**Symbiotic Relationships**

**In return for being allowed to remain in the safety and shelter of ants’ nests, greenfly aphids allow the ants to milk them. To milk the aphid, the ant stands behind it and strokes its body many times in quick succession with its antennae. A drop of clear, tasty fluid appears from the hind end of the aphid’s body, which is soon lapped up by the grateful ants. Small black lawn ants actually farm these aphids, looking after their herds of aphids as a dairy farmer tends his cows. The ants build little mud sheds on stems and on leaf stalks that the aphids may hide from their enemies. At night the ants carry some of their herd back to the ant nest, returning them gently to the plants in the morning. During the autumn ants collect the tiny dark aphid eggs and carry them to their nest for protection during the winter. When spring comes, the aphid eggs are taken out of the ant nest and placed carefully on the correct food plants, where the ants will farm a colony of aphids to milk throughout the summer. *(Warren D. Thomas, in Astonishing Facts about Animals, p. 78)***

**One way to find food in the African bush is to follow the calls of the honey guide, a drab little bird that leads the way to honey that it has found. The bird flies ahead, a bit at a time, and then waits for you to catch up. Once at the cache, the bird waits quietly while you open the nest. African lore requires you to leave a piece of honeycomb for the honey guide. If you fail in this courtesy, the next time it will lead you to a leopard of something equally unpleasant. *(James Clarke, in The Star, Johannesburg)***

**Just before the chrysalis stage, when the caterpillar leaves the thyme plant, it wanders aimlessly about until it meets an ant or two. The ants show great interest, because the caterpillar has temporarily developed a gland on its back that secretes a sweet fluid when touched by an ant’s antenna. After teasing the ants with some of this sweet food, the caterpillar will hunch itself up in such a way that an ant can easily pick it up and carry it back to the nest. Inside the nest the caterpillar, with its tasty secretions, is an honored guest, and the ants feed it their own grubs. After growing to full size in several weeks in the safe and comfortable chamber of the ant host, the caterpillar stops eating and develops a chrysalis in order to begin its metamorphosis into a butterfly. In springtime the adult butterfly emerges from the chrysalis case, climbs out of the ant nest and up the nearest grass stalk, and flies away. *(Warren D. Thomas, in Astonishing Facts about Animals)***

**Polyp, fish, worm, plant, crab, mollusk, and plankton in symbiotic relationship (the habitual living together of organisms of different species) make up a coral reef. *(Isaac Asimov's Book of Facts, p. 127)***

**The crocodile bird, a type of plover, earns its living picking parasites from the teeth and hide of crocodiles in the Nile. When danger approaches, the little bird utters cries of warning. The crocodile, who knows a good thing when he sees it, never bothers his little feathered friend. *(Bernie Smith, in The Joy of Trivia, p. 114)***

**Light begets light: Fireflies really have few natural enemies. If they get caught in a spider’s web, the spider will free them. Bats and night flying birds will not eat them. *(Ann Adams, in National Enquirer)***

**As the seaweed curtains part on our undersea theater, a large, dark-colored, melon-shaped fish partially hidden behind some coral branches emerges. It is watching the antics of a tiny, garishly colored wrasse as the smaller fish bobs and weaves like a punch-drunk fighter. Wide-eyed, its mouth opening and closing, the larger fish slowly emerges into open water. As it comes into full view of the excited smaller fish, it begins to turn from a dark color to a pale blue. The color change now reveals dozens of tiny parasites affixed to its body, which stand out clearly against the blue backdrop. The hungry wrasse fearlessly munches on this delicious smorgasbord until the larger fish is completely clean and parasite free. *(Warren D. Thomas, in Astonishing Facts about Animals, p. 77)***

**The African honeyguide bird loves to eat honeybee grubs. The problem is its small size, which prevents it from breaking into the well-fortified bee nests. When the honeyguide finds a hive it flits about until it locates a honey badger, or ratel, who dotes on honey. It excitedly tells the honey badger all about its find and leads the animal to the site. The thick skin of the honey badger is impervious to bee stings. It calmly tears the nest apart with its long claws while the little honeyguide hovers overhead, waiting to grab some grub. *(Warren D. Thomas, in Astonishing Facts about Animals, p. 76)***

**Of course, humans live in symbiosis with trees too: trees take in the carbon dioxide people and their machines make and turn it into needed oxygen. And we plant and care for trees in return for the many benefits they confer on us. Unfortunately, it often takes the loss of trees to remind us just how much we depend on them. A leafy canopy shades about 30 percent of the average American city. But in many cities only one tree is replaced for every four that die. (Lowell Ponte, in Reader's Digest)**

