

## Chapter 54

### Evolutionary Aside 54.3—Lizards Play Paper-Rock-Scissors

A small lizard from the southwestern United States, the side-blotched lizard (*Uta stansburiana*), illustrates another unusual mating system, in this case with three different, genetically based, male strategies. One type of male is the dominant, aggressive male. These males have large territories containing many females. A second type of male is more sedentary. It has a smaller territory, usually with only one female, whom he guards very carefully. Finally, sneaker males have no territories. They move around a great deal and try to sneak into other males' territories to mate with the females within.

It turns out that none of these strategies is superior. Rather, the dominant males, being aggressive, have an advantage over the more sedentary males. However, because dominant males are so active and have such large territories, they are vulnerable to sneakers, who can slip in and mate with some of the females in their territories. Sedentary males, in turn, have an advantage over sneakers; because the sedentary males zealously guard their females, so sneakers have little opportunity to mate.

The result is a situation akin to the common playground game of rock-paper-scissors. In this case, dominant beats sedentary, sedentary beats sneaker, and sneaker beats dominant. Scientists have followed populations of the side-blotched lizard through time and have found that the frequency of the three types changes in a predictable fashion. When there is a high frequency of dominants, sneakers do well and sedentaries do poorly. However, as the frequency of sneakers increases, dominants decrease and sedentaries increase. In time, as the dominants become rare and the sedentaries common, sneakers are then at a disadvantage, and dominants begin to rise in frequency, and the cycle begins anew. This is, incidentally, an example of the phenomenon of negative density-dependent selection discussed in chapter 21, in which each type of male has highest fitness when it is rare.