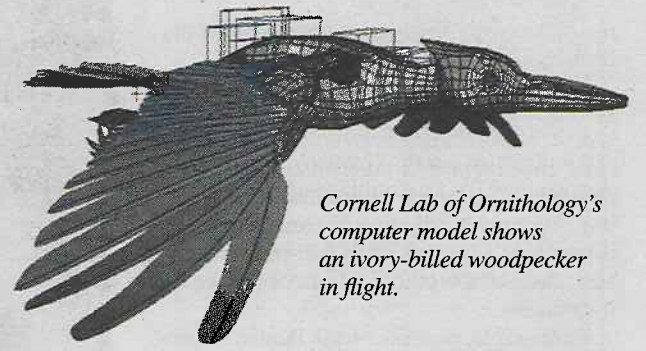
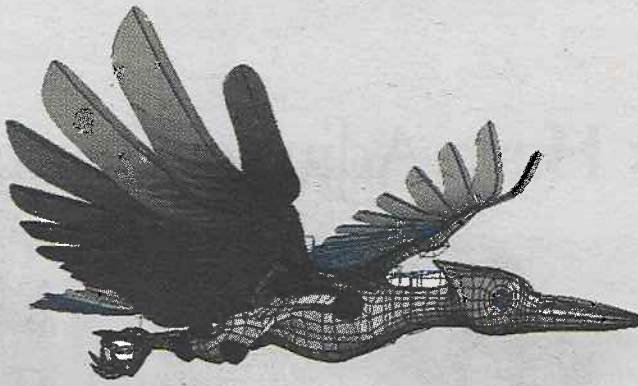
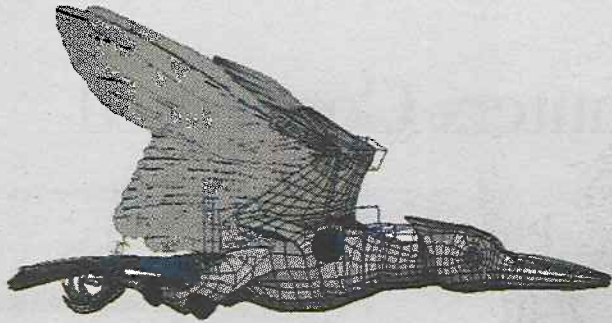


NOTES FROM ACADEME



Cornell Lab of Ornithology's computer model shows an ivory-billed woodpecker in flight.

Extinct, Maybe, but Digitally in Flight

BY ERIK VANCE

THE SCENE OPENS with an Arkansas bayou. The camera skims about 10 feet above a broad, brown river hemmed in by gnarled, leafy mangroves. Suddenly a bird crosses before the camera like a jet fighter breaking formation. After weaving back and forth a few times, it breaks right again and disappears.

In point of fact, it was never there. The short video is part of an unusual experiment using computer graphics to verify the existence of a mysterious animal.

For 60 years, a birdwatcher saying "I saw an ivory-billed woodpecker" was a little like someone saying "I turn into a walrus when I sleep"—the statement was met with patronizing smiles, laughter, or outright derision.

That's because since 1944, the ivory-billed woodpecker has been presumed extinct, thanks to overzealous logging practices. True, every few years, a local hunter or fisherman would claim to have seen a large black bird with "white lightning bolts" on its shoulders, but serious scientists had all but given it up for lost.

Then, in 2004, Tim Gallagher, from the Cornell Lab of Ornithology, was touring a swamp in Arkansas's Big Woods conservation area after yet another amateur sighting of the elusive creature had been reported. Like a scene out of *Jurassic Park*, a large woodpecker flapped out from behind a log and swooped in front of his boat.

"When you see something like that, there's no mistaking it. It's not something you can get wrong," Mr. Gallagher says. When the lab's director, John Fitzpatrick, heard Mr. Gallagher's story, he knew it was just the beginning. "Tim's a guy who's a lifelong birder and a falconer and knows what he's looking at," Mr. Fitzpatrick says. "He was either on drugs, outright lying, or he saw an ivory bill."

