the steps could twist, ball bearings were put between the links. The steps had to be shallower toward the inside of the curve but still comfortable for passengers. Meeting these constraints required hours of computer calculations and numerically controlled tools to fashion each of the steps individually.

187