

Speaking in Tongues

It's been said of those "American Idol" contestants that they sing like birds, but in truth there's an important difference between human and avian vocal gymnastics. In people, the mouth, lips and tongue play an important role in shaping the sounds coming from the larynx. In birds, though, it has been thought that the upper vocal tract has little effect on what's emitted from the sound-producing organ (called the syrinx).

Researchers at Indiana University have now shown that in one parrot species, at least, the tongue can alter sounds in a humanlike way.

Scientists have long wondered whether parrots use their tongues to alter their vocalizations, both because the tongues are fleshy and mobile and because some species make complex, humanlike sounds. Previous experiments, though, used sounds produced by the parrot, so it was difficult to tell the tongue's effect.

"What we have added is a direct indication that the tongue can do these things," said Dr. Roderick A. Suthers, an Indiana professor and an author of a paper on the work in *Current Biology*.

The researchers got around the limitations of earlier studies by replacing the syrinx with a tiny speaker, to control the sound coming from the parrot. (This required euthanizing the birds, but they were working with monk parakeets, a pest species that is captured and euthanized in

Florida.) Then, fitting the dead birds with a tongue-manipulation device developed by the lead researcher, Dr. Gabriel J. L. Beckers, they measured how precise tongue movements altered the sounds by changing the acoustics of the mouth.

The researchers identified four formants, patterns of frequency response linked to specific tongue positions. The human tongue creates formants, too; in American English speakers, for example, they are responsible for certain vowel sounds. So the finding that the bird's tongue has a similar effect, Dr. Suthers said, "suggests that in this respect, production of parrot vocalizations and bird songs are more similar to human speech than previously thought."

A Double-Edged Sword

In geopolitics, the domino effect — the idea that one country's rise or fall may lead to the rise or fall of a neighbor — has come in for its share of criticism. But in work on endangered species, a domino effect makes sense. If a certain plant becomes extinct, say, then an insect that relies on that plant to host its larvae may be in trouble.

New research by an international group of scientists shows the extent of the problem. The researchers, led by Lian Pin Koh of the National University of Singapore and Robert R. Dunn of Curtin University of Technology in Australia, designed a mathematical model and applied it to data