**Lichens can grow in such stressed places because they are made up of fungi and algae living together symbiotically: the algae supply the fungi with carbohydrates, and the fungi supply the algae with minerals and much-needed shade. When they team up that way, they can live closer to the poles, higher up in the mountains, and farther out in the deserts than other organisms can. What is more, they can live in places that didn’t even exist in the earliest days of lichen-hunting – industrial wasteland, concrete structures, tarmacs, railway lines, abandoned cars. All have proved fruitful. *(Oliver L. Gilbert, in Natural History magazine)***

**Left to themselves, unpruned, mimosa trees have a life expectancy of 25 to 30 years. Pruned each year, which is what the beetle's girdling accomplishes, the tree can flourish for a century. Beetle larvae cannot survive in live wood, so the beetle backs up a foot or so and cuts a neat girdle all around the limb, through the bark. It takes her eight hours to do this cabinetwork. The limb dies from the girdling, falls to the ground in the next breeze, the larvae feed and grow into the next generation, and the questions lie there unanswered. The mimosa-beetle relationship is an elegant example of symbiotic partnership. It is good for us to have around such creatures as this insect and its partner tree, for they keep reminding us how little we know about nature. *(Lewis Thomas, in Reader's Digest)***

**When threatened, the blue-ringed octopus flashes dozens of brilliant blue rings across its body, a warning to predators that it is armed – in this case with highly toxic bacteria, powerful enough to kill a human, that live symbiotically in the octopus’s salivary glands. (Rafe Sagarin, in Learning From the Octopus, as it appeared in The Week magazine, March 23, 2012)**

**Orchid seeds lack an endosperm and must land near a certain fungus that they enter into a symbiotic relationship with in order to get the nutrients required to germinate. *(Don Voorhees, in The Super Book of Useless Information, p. 9)***

**The ox-pecker is the size of a starling. These little birds ride piggyback and derive their entire diet from the insects disturbed by their hosts, from ticks that grow in the hosts’ skin, and from the numerous flies that settle on their partner’s body. They spend almost their entire lives on the backs of antelopes, cattle, buffalo, zebra, and rhinoceroses. The large grazing animals happily tolerate the hungry little birds because of the benefit they derive from having ticks and parasites removed and also because the ox-pecker chirps a clear warning to its host if a man approaches from even several hundred yards away. *(Warren D. Thomas, in Astonishing Facts about Animals, p. 72)***

**The pony fish, however, does not produce its own light. Glowing luminous bacteria live in a cone-shaped organ in its abdomen. This relationship between the fish and the bacteria is an example of symbiosis, that extraordinary arrangement in nature where two entirely different creatures live together for their mutual benefit. In this particular partnership, the pony fish benefits from the concealing light while the bacteria receive a good home and nourishment. *(Francine Jacobs, in Nature’s Light, p. 53)***

**The cleaner shrimp perches on a sea anemone and cleans parasites off the teeth and mouths of fish - who line up to get groomed. The fish never eat the shrimp, each of which can take care of 24 or more “customers” an hour. *(Ann Adams, in National Enquirer)***

**Normally, winter kills most sp**i**ders, and it takes months for the population to recover. But this spring occupants of the spider motels awakened from hibernation healthy and ravenous. They scuttled into the fields in hordes ready to attack the insects attempting to suck the life out of the young rice and cotton plants. By protecting the spiders and giving them an early start, the Chinese increased their crop yields and avoided having to use chemical insecticides. *(Noel Vietmeyer, in Reader’s Digest)***

**Many species of trees are inhabited by the bacterium Pseudomonas syringae. When wafted into the air, the microscopic bugs are believed to act as ice nuclei, thus increasing the likelihood of rain or snow. In this symbiotic arrangement, trees provide a home for the bacteria and the bacteria help wring water from the sky for the trees. *(Lowell Ponte, in Reader’s Digest)***

**Whales are very special creatures. Turning them into margarine, pet food, shoe polish and lipstick displays unforgivable arrogance. But their extermination would mean more than just an irretrievable loss to civilization. It could even signal our own destruction: the more than half-million baleen whales that formerly roamed the oceans were an inestimable factor regulating the complex plankton economy of the sea. A major portion of the oxygen in the earth’s atmosphere is produced in this complicated ecosystem, and the removal of such a key element as the whale could jeopardize the supply of oxygen which supports the life of both whale and man. *(David P. Hill, in Reader’s Digest)***

**None of the man-made marvels of the world can compare to the simplest workings of nature. For example, take the yucca moth. She has a needle-sharp ovipositor which she sticks through the stalk of the yucca flower and lays her eggs inside. As she does it, she accidentally collects yucca pollen and pollinates the male part of the plant, thus ensuring her larvae they’ll have plenty of seeds to eat when they hatch. Since there are many more seeds than the babies will need, the plant isn’t harmed, and the survival of both plant and moths is assured. Without each other they’d die out. *(Bernie Smith, in The Joy of Trivia, p. 235)***

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