WHOOPING CRANES

Back from The Brink

Whooping cranes have been moving toward extinction ever since the early Pleistocene age that spawned them a million years ago. When covered wagons were pushing westward across the United States, there were no more than 1,000 of the great white birds in the world. By 1945, only 22 of the rare giants were left to winter at the Aransas Wildlife Refuge in Texas.

Luther Goldman

From a long neck, a mighty whoop.

So, when these 22 survivors headed north that spring for their nesting grounds somewhere in Canada, conservationists embarked on what was to be a 10-year search for the birds' summer homes, which were finally discovered in isolated, rugged territory in Canada's Wood Buffalo Park, east of Alaska.

The discovery, which spurred biologists' hopes of saving the whoopers by learning more about the natural and man-made sources of their demise, came none to soon. While scientists—in 1955—were thinking about long-term projects on the cranes' habitats, the Air Force was thinking about exploding flash bombs close enough to the crane's wintering place in the Aransas Refuge to wipe it out as a sanctuary. Pleas from the Canadian ambassador to the U.S. Department of State, however, lead the Air Force to change its mind.

Since then the world population of whooping cranes has climbed precariously to 55. But for the first time, there is real hope of preserving the species. Scientists have found that eggs taken in the wild can be hatched in captivity. And, because the birds apparently reproduce prolifically if they are born and bred in captivity, scientists think they can cultivate large numbers of whoopers by transporting a few eggs a year from their nests in the Canadian wilderness to civilization.

Six eggs were stolen from their mothers' nests about a month ago by U.S. and Canadian biologists who flew them to the Patuxent Wildlife Research Center in Maryland. Plans call for stealing more eggs from family nests—about six a year—according to Dr. Ray Erickson, project director.

Scientists were alerted to nests' locations by a scouting team who had run a helicopter check of the Wood Buffalo area about two weeks before. The thievery took about 15 minutes per egg as scientists swooped down to the nest, grabbed one of two eggs, and then disappeared as fast as possible to avoid upsetting adult cranes any more than necessary.

Apparently the shy parents, who sometimes require up to 700 lonely acres of wilderness to themselves before they will even build a nest, then returned to the remaining egg which will hatch normally if all goes well.

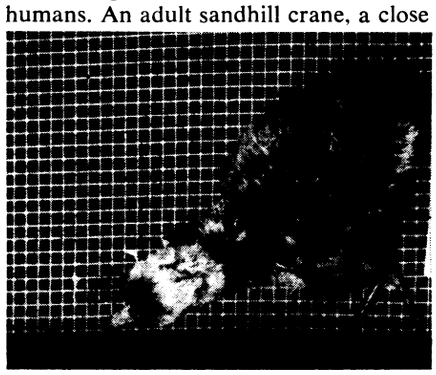
Meanwhile, each stolen egg was carefully slipped into a styrofoam pocket nestled among heaps of hot water bottles in an ordinary suitcase en route to portable electric incubators.

One chick hatched prematurely during the flight between Canada and the Patuxent Center and died, probably from lack of oxygen at high altitudes. The others hatched in carefully controlled incubators in Maryland.

Chances of increasing the cranes' numbers are good because they reproduce in captivity—especially if they are born and bred in captivity. However, one female whooper named Rosie, captured when she was already grown, has taken 10 years to lay an egg. Two weeks ago she laid her first two eggs at the San Antonio Zoo and the chicks ought to be pecking their way through their shells around the Fourth of July.

The five baby cranes at Patuxent will not mature sexually for five years, and their reproductive cycles may not hit full swing until they are 10 or so, but after that it is possible that the females will lay more than 10 eggs a year for most of their 35- to 50-year lives. However, at this point the sex of the chicks is undecipherable and will remain so for a year.

Their upbringing will be carefully controlled. They live in an eight-foot enclosure with a "No Visitors" sign on the door. Inside, translucent partitions separate one chick from the other—they would kill each other otherwise—and cut-out figures of adult whoopers with white feathers and black-tipped wings line the walls. Biologists who enter the enclosure robe themselves in shapeless white gowns to prevent the young from concluding that their mothers are humans. An adult sandhill crane, a close relative, is there to show them, by example, what they're to be like when they grow up, Dr. Erickson says. "We don't know that such precautions are necessary, but we're not taking any chances."



Luther Goldman

Baby whooper—the key to survival.

SOLAR ASTRONOMY

A Rare Flare

The first warning had come the week before with the sighting of an unusually large cluster of sunspots, but the actual alert didn't sound until the sun rose over the southwestern U.S. on the morning of May 23. As the fiery disk appeared on the horizon, a continuous stream of low-frequency radio waves was detected by scientists at the Space Disturbance Forecast Center in Boulder, Colo. For days they had been keeping the sun under the scrutiny of the "White Light Patrol," with a four-inch telescope constantly trained on the solar disk; now they knew something was about to happen.

Patrick McIntosh, an astronomer who spends three-quarters of his time keeping an eye on the sun, went about his morning business as usual, then went home for lunch. On the way back to work, he stopped to glance through a six-inch reflecting telescope that he keeps at home. What he saw sent him hurrying to his post.

