



Wolf pups follow an adult pack member back to their den.

*Jim Brandenburg/Minden Pictures*

# Animal Parenting

By Eric Hoffman

**H**ow animals raise their young varies as much as the animals themselves.

Parenting is a subject all of us think we know something about. For better or worse, all of us have been parented. Among humans, quality parenting has often been cited as the key to a successful society. Among nonhumans, parenting is serious business as well. It is the work of nurturing the young in ways that result in survival of not only individuals but whole species.

Parenthood in the animal kingdom takes many forms: it may involve two parents or just one; at times herds or troops contribute. And there are even creatures who prepare diligently for their young but are nowhere to be seen when their babies enter the world. Regardless of what's behind a

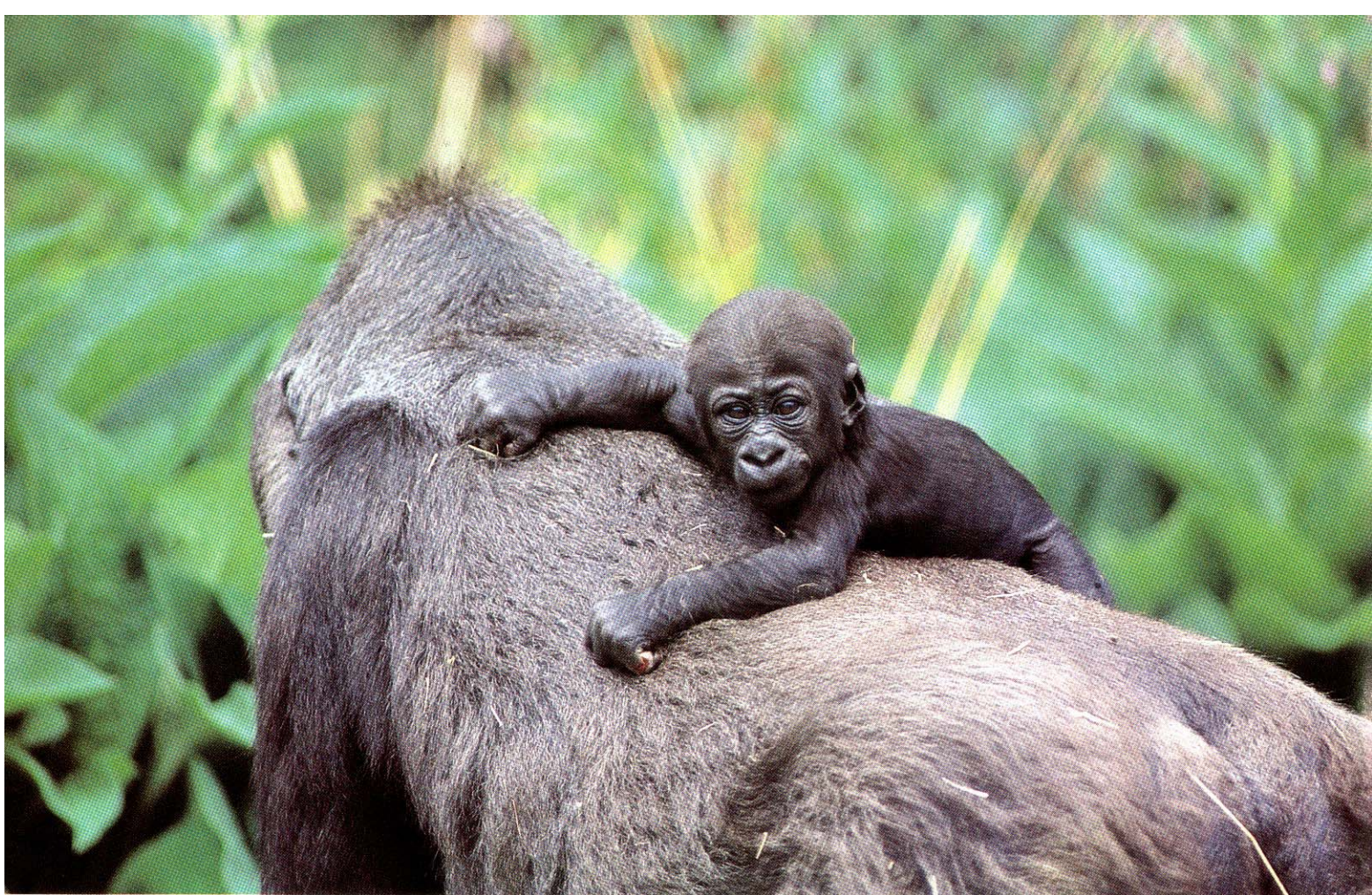
particular parenting behavior, there is no shortage of unusual strategies, anatomical oddities, and role reversals.