Cornell announced the sighting and began to look for other ivory-billed woodpeckers. Bird enthusiasts across the country excitedly mobilized, and newspapers proclaimed that, like Lazarus, the woodpecker had risen from the dead. Not long after, a paddler with a canoe-mounted camera caught a brief image of what seems to be a large ivory-billed woodpecker flying away into the trees.

But four years on, that shaky, blurred footage remains the only concrete evidence of the bird's existence.

Meanwhile Cornell has sent hundreds of volunteers into the forest, made hours of audio recordings, and hidden special cameras there. Skeptics are starting to suggest that the bird on the film is actually a pileated woodpecker, a widespread cousin of the ivory-billed. That is where Donald P. Greenberg,

head of the Cornell computer-graphics program, comes in. The problem with the canoe-mounted footage is that the bird is so blurry, no one can tell whether the flashes of white as it flies are on the front or the back part of the wings.

The distinction is not trivial. If the bird's long wing feathers were white in the back, it was an ivory-billed. If the wings were white only on the front, off the shoulders, the bird was a pileated, and everyone will go home very disappointed.

To try to settle the matter, Cornell staff members and students created a virtual ivory bill. They started with a simple virtual skeleton to give Cornell ornithologists a preview of what the simulators might be able to create. (They even used images from a refrigerated chicken carcass to make the skin more lifelike.) They then incorporated images from the only remaining fully preserved ivory-billed woodpecker body in the world. They (very carefully) took about 400 CAT scans of the preserved body to get the skin and the length of the bones

ference between animating, which he calls "making movements look correct," and simulating, which is based on real physics. While the pelican in *Finding Nemo* or the pigeons in *Valiant* may look right to the layman, experts like Mr. Fitzpatrick literally laugh at the way they fly. Scientists can easily get their hands on computer models of people running, but no one has ever digitally modeled bird flight.

Lacking proper footage of ivory-billed woodpeckers flying, the team used a high-speed digital photography of a pileated woodpecker.

Then they painstakingly fit the digital woodpecker to the movements of the pileated. Now all that was left was to point the bird the same way as the woodpecker in the film and let her rip. After, of course, the scientists simulated the blurry camera and other details. The whole process took more than two years. The Cornell team now says it appears the white wing patches on the computerized woodpecker flashed at the same time as

the patches on the bird in the video. That means there's a good chance that the ivory-billed is really back.

Sort of.

"There's a big difference between the common assumption that we're declaring that ivory bills are still flying around out there," says Mr. Fitzpatrick, "and what we actually did, which was to say 'We got one bird.'"

The ivory-billed woodpecker is no Lazarus. If it exists, it is probably the most endangered animal on the planet. Several years have passed since the canoe footage was shot, and it may be the last that is ever taken of what Teddy Roosevelt called the "Lord God bird."

Determined birders still search a forest the size of Rhode Island hoping for just a glimpse. With only a few dozen people there at a time, it's a lot of ground to check. Mr. Fitzpatrick says they won't go on looking forever. In addition, the graphics team says it is still possible that the bird in the footage is just a pileated woodpecker. In some ways, that puts them almost back where they started: in limbo.

But even if Cornell packs up and leaves Big Woods, the search won't have been a total loss. The process itself is also a triumph, and Mr. Greenberg says the digital bird weaving back and forth on the screen is the first of many attempts to model bird flight. Such a model could be used, say, in a computer game where students could tinker with variables to see how they affected flight, or learn what caused modern birds to evolve as they did.

And so, if the Lord God bird goes quietly into the night for a second time, its final gift may be a teaching tool for young biologists. And in a way, perhaps, the ivory-billed woodpecker will be back from the dead after all.



IMAGES FROM CORNELL LAB OF ORNITHOLOGY



The ivory-billed woodpecker (left), believed since 1944 to be extinct, may have been seen in an Arkansas bayou a few years ago. To determine if the bird in a video taken there was an ivory-billed or a more-common pileated woodpecker, the Cornell Lab of Ornithology created an animated digital woodpecker (above).

exactly right. Over the course of two years, they created a highly detailed computer-generated bird.

"We had the right volume and skin of the bird and the right bone structure," Mr. Greenberg says, "Now we had to make this bird fly."

That was the tough part. Mr. Greenberg says there is a dif-