

## HEADS OR TAILS?

In the natural world there exists a wonderful and diverse array of living creatures. Yet, even more amazing than this broad diversity are the individual physical attributes that make each species outstanding in its own right. The brilliant tail feathers of a strutting Peacock, for example, are a wonder to behold. But imagine a Possum without its tail. Or a sightless Hawk. How about a Duck without its webbed feet? The animal world would be a much different place if the creatures in it didn't have the features that make each unique. In its eleventh season, the PBS television series **Wild America** includes several programs on the functional features that make up the whole animal and explores how the particular parts, such as tails, eyes, feet and headgear aid in survival.

The most prominent and impressive features in the Animal Kingdom are the horns and antlers of hooved animals shown in "Headgear." Marty Stouffer, host of the popular series, believes headgear are "the crowning glory of some of nature's most beautiful mammals." The antlers of Elk and Moose and the horns of Bighorn Sheep and Bison serve their owners well in defending territory, attracting a mate, digging for food and even scratching in hard-to-reach places.

Beginning in the spring, the solid bone of antlers grows from bumps on the forehead, called pedicles, into a new rack each year. During summer growth, the antlers are covered by a hairy skin called velvet, which the animals shed in autumn by rubbing their antlers against trees and shrubs. After the antlers, which can weigh up to 75 pounds for some Alaskan bull Moose, have served their main purpose of impressing and attracting a mate, they naturally fall off to unencumber their owners during the winter.

Unlike antlered animals, Bison, Sheep, Musk Oxen, and Mountain Goats retain their headgear throughout adulthood. Each year of life adds length to the horns as new growth forces the horns up and away from the skull. A core of bone grows from the skull, covered by a hard, fibrous material called keratin, the same material of human fingernails. According to Stouffer, as the keratin cover outgrows the inner bone core, "Horns can grow so large that some Bighorn Sheep have curls weighing 25 pounds or more." The headgear of horned animals, as they ram against their own kind in territorial defense, are among the most powerful animal appendages in nature.

At the other end of the animal is a body part featured in "A Tale About Tails." Tails perform numerous functions for the animals they're attached to, from swatting insects and cooling the blood in hot weather, to expressing emotion and showing off. Squirrels and Woodpeckers, which depend on tails for balance, find they have plenty of support from behind. Hibernating Squirrels often wrap their tails around themselves for extra warmth, while

Desert Ground Squirrels keep cool by raising their tails over their bodies like a parasol.

For Birds, tail feathers are almost as vital in flight as wings, since they act as a rudder for steering, an elevator when raised and lowered, and an air brake when coming in for a landing. Also important in courtship, the abundant spread of feathers of the Sage Grouse and Wild Turkey are fanned to attract potential mates. In stark contrast, the nearly naked tail of the Beaver is useful as a loud warning of danger to other Beavers when slapped against the water. During the hot summer, the Beaver stays comfortable by circulating blood to the tail where it's cooled by the outside air. Pronghorn have almost no tail, but the white hair on their rumps fluffs up when danger is near, and as they run away, their bobbing rumps give a visual warning. Of all the tasks the rear appendage can perform, perhaps the most obvious is that of conveying emotion. Happiness is no more recognizable than in the vigorous wag of a joyful Dog's tail.

Between the head and the tail are some of the animal's most purposeful parts. Sensory organs give animals their indication of where to find food, when to lunge for a catch, and when danger is near. Eyesight is one sense that varies greatly among all of nature's creatures, as we learn in "The Eyes Have It." Some creatures, such as Earthworms and deep water Fish, have eyes that can only detect the difference between light and darkness, and must rely on other more developed senses. Mice and Rabbits' eyes are capable of not much more than detecting movement, a very important function for animals which must flee quickly to escape attack. More advanced eyesight, belonging to Hawks and Mountain Lions, allows predators to recognize shapes or the nature of an object.

Each animal's eyes are strategically located, depending on what objects are most important for them to see. As Stouffer explains, "Predators have to spot any moving prey in front of them. That's why Owl and Wolf eyes are located close together in the front of the head. The animals they prey upon, like Mice and Deer, must be aware of danger on all sides. As a result, their eyes are widely separated--one on each side of the head. That way, hunted animals have a clear view of the whole terrain." In Stouffer's view, between predator and prey, the game of "I Spy" in nature is for real, and "survival depends on who sees whom first."

Taking a look down, we come to the feet--the animal's support and tool for many uses. Feet come in a myriad of shapes and sizes--furry, hooved, clawed, webbed, five toed or two toed, quick or cautious. Stouffer will surprise many viewers this season when he proves that "Some Feet Have Noses." "Strange as it seems, some creatures actually smell with their feet," says Stouffer. "Sea Stars, or Starfish, for example, can breathe and smell with their toes, and Spiders have 1,000 hairs on their first pair of legs that allow them to sense

certain smells." Butterflies also possess a sense similar to taste on the clawed tarsi that serve as their feet. When the tarsi make contact with sweet liquids, such as nectar, the Butterfly's proboscis, or tongue, rolls out for a drink.

Though most other feet don't perform as impressively by tasting or smelling, they do give their owners plenty of ground to stand on. The Mountain Goat has big, broad feet with leathery soles and two main flexible toes that can spread wide apart for amazing stability and grip. "What's most impressive about this animal," says Stouffer, "is how it makes scaling up steep, rocky mountain sides look as effortless as crossing the street." Its mountainous neighbor, the Bighorn Sheep, has soft and cushion-like soles, allowing the Bighorn to keep its balance as it moves steadily across uneven or slippery ground.

Among the most powerful feet in nature are those belonging to a headstrong cousin of the Weasel. "Belligerent As A Badger" spotlights a striped digging sensation. At the end of the Badger's strong, stout front legs are inch long curved claws that break the earth like a shovel, while its hind legs throw dirt out of the way. Though the Badger is a poor runner, it is the fastest digger of any known mammal and can easily burrow to safety from any danger.

While most of the time feet are just complementary aspects of a larger creature, some animal parts seem to take over the whole animal. "The Beauty Of Butterflies" shows us that this insect is almost all wing. Two fore wings and two hind wings give the Butterfly its flight, its camouflage for protection, its mimicry of poisonous animals to keep predators away, and its color for gender recognition. Wings can be triangular, roundish, squarish and are composed of millions of shingle-like overlapping scales which give them their color and pattern.

Though not all aspects of the animal are as magnificent as the Butterfly's wing or as keen as the Hawk's vision, each is equally important to the every day survival of that species. There are endless attributes of all creatures, and according to Stouffer, "their discovery and study contribute to our continued understanding and appreciation of the natural world." Whatever the feature that makes each creature stand apart, we can be glad that such diversity exists.