

tain organizations do lobby on behalf of their members, he notes, but Muncy claims that no group really plays the role of public science advocate.

Muncy is most proud of his space-policy bill. Modeled after Thomas Jefferson's Northwest Ordinance of 1784, Muncy says it provides for the exploration and peaceful colonization of Americans in space. ("An appropriate first step," the bill suggests, "would be the design, development, and construction of a permanent, manned, multipurpose space-operations center in low earth orbit.") The bill would also strive to ensure continuity for funding of appropriated space-science projects that must now fight on a yearly basis for their survival.

But space is only one of four foci outlined in ACT's June policy statement. The lobby plans to address issues and legislation affecting support for energy, basic research and education also. Among particulars spelled out are support for:

- increased basic research by industry, especially cooperative ventures with universities in technology-frontier areas such as cybernetics and cognition, planetary and stellar sciences, and molecular biology;
- increased emphasis on mathematics and the "hard sciences"—biology, chemistry, earth sciences and physics — at all levels in school;
- efforts to achieve national computer literacy, particularly among working adults;
- fusion-power development and standardization of fission-powerplant designs; and
- increased funding for science education projects at NSF and elsewhere that are aimed at "increasing the public's understanding of science, with the goal of sparking coordinated action by private and public-sector leaders to combat the nation's scientific illiteracy crisis."

As its name implies, ACT's priorities suggest a bias toward capital-intensive and high-technology programs. And as a lobby "for the public interest," it remains to be seen whether eventual supporters will in fact endorse those aims. (ACT plans direct-mail financial solicitations for individual, corporate and institutional members soon.)

Three of ACT's founders have already set up a Washington headquarters. However, their research base will remain in Charlottesville, Va., Muncy says, so that students can stay involved. And as a federal depository, "U.Va. has just as excellent a library for research purposes as the Library of Congress," Muncy boasts. ACT's advisory board shares a similar geographical representation. Members include: Leo Young (former president of the Institute of Electrical and Electronics Engineers); Mark Chartrand (executive director of the National Space Institute); David Ahl (publisher of CREATIVE COMPUTING); and Deborah Roberts (government professor at U.Va.). □

Subtle songs of cowbird courtship

A cowbird begins life as an invader in another species' nest. But it soon seeks the society of its own kind. Fitting into the flock requires social skills that include the singing of an appropriate song. An interplay of development, learning and communication can be observed in a cowbird's song. While the basic tune is genetically programmed, variations are learned and moderated in response to the bird's social surroundings.

The quantitative key to appreciating cowbird song is the dramatic female response to a mating call. Meredith West of the University of North Carolina and Andrew King of Duke University first described this copulatory posture. Within seconds of hearing a male cowbird sing during breeding season, a female cowbird will adopt a "hunkered down, tail up" position. West and King put a female in a soundproof chamber and play it a recording of a male song. The percentage of the trials in which the female reacts with the copulatory posture indicates the "potency" of the song.

Cowbirds raised in isolation from other members of the species sing an acceptable mating call. In fact, they sing the most potent version. West describes the call as a liquid-sounding "glug-glug" followed by a shrill whistle. Males raised in isolation always stress the first high-frequency note following the low-frequency "glugs."

While singing the most potent song makes the isolate a hit with the females, it gets him in trouble with the other males. The birds in a flock have a stable dominance hierarchy, which scientists document by keeping track of which bird leaves when two light on the same perch. Only the males at the top of the hierarchy are allowed to sing the most potent song. If an isolate sings it, he will be viciously attacked by the other males.

In nature, training before the breeding season ensures that a male sings the appropriate song. West says there are two aspects to this training in which a male sings and experiences the consequences. One aspect is the reaction of other males — that is, whether they attack. The other aspect is the more subtle response of females, whether they stay near the singer or move away.

West describes one example of females teaching a male what to sing. Eastern cowbirds and southern cowbirds sing slightly different dialects. A male of one locale surrounded by females of the other will alter his dialect to improve the female response. West and King even observe variation among females of the same locale in which individual male's song they prefer, although all prefer the class of songs sung by dominant males (or isolates) over the songs of the rest of the flock.

By breeding season, the songs of the



Photos: Laura Wiener

Changing in the brood: A female cowbird finds newly laid eggs in another bird's unguarded nest, she impales one with her beak and drops it to the ground. The next day she will lay her own egg in the nest and leave it to be tended by the nest's occupant.

males are fairly well set, West says, but she points out that the males always are ready to change their tune to exploit circumstances. If a dominant male is moved out of the flock, others start courting the desirable females and singing the more potent songs.

West plans to extend studies of vocalization and their responses to interactions between human infants and their parents. She hopes to find out whether the characteristics of this "motherese," the way people speak to a baby, are controlled by feedback from the infant. By precisely measuring the sounds produced by the parent and playing them to the baby, she plans to determine their effect on such infant behaviors as head-turning, smiling and vocalizing. West says, "This may begin to tell us which sounds are important for early language development and why some babies don't respond as well and as early as others." □