territories when they move to another social group, presumably for good reason.

Patrick Bateson, of Cambridge University, England, has been developing the concept of optimal outbreeding, in which there are selective benefits to choosing a mate who is not so closely related as to risk inimical genetic consequences, but not so distant that any specific genetic adaptations to local circumstances might be diluted and lost. The optimal genetic distance, Bateson finds in free-choice experiments with quail, is around the first cousin level. Not straying too far while transferring from the natal group might therefore have its advantages.

A second, highly practical, reason why transfers might be local rather than distant is that for many species, including vervets, there is a very real and significant risk of predation and starvation in traveling alone across even modest distances.

For vervets, a third reason why migration to a nearby group might be prudent relates directly to the migrant's future reproductive success.

Vervets typically occupy small home ranges (0.4 square kilometer in the groups monitored by Cheney and Seyfarth at Amboseli) and individuals from one group can therefore readily observe those in another. "The animals spend a lot of their time watching neighboring groups," says Seyfarth. That this time is productively spent in assessing the social dynamics of the neighbors, rather than being mere idle curiosity, is indicated by the fact that of 13 males over the age of 5 years who transferred between the study groups, ten assumed higher dominance ranking in their new groups. "[The] males may have been able to time their transfer to maximum beneficial effect," comment Cheney and Seyfarth.

By restricting migrations to immediately neighboring groups, any particular vervet group is in danger of limiting the size and therefore the genetic diversity of the effective breeding population. The benefits that might accrue from optimal outbreeding, physical safety in short migrations, and enhanced dominance status on transfer are therefore potentially imperiled by the accumulation of inbreeding coefficients. However, population genetics calculations show that even a modest rate of migration into a cluster of neighbors from more distant groups significantly lessens, if not obviates, this danger.

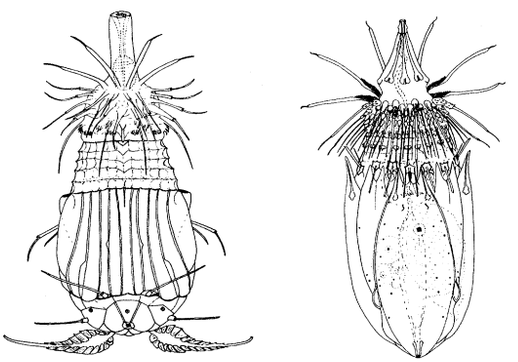
Whenever a male moves from one group to another he risks mating with his father's daughters and his brothers'

New Phylum Discovered, Named

For only the third time this century a new phylum in the animal kingdom has been discovered and described, bringing to 35 the total of these high-level (just below the subkingdom) classification groups. Robert Higgins, a researcher at the National Museum of Natural History, Washington, D.C., predicted the existence of the newly described animal in 1961 while still a graduate student. Higgins even found one in 1974, but failed at the time to recognize it as a novel organism. The honor of discovering and describing the new animal and naming the new phylum fell to Reinhardt Kristensen, of the University of Copenhagen, Denmark, who collaborated with Higgins on some of the work during 1982.

The organism, which is called *Nanaloricus mysticus* and occupies the newly erected phylum Loricifera, is one of many minute animals that live among marine sand and gravel at depths of tens to hundreds of meters below the sea surface. Known collectively as meiofauna for their diminutive size, these organisms represent relatively unexplored biological territory of great diversity (at least five separate phyla are represented, including the new one). The new organism has characteristics that, separately, are reminiscent of several other phyla but are unique in their combination. In addition, the mouth structure is a flexible tube that can be retracted into the animal, making the organism's body plan distinct from all others.

Kristensen first came across Loricifera in 1975, but mischance during tissue preparation for microscopy destroyed the single specimen he had. A year later he found larval forms in shell gravel off Western Greenland and in



Nanaloricus mysticus

The larval form (left) measures less than 195 micrometers; its rotor-like appendages allow it to swim very effectively. The mature form, right, measures about 230 micrometers and is sedentary. The combination of a free-swimming larva with a sedentary adult is unusual in the meiofauna.

a sample of coarse crystalline sand from the Chesterfield Reefs in the Coral Sea. Mature forms remained elusive, however, until April 1982 when Kristensen was on a field project at the Marine Biological Station in Roscoff, France. "I obtained a huge sample (more than 100 kilograms) of nearly clean shelly gravel from a depth of 25 to 30 meters," he recalls. "Unfortunately, it was my last day and time would not permit my using the standard $M_gCl_2^-$ extraction method; instead, I osmotically shocked the entire sample with fresh water." This expediency proved especially effective at loosening the tenacious grip that the Loricifera organisms hold on sand particles: "I found a complete series of life history stages of the new animals." Using the same technique, Kristensen found mature specimens of the new animal, although a different species, in Western Greenland a month later.

When Kristensen went to work with Higgins in August 1982, the two were able to confirm that Higgins's 1974 specimen was indeed a member of the new phylum, though a larval form. This specimen is of a different species, genus, and perhaps family, says Higgins. Early in 1983 Kristensen and Higgins found mature animals near the Smithsonian's marine biological station at Fort Pierce, Florida.

Kristensen's new phylum has been formally presented and well received at two international conferences in the past 2 months, and will be officially described in the next issue of *Zeitschrift für Zoologische Systematik und Evolutionsforschung*. For Higgins, there is the consolation prize of having the larval form named after him: Higgins-larva. "I'm very pleased of course, even though it is such an ugly creature."—**Roger Lewin**