Motherhood is rough in the animal kingdom. Aside from the energy needed to produce eggs and bear young, it is the females that most often build nests, provide food, and teach and guard the young. Frequently polygamous males take the quantity approach, spending their efforts competing for other mates with which to create yet another brood.

Among mothers, North American bears—polar, grizzly, and black bears—have a well-deserved reputation as being fiercely devoted, yet they begin their motherhood seemingly unaware that they have even given birth. Tiny newborns, weighing between one-half and two pounds are born in midwinter, while their mothers hibernate. The cubs live by suckling their slumbering mother, whose unique biology allows her to convert fat to milk and recycle waste products from the blood stream.

In the spring the family emerges from their den.





A lowland gorilla baby makes use of its grasping ability to hold on to its mother's back.

John Cancelosi

## Parenting

The curious, mischievous youngsters begin investigating the larger world, with the sow acting as steadfast instructor, guardian, and source of sustenance. Mothers will fearlessly drive off male bears one-third larger than themselves—a necessary task since males will sometimes eat youngsters. And they often have two cubs in tow for two years or more while the cubs learn to forage. When the cubs are ready to live on their own, their previously dotting mother may become a snarling threat, chasing her cubs up trees to break the maternal bond.

Though they may not look it, alligators and other crocodilians are nurturing and protective mothers. The alligator's two-sectioned uterus is structured like a bird's, not a lizard's as one might expect. Fibers for the eggshell are produced in one part, while calcium necessary to harden the shell and guard against water loss is produced in the other.

These reptilian mothers build and guard nests in which they lay about a dozen eggs. Once the hatchlings begin to emerge, they emit a low-toned chirping that signals the mother to tear open the top of the nest chamber. Many crocodilian species assist the young to the water by carrying them in their mouths. The hatchlings, collectively known as a pod, remain together at first, often traveling close to the mother.

From hamsters to lions, crocodiles, and gorillas, male parental responsibility often ends shortly after courtship and mating. Perhaps because of some type of primeval alliance with my own gender, I find it reassuring that there are fathers

within the animal kingdom that more than pull their weight when it comes to rearing young.

The curiously bizarre sea horse, for instance, which looks more like a knight in a chess set than the fish that it is, is an exemplary father. The male sea horse literally shares in pregnancy. In a delicate courtship ritual that involves touching noses and intertwining tails, the female transfers eggs to the brood pouch on the male's abdomen. He fertilizes the eggs and swims around with his pouch bulging. The eggs hatch but stay in the pouch until his contractions pop them out one at a time into a saltwater world of sea grasses.

The tiny, male three-spined stickleback may be no bigger than your big toe but plays a large role in bringing stickleback fry into the world. This fish spends about a week building a nest on the pond bottom by scooping up mud and filling the indentation with water plants and debris. A stickleback dad-to-be then secretes a fluid over the plant matter and compacts the pile by repeatedly rubbing and banging against it. He then tunnels through, creating a narrow slit just big enough for a stickleback.

While the stickleback builds his nest, his belly becomes bright red, which attracts a female. He entices her into his nest, where she lays eggs. He promptly expels her and begins fanning the eggs with his fins, breaking away only to chase off predatory fish. When the eggs hatch, the father rearranges the nest, creating a home for his fry that he guards vigilantly. If one of the brood strays from the nest, he sucks it into his mouth and returns it. After about a week, his



parental chore is complete, and the young disperse.

The thimble-sized male Darwin frog of Argentina also carries developing young within his body. When a female frog prepares to lay eggs, all male frogs in the neighborhood gather. Once the eggs are laid, the males lap them up and deposit them in a pouch below their mouths. When the eggs hatch into tadpoles, the males' pouches expand to accommodate their wiggly, little companions. Only after the tadpoles become frogs do they leave their fathers' mouths.

The two-toned poison-arrow frog, a favorite of Amazon native hunters because they provide a deadly toxin used on arrows, may have the strangest parenting mission of all fathers. The female lays eggs on the ground, where they hatch into tadpoles that squirm onto an adhesive area on their father's back. There they cling with tiny suction-cup-like mouths. The father frog carries his young through the jungle as he searches for food, making sure to soak in puddles along the way so that his tadpoles don't dry out. When the tadpoles gain sufficient strength to survive on their own, they swim off his back.

(Unusual parenting strategies also extend to frog species that rely more on the female. The elusive Australian

**An ostrich father will guard the eggs of his hens, which are placed in a single nest. A male will typically mate with a "major" hen and two "minor" hens.**



Frans Lamting/Minden Pictures

Gregory G. Dimijian, M.D./Photo Researchers, Inc.



