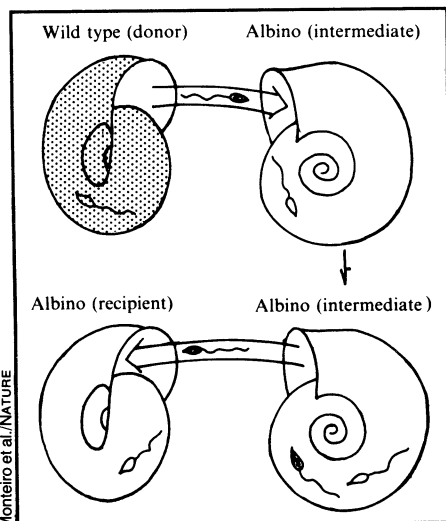


## Pass-along sperm, a snail sex option

In strategies for reproduction, simultaneous hermaphrodites seem to have the most alternatives. These animals can participate in procreation both as a male and as a female. In addition, in the absence of a suitable partner, the animal can fertilize itself. Now a group of Brazilian scientists has observed a fourth option. A snail can mate acting "mechanically" as a male, but transfer sperm to its partner that it collected when it functioned as a female in a previous mating.

This novel reproductive alternative was observed in Brazilian freshwater snails, *Biomphalaria*, which include species that carry the blood fluke causing schistosomiasis. The sexual option, called sperm sharing, was described in the April 19 NATURE by Warton Monteiro, José Maria B. Almeida Jr., and Braulio S. Dias of the University of Brazil in Brasília.



*Sperm sharing: Albino snail after mating with a pigmented, or wild-type, partner, transfers some of the wild-type sperm to its next mate.*

The scientists mated normally pigmented, or wild-type, snails with albinos, and afterwards paired the albino with a second albino snail. In 27 out of 97 experiments, they found that the second albino as well as the first laid some eggs fertilized by wild-type sperm. Such sperm transfer occurred in crosses both within a species and between two species.

What are the implications of this sperm sharing for snail evolution? Sperm sharing runs counter to the general view that animals always promote the propagation of their own genetic material. The Brazilian researchers suggest that natural populations, which commonly live in small bodies of water, experience so much inbreeding that there are few genetic differences between the sperm of one snail and the next. So there may be little reason for a snail to differentiate between its own and a

neighbor's sperm.

An alternative explanation is that under some conditions, it is advantageous for the snail to act as a female. "Sperm sharing could be a strategy enabling the snail to receive much sperm from its partners, while transferring relatively few spermatozoa of its own," the scientists say. They refer to such exchanges of mixed sperm as "sperm commerce."

John B. Burch of the University of Michigan in Ann Arbor has studied reproduction in a related group of snails. He says that so many sperm are transferred during a mating that it is not surprising, considering the snail's interconnected male and female reproductive tracts, that some sperm received during one mating come down the male tract in the next mating, along with sperm the snail has produced itself. "I wouldn't say that there would need to be any great evolutionary reason behind it," Burch says. "Consequences to snail evolution may be none."

—J. A. Miller

## Bird alert: Are your eggs your own?

Attention all cliff swallows: During nesting season, don't turn your back on your nest. If you do, chances are good that a bird from a nearby nest within the colony will slip into your home and lay an egg before you can say "soufflé."

This deft parasitic trick is designed to maximize the intruder's own reproductive success. It may do so at high cost to the host, however. A Princeton University researcher finds that host birds tend to lay fewer eggs per clutch than do parasite birds. What's more, the parasite swallow may throw out one of the host's eggs to make room for her own.

The behavior among colonial cliff swallows (*Hirundo pyrrhonota*) is the first reported case of brood parasitism among birds of the same species. The finding, described in the May 4 SCIENCE by Charles R. Brown, developed during field studies of cliff swallow colonies in southwestern Nebraska. It had been suggested that birds that nest in dense colonies might practice intraspecific brood parasitism, but Brown and his colleagues did not look for such behavior until they noticed unusual egg-laying patterns. In some nests, two eggs would appear in a single day, but each female bird can lay only one within 24 hours.

The researchers later observed frenetic attempts by the parasite birds to trespass into their neighbors' nests. In a rapid game of hide-and-seek, the parasite birds would wait until the host nest was momentarily unguarded. Then the intruder would fly into the nest, lay an egg, and leave. This took no more than 60 seconds. In one instance, an intruder entered and laid an egg in only 15 seconds, while the nest owner

fought off yet another intruder. In another case, two eggs appeared in a single nest within 29 minutes.

Brown says that up to 24 percent of the nests are parasitized by colony members, but that only about 7 percent of trespass attempts succeed. The researchers found that the switching occurred only within closely spaced nests, with the parasite and host nests no more than 2.1 meters apart. Because the eggs hatch at the same time, even when the host's eggs already are incubating when the parasite enters, he also suggests that eggs from a parasite may require a shorter incubation time than eggs of the host. Furthermore, estimates of brood parasitism frequency may be low because an intruder sometimes tosses a single egg from the host nest. If the parasite replaces the egg, this might not be detected by daily nest checks.

The parasites may benefit from this behavior because they hatch one or two more eggs per year than they would if they did not trick other birds into tending their eggs. The behavior is "rampant" among the species, Brown says, and is not confined to the colony studied. He thinks all of the cliff swallows may have the capacity to be parasitic — which ones succeed depends on luck and persistence. Based on observations so far, each parasite bird also tends its own nest and eggs, which raises another question. Is it possible for a cliff swallow to be both host and parasite? Brown says it is entirely possible, adding that if this is true, there may be no net gain from the egg-laying ruse.

—C. Simon

## Millions left for California telescope

The largest private gift ever received by the University of California, and certainly one of the largest private gifts ever made to scientific research in the United States, is a bequest of \$36 million in property, artworks and cash by the late Marion O. Hoffman of Los Angeles. She wished the gift to be applied "to assist in the construction of the Ten Meter Telescope as planned by the Board of Regents of the University of California."

The Ten Meter Telescope is planned to be almost twice as large as the largest existing telescope (SN: 7/28/79, p. 76). The expected site is Mauna Kea on the island of Hawaii. Its promoters have been looking for private gifts for several years. The bequest is a memorial to Hoffman's husband, the late Max Hoffman. Max Hoffman was an importer of foreign cars, such as Jaguar, Volkswagen, Porsche, Mercedes-Benz, Alfa Romeo, Lancia, Fiat and BMW.

Marion Hoffman thought that the Ten Meter Telescope, which involves very innovative engineering, would be a fitting memorial to her husband's lifelong interest in advanced mechanical designs. She died Dec. 16, 1983. □