New condor chicks from captive eggs

Playing midwife to a vanishing species, zookeepers in San Diego March 30 used surgical tools to help a 7-ounce, bald-headed bird out of its shell. Thus went the grand entrance of the first California condor to hatch in captivity. And just five days later, a second condor chick, weighing only about 5 ounces, was assisted from its shell. Although smaller and weaker than the first, this chick is also expected to survive.

The chicks are the offspring of two of the four mating California condor couples that remain in the world. There are about 20 California condors in the wild and three, all male, in captivity.

The egg from which the first chick hatched was laid Feb. 2 in a nest in back country north of Los Angeles. On Feb. 23 it was taken by plane to the San Diego Zoo. The parents are expected to lay a second egg this season, which they will be allowed to brood naturally, thus doubling their potential for boosting the condor count. They have already gone through a second courtship and breeding and are expected to lay the second egg soon, says Jeff Jouett of the zoo.

Hope it's a girl! The sex of the newly hatched captive condors, Sisquoc (above) and Tecuya, won't be determined until they are 4 to 6 months old and can withstand a blood test. All three adult captive condors are male.

Meanwhile, the chicks have been named Sisquoc and Tecuya, the Indian names for condor-inhabited spots in California. Because the condors may eventually be released to the wild, Sisquoc is being fed with a puppet modeled after an adult condor, to avoid the chick's forming an unhealthy attachment to its human keepers. Sisquoc eats chopped mice in water and food regurgitated by the zoo's vultures. The smaller Tecuya eats chicken egg yolks and entrails. As adults, California condors weigh about 20 pounds, have a wingspread of 9 feet and eat carcasses of dead animals. Preparations are underway to retrieve a third egg from a third natural nest, Jouett says. —*J.A. Miller*

Puppet modeled after an adult condor is being used to feed the first zoo-hatched chick, Sisquoc. Zookeepers hope to avoid the chick's forming an unhealthy identification with humans.

Arctic haze observed

Scientists aboard flights over the North Pole have found that the pollutant haze that typically occurs in the Arctic during winter and spring is denser and more widespread than expected. The research flights are part of a recently initiated international project designed to identify the origins, concentrations and possible effects of the layers of sooty haze on environment and climate (SN: 1/29/83, p. 69). The airborne scientists began sampling the haze over Barrow, Alaska, where the National Oceanic and Atmospheric Administration operates a research station. They then flew over the Arctic ice pack during a period when haze concentrations over the Arctic were unexpectedly high. During subsequent flights over the North Pole, Greenland and Norway, the scientists also saw "exceedingly thick" layers of haze that, to their surprise, reached as high as 18,000 feet, NOAA reports. The flight program will continue until mid-April. □

Marine life: Effects on CO_2 and climate?

Scientists attempting to understand the complex relationship between atmospheric carbon dioxide (CO_2) and climate have been puzzled by the observed changes in levels of CO_2 over periods as short (in geologic time) as 10,000 years. Michael B. McElroy of Harvard University suggests that the natural level of atmospheric CO_2 is controlled by biological productivity in the oceans and that, at least on 10,000-year time scales, the productivity is limited by the amount of nitrogen in ocean waters.

Studies of air bubbles trapped in cores of ice drilled from polar caps show that concentrations of atmospheric CO_2 have fluctuated greatly during earth history, diminishing during ice ages and rising as the continental ice sheets melt. In the March 24 NATURE, McElroy asserts that the change occurs because the oceans are more biologically productive during ice ages when more nitrogen, an important nutrient, reaches the oceans. When water is trapped in the ice sheets, sea level drops and nitrogen-rich sediments are exposed and carried back to the oceans by rivers that slash across the continents. (During warm periods nitrogen is trapped in coastal sediments and relatively little reaches the deep oceans.) The nitrogen then nourishes marine plants that extract CO_2 from the atmosphere. Because CO_2 is a "greenhouse" gas, insulating the earth and regulating the amount of heat retained by the atmosphere, the decline in CO_2 levels contributes to the global cooling and still more nitrogen reaches the oceans. Eventually, for reasons not well understood, the cycle reverses and the ice sheets begin to recede. As less nitrogen reaches the oceans, productivity declines, and CO_2 again builds up in the atmosphere, enchancing global warming.

If there is anything "novel" in the hypothesis, McElroy says, it is that "the ocean is not a steady state system, even on very short time scales. In fact, it oscillates back and forth between periods when it has excess nitrogen and periods when it has very little."

The oceans hold enough nitrogen to last about 10,000 years. At present, the world's oceans are using nitrogen faster than it is being supplied, adding CO_2 to the atmosphere at a time when levels of the gas also may be increasing due to man-induced burning of fossil fuel. Studies of glacial cycles and associated changes in levels of greenhouse gases are of interest partly because they proffer some clues to the earth's response to changing CO_2 levels.

Last year Wallace Broecker of Lamont Doherty Geological Observatory in Palisades, N.Y., reported that phosphorus, another major nutrient, is the element that *limits* the amount of biological activity in the oceans, and hence the amounts of CO_2 extracted from or added to the atmosphere. While scientists continue to debate specific points, a main implication of hypotheses such as McElroy's and Broecker's emerges: it may be no coincidence that the intervals between ice ages are remarkably similar to the time it takes marine organisms to use up key nutrients. Instead, the timing may indicate close coupling between climate, levels of atmospheric CO_2 and the insistent demands of the world's microorganisms, which, some scientists believe, may regulate their activity on a global scale to maintain the conditions necessary to their survival.

—*C. Simon*