**A poison dart frog father carries his young on his back, often soaking in puddles to keep the tadpoles moist.**

gastric brooding frog, for instance, swallows about 20 fertilized eggs. While carrying the eggs, the female abstains from all food and produces a hormonelike substance that enables her to completely shut down stomach functions, creating a safe environment for the eggs to develop. The young are then vomited up as tadpoles and froglets.)

Even among mammals, father standouts can be found. Male wolves are among the most devoted fathers. They hunt and provide food for the pups and their mother. Father wolves also take time to play with their pups, teach them to hunt, and are generally patient, doting fathers.

Nevertheless, wolf fathers—like arctic foxes, coyotes, river otters, and other predator species in which males procure food for the family—are not entirely trusted in the early weeks when pups are still naked and entirely helpless. Rather than face the protective wrath of new mothers, male wolves will often deliver food to the entrance of the dens, but not enter until the pups are older. Otter fathers are driven away from the babies until they are half grown, at which time the father returns to help raise his young.

**A** joint approach to parenting occurs frequently in nature. Such dissimilar animals as foxes, eagles, and gibbons practice joint parenting. Bald eagles, which pair for life, have an approach so "traditional" that it would please a fundamentalist preacher: the males bring home the bacon while the females remain in charge of the nest. The eagles work frantically to provide food for their young and themselves.

Emperor penguins from Antarctica eschew the eagles' hectic pace, adopting instead the "sedentary-fat-utilizer" approach. The mother lays the egg, but the male takes over incubating responsibilities by rolling the egg into a specially designed flap hanging from his abdomen. With the egg tucked away, the father huddles with other males for about 60 days through night after night of subfreezing temperatures and howling winds.

When the downy chick hatches, it peaks out from





Peter Arnold, Inc./Myma Wantanabe

**Alligator mothers guard their nests and will carry hatchlings to the water in their mouths.**

between its father's feet to peer at a stark white and icy world. Even though dad has not eaten during his entire watch, he can still feed the chick by upchucking a food that looks something like clam chowder. About the time when the male's fat reserves are depleted and he's lost up to 30 to 40 percent of his body weight, the mother penguin returns and relieves her mate. While the father takes to the sea to feed once again, the mother finishes rearing the young until the Antarctic spring arrives. Perhaps the most amazing creature that depends on fat reserves for parenting is the Northern elephant seal. Once bulls climb onto land for the 90-day mating season, they live entirely off stored fat: they don't eat, drink, or urinate.

The cows fast also, and, while maintaining their own bodily needs, lactate what may be the richest milk of any mammal. Elephant seal mothers pass a full third of their body weight to the pups, whose weight commonly skyrockets from 65 to 400 pounds in less than 30 days. For every pound the pup gains, its mother loses two—the most efficient exchange among mammals.

But a month after birth the mothers abandon their pups, which are called weaners. The weaners remain on the rookeries for two months, lying helplessly in the sand and splashing around in tide pools. Once again, survival may depend on sufficient stores of fat, since the weaners don't eat or drink until they've completed a sort of neurological metamorphosis that readies them for life in the open sea.

If an elephant seal pup could talk, it would probably express relief and stoic acceptance of the fast when compared to the dangers it was subjected to when the adults were around. Elephant seals are good enough mothers, though quarrelsome and sometimes disposed to bite an errant pup or outright kill one who makes the mistake of nursing from the wrong mother's teat. But even this takes a back seat to the rough, steam-roller behavior of the fathers. Huge bulls challenge and charge each other for breeding rights, often crushing pups to death in the process.

Secrecy is a virtue when raising vulnerable young. Top contenders for most secretive parents are the duckbill, or platypus, of Australia and Africa's hornbill.

The duckbill, a furry, egg-laying animal, has glands

## Parenting

for producing milk but not the traditional teats of other mammals. Mothers dig a tunnel into a riverbank or along a stream for depositing eggs. The tunnel is sealed with compacted mud each time the mother finishes foraging and comes back to feed her young. Their nocturnal comings and goings and aquatic stealth has yielded few firsthand accounts of what a baby platypus looks like. To this day, the species has not been observed mating.

Motherhood for a hornbill, a large bird with an incredible bill, means living in a self-imposed solitary confinement while incubating her eggs. Sealed into a tree cavity, she depends on her mate to fetch food and shove it into the cavity through a tiny hole. Native folklore had it that the hornbill was spurning her lover, which isn't the case. The strategy is designed to keep snakes and monkeys out of the nest, and it usually works.

Being social has its advantages, too, and group behavior often increases the chances for survival of young. Musk oxen, for instance, assume a singular defensive posture among large ungulates. When wolves draw close to a herd, the adult oxen form a circle or semicircle with their heads facing the menace. Calves huddle behind the herd while its members out wait the predators. Bulls may actually break from the group to attack a wolf. Scraping thick horns along the ground, they attempt to kill the wolf by flinging it into the air and then crushing the enemy with their hooves.