The sight had been a rare one—fewer than two dozen like it had been reported in the history of astronomy—but McIntosh knew instantly what it was. Standing out against the sun's image, then fading away as he watched, was a spot of brilliant white light. This

was a white light solar flare, one containing all the colors of the visible spectrum.

Outpourings of protons, electrons and other forms of radiation accompanying the flare were picked up by earth-orbiting satellites such as the Navy's SolRad series, while scientists watching the moon feared—unnecessarily, as it turned out—that the film in Lunar Orbiter 4, which was taking pictures at the time, might become fogged.

Nor was the solar spectacular over. Two days later, the unusual flare was followed by the most intense magnetic storm in more than a decade, which lasted for more than 24 hours.

The flare itself was the real rarity, however. Although it was second in a succession of three close-together flares, the others showed no traces of the white light phenomenon.

A white light flare is actually part of a larger flare, and exists only at the bigger one's peak size, and at the point where it is hottest. The eruption encompassing the May 23 white light flare was rated at "Importance 3," almost the maximum size and duration in a scale that only extends up to 3+. Scientists at the center believe the flare may have produced synchrotron radiation—streams of electrons accelerated to prodigious energies by passing through an intense magnetic field—which is the same kind of radiation produced in the Crab Nebula, a major celestial source of radiation. If this is

Mt. Wilson and Palomar Observatories

The Crab Nebula—like a rare flare.

true, McIntosh says, it is probably safe to conclude that all such white light flares produce this kind of emission. It is also likely that the presence of synchrotron radiation would be closely connected with strong magnetic disturbances.

Unfortunately, it may be difficult to find out if such radiation did indeed come from the recent flare. The usual method would be to measure the polarization of the flare's light as it was in progress, but since the white light was unexpected, no such measurements were set up beforehand. Fortunately, however, there may be other techniques available, since the flare was photographed; it is believed to be the first of its kind ever captured on film. The U.S. Air Force's Sacramento Peak Observatory, located in Sunspot, N. Mex., has its own White Light Patrol, which automatically photographs the solar disk every 30 seconds. Scientists there are attempting to analyze the flare's radiation through the use of photometry.

Astronomy itself is almost as old as the human neck-joint, but flare-watching, says McIntosh, dates only from early September of 1859. The English astronomer Richard Carrington, who was sufficiently accomplished to have had his own observatory for six years previously, was trying to measure the sun's rotation by studying sunspots as they moved across its face. On September 1 or 2, while looking at the dark sunspots, he suddenly came upon a blazing patch of light that was brighter even than the rest of the sun's surface. His curiosity was aroused and a science was born.

RADIO ASTRONOMY

Carbon Broadcasts

Space is occupied by atoms of many elements—from hydrogen on up to the heavier elements. To radio astronomers, however, only the few—helium and hydrogen up to now—which emit energy in the radio frequency range—are of any value. Now there may be a third.

The newly-discovered radiation probably comes from carbon, according to studies by six Harvard College Observatory astronomers and one from the National Radio Astronomy Observatory in Green Bank, W. Va. They reported to last week's American Astronomical Society's sessions in Williams Bay, Wis.

Radio waves from hydrogen sources in the sky have already enabled maps to be made of the Milky Way's spiral structure in greater detail than was possible optically.

The hydroxyl ion, a charged combination of the elements of hydrogen and oxygen, has also been found to emit microwave radiation.

Deuterium, a heavy form of hydrogen, has been sought and reportedly detected by the Russians, but this has not been confirmed.

The emission from carbon was discovered when the astronomers were looking for radio emission at a frequency (5009 megacycles) where they expected to find further evidence of helium, or possibly of hydrogen.

They found five helium sources, but they also detected two other objects sending out radio waves believed unlikely to be from either helium or hydrogen. These objects broadcast at a slightly different frequency (5011.33 megacycles), which was far enough from the expected frequency so that the scientists are fairly sure it was not simply an error in observing helium or hydrogen.

The radio wave observations were made using the National Radio Astronomy Observatory's 140-foot antenna, equipped with a 21-channel spectral-line radiometer which broke the incoming signals down into their different frequencies.

Drs. Patrick Palmer, Benjamin Zuckerman, Hays Penfield and A. Edward Lilley of Harvard, with Dr. Peter G. Mezger of the NRAO, made the observations, reported to the meeting by Dr. Palmer. The theoretical basis for assigning the measured radio wave line to carbon was worked out by Dr. Leo Goldberg, director of Harvard College Observatory, and graduate student Andrea K. Dupree.

AIR POLLUTION

Apathy Clouds the Air

Air pollution has been a fact of life ever since man learned not to sit downwind from a campfire.

It has been a national political issue in the United States, however, only in the last few years, when conservationists and clean-air-minded Senators decided it was time industrial and urban polluters were called to heel.

Momentum began to build in December, when President Johnson called a national clean air conference in Washington, to launch his own clean air package of proposals, and take the play away from the Congress.

Since then, the Senate Public Works Committee has been holding hearings and drafting legislation which, when it is unveiled next month, should incorporate both Presidential and Congressional views and raise the key question sharply: how much power should the Federal Government have to force urban and industrial polluters to spend their share of the estimated $3 billion a year it will cost to clean the air?

The contest may have to be fought, however, in the shadow of less public concern than either the conservationist proponents of legislation or their cost-conscious opponents may realize.