



Creating the Nation's first BioPark

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Letter From the Desk of David Challinor
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Most men have their hair cut, and some even enjoy the luxury of being shaved by a barber. Many women enjoy facials, pedicures and other such pleasurable grooming by trained professionals. Barber shops and beauty parlors are big business and clearly fill an important human need. The same desire to be groomed or to derive a similar benefit is found among all animals. This letter will consider commensalism in various fish, reptiles and mammals as manifested in grooming either by conspecifics or by quite unrelated animals. Commensalism is defined as a relationship in which two or more organisms live in close attachment and in which one may derive some benefit, but neither harms or is parasitic on the other.

Perhaps the best studied example of commensalism is mutual grooming in primates, a behavior easily observed in zoos and the object of much research in the wild. Mutual grooming evidently enforces pair bonding and observers believe they discern an attitude of relaxed enjoyment in the animal being groomed. Among baboons manual dexterity is well developed and the groomer can handle individual hairs to remove small ectoparasites. Lemurs and other prosimians use their teeth, teeth which have in some species developed a comb-like structure to facilitate pelage grooming.

Among reptiles the legend has long existed that the Egyptian plover enters the mouth of basking crocodiles to clean the crocodile's teeth. The bird does live along river banks with crocodiles and certainly runs over the backs of basking individuals. Crocodiles often lie with their mouths wide open, evidently a thermo-regulating behavior, and the presence of the plover among such invitingly open-mouthed beasts must have given rise to this myth. That the plover actually enters the crocodile's mouth and "cleans" its teeth has not been documented.

Other reptiles, however, do use birds as groomers; the giant Galapagos tortoise is a good example. On the volcanic slopes of southern Isabella Island in that famous archipelago, Tom Fritts, a Fish and Wildlife Service scientist, watched a giant tortoise stretch its neck when it heard one of Darwin's famous finches. Fritts saw the finch alight on the neck and search for ticks to eat among the tortoise's folds of skin.



Along the laval rock shores of the Galapagos live marine iguanas, the only lizard known to graze on subsurface marine algae. Sharing these laval rocks is a marine crab with the delightful name of Sally Lightfoot. An article in the Bombay Natural History Society's Journal, Hornbill (1993-(2)), reported that these crabs removed ticks from basking iguanas. This is an unlikely behavior, as marine iguanas spend so much time in the ocean that they probably do not have ticks. They may have other small ectoparasites on their skin which the crabs might glean, but despite hours of watching crabs scurry among marine iguanas, I have never seen them actually feeding on iguanas.

There are crustaceans other than the Sally Lightfoot that we know are commensal groomers. Three genera of marine shrimp groom fish. The Caribbean shrimp, for example, attracts fish by waving its antennae. When the fish swim to the shrimp, the latter removes external parasites from the fish's scales and gill plates, and even enters the fish's mouth to scavenge food particles.

Tropical reef fish also enjoy the attention of some of the 600 species of wrasses. Some of the small tropical wrasse clean other fish, a phenomenon first observed in the 1930's by William Beebe, of bathysphere fame, in Bermuda waters. He watched a large blue parrot fish chomping on coral. After feeding for a while, its teeth and head scales were covered with coral pieces. It then positioned itself vertically and remained motionless while a school of tiny wrasses approached and consumed the scattered debris. Certain wrasse species, because they exhibit this behavior, are called cleaner fish. On some coral reefs they congregate at specific locations to which come much larger fish to be cleaned, with each individual apparently patiently awaiting its turn. The parallel to men waiting in a barber shop is striking.

The wrasses' successful exploitation of the cleaning niche has led another fish species to mimic a relatively common cleaner called the Blue Streak (Labroides dimidiatus). A blennie (Aspidontus taeniatus) has evolved to be the same size and have almost the same color pattern and approach behavior towards fish as the Blue Streak. The unsuspecting "customer" assumes its head up, head down or bottom up position and awaits the pleasure of being groomed. The blennie, however, darts in, nips off a piece of fin, and flees before the larger fish realizes what has happened.

Other fish are evidently incidental cleaners. Remoras, for example, attach themselves to large sharks by a flat sucking disc on the top of their heads. It had long been thought that remoras fed solely on the detritus from their feeding host. When a scientist checked the stomach content of a series of remoras,

however, he found them full of parasitic copepods. Copepods are a large group of small crustacea (crab family) that live in both fresh and salt water and probably outnumber all the insects in the world at any given moment. Only a relatively few copepods are parasitic, however, with some (generally females) living inside or on the external gills of fish. Copepods are a fascinating group of animals, generally not well known to laymen.

Better known to many people, especially visitors to African national parks, are the two species of commensal ox peckers, the red-billed and the yellow-billed. These starling-sized birds are brown with a short vertically flattened bill. Their sharp claws and stiff tails enable them to climb woodpecker fashion over the bodies of large domestic and wild animals to search for ticks and blow-fly larvae. Among some cattle and horse breeders the birds have a bad reputation for picking at open cuts and thus slowing healing, but their beneficial behavior more than outweighs their "bad" habits.

The subject of commensalism is a broad one and I have only touched on a few well-known examples. This cooperative behavior spans the evolutionary tree from primates (like us) to insects. There is even a small caterpillar, for example, that scavenges the unconsumed exoskeletons stuck in the web of certain spiders. The state of being commensal is surely a worthy one, and I refer back to the definition quoted at the beginning of this letter: "...and neither one harms the other." Is this not what human life should emulate? A utopian goal certainly as we all have to consume plant and animal parts to exist. The concept of "do no harm" engenders in me a warm feeling nonetheless, and who knows, it may someday be enjoyed universally if ever "manna from Heaven" should become a reality.

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