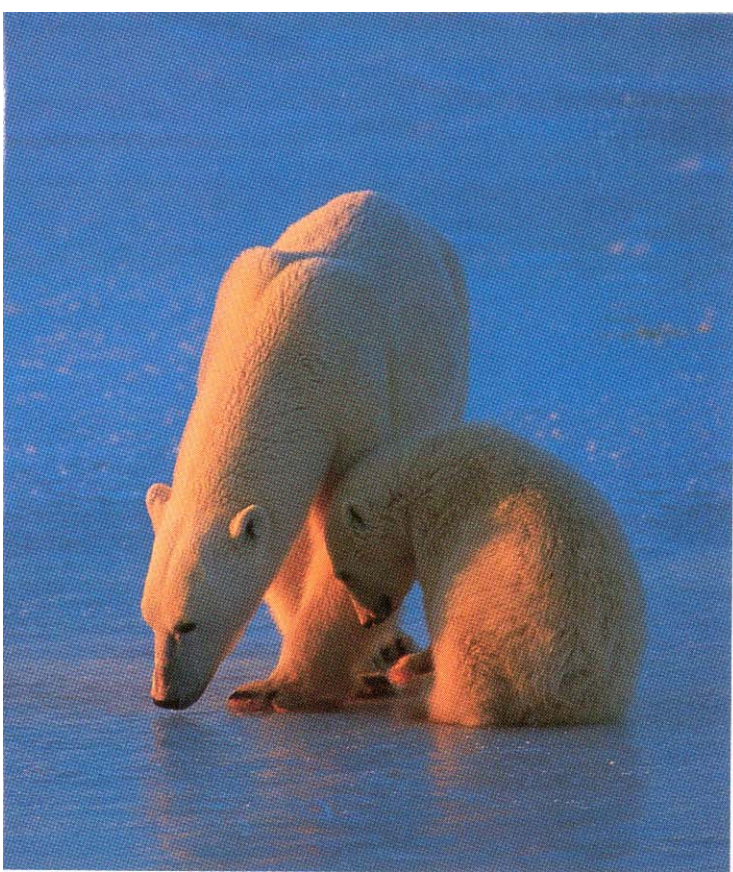
The social arrangements of primates vary from species to species, but there are common traits when it comes to producing young: single births and a longer dependent childhood. The longer dependency on its parents places increased emphasis on the grasping ability of primates, since youngsters must hang on when traveling out of the nest with their mother or father. Even newborn human babies are known for surprisingly strong grips.

**Musk oxen form a protective ring around the herd's calves to defend them against predators.**



Jeff Lepore/Photo Researchers, Inc.





Kathy Watkins / Image of Nature

**Polar bear mothers keep their cubs with them for up to two years. At birth, the cubs are only three to six inches long.**

**S**uch grasping ability may be particularly important to siamangs—furry, gibbon-family apes that possess amazing acrobatic skills that allow them to swing and leap through the forest canopy at high speeds. Females head the siamang family and share parenting responsibilities with males, who carry babies once they are weaned. Both parents take time out to play and interact with their young, and offspring often stay with their parents for up to six years.

Judging parenthood in human terms doesn't always work in the world of animals: here what preserves the



species gets its evolutionary reward. The brown-headed cowbird lays its eggs in other birds' nests, usually picking on smaller birds. The cowbird chick is born with a reflex to push everything else from the nest. A few days after hatching, only the cowbird chick remains—with its unknowing foster parents feeding the intruder.

Among lions, and occasionally among some primates such as gorillas, infanticide occurs when a dominant male kills the young offspring of his newly acquired females. No one is sure why this occurs, but it may be in order for the female to come into season quicker and therefore be ready to carry on the new dominant male's genes.

Beyond this darker side of parenting comes the bizarre—like the hermaphrodite earthworm. When a pair of earthworms mate, sperm is exchanged between both worms,



Jeff Foott / Valan Photos

**Cowbirds trick other species into parenting their chicks. Here, a pair of yellow warblers unsuspectingly tend to cowbird chicks that hatched in their nest.**

stored, and then used to fertilize eggs. The worms can also regenerate missing parts and reproduce this way as well.

Such strategies may be foreign to the scenes of parenting that we, as humans, react most strongly to: nursing, comforting, teaching, protecting. The work of animal parents may include all this and more—or it may include none of these duties. As baby animals begin their journey into life some parents' work is done, some just beginning. But one thing is certain. Without the work of parents, the journey could not be made.

---

*Eric Hoffman writes on wildlife and related subjects. His latest book, *Adventuring in Belize*, will soon be published by Sierra Club Books/Random House.*