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THE MEANING OF FROGS (AND TOADS)

Frogs are the most common animal on earth.

They first appeared on the earth about 300 million years ago and new species are still being identified.

They are found in every ecosystem and habitat from deserts to wetlands : from sea level to high mountain tops although most are found in the tropics.

For many of us our fascination with frogs started in childhood with the discovery of tadpoles in a creek or pond and watching as they changed from a fish-like water animal with a tail and gills to a land animal with legs and feet. They are the only vertebrate to be born with gills. As they mature they lose their gills and tail and spend at least part of their time on the land.

Amphibians were the first order of animals to emerge from the sea and live on the land.

Frogs are from the order of amphibians which in the Greek meaning "both lives." They spend part of their life as a water breathing water animal and part of their life as an air breathing land animal.

Amphibians evolved from primitive fish, which were the first vertebrate animal. Amphibians were the first creatures capable of living on land and breathing air. As they moved from water to land, they found a new environment that was more favorable to their development than water.

The frog belongs to the order, ANURA which means "without a tail", having lost theirs through a process called metamorphosis.

The Latin name for the frog is RANA which means noise. The first voice, not the first sound, but the first voice belonged to amphibians. They were the first animal with a voice. Others could make noise but only the amphibians had a voicebox to make sound. I grew up with the spring and summer music of spring peeper tree frogs and bullfrogs. Peepers trilled somewhat like a cricket and bullfrogs "jurrummed" like a bass fiddle. There is even a barking frog that is said to sound more like a bull terrier than a bullfrog. And it is said a half-swallowed frog screams like an injured child or a trampled cat.

PHYSICAL CHARACTERISTICS

Frogs and toads have long, strong hind legs with which to jump and amazing jumpers they are, as attested to by the famous frog-jumping contest in Calveras County, California (home of Mark Twain's story, "The Celebrated Jumping Frog of Calaveras County"). The bullfrogs in the California contest can jump 18 to 20 feet in the three jumps given each frog. An adult frog can jump forty times its length in one leap!

Despite this frogs usually only stay a few hops from water because they are even better swimmers than hoppers. Once in the water they swim like "greased lightning" and can hide in the mud in seconds. They have five toes on each hind foot and most have webbed toes to facilitate swimming. They have short forelegs with only four toes on each forefoot.

Some frogs have small suction discs on their toes which help them climb. With the help of these suction cups they can even walk up a glass window pane.

DEFENSES

In addition to jumping and swimming frogs defend themselves by puffing up and playing dead. If a frog looks too large to swallow or like a piece of carrion snakes, turtles and other predators will pass them by since most animals don't eat carrion.

Some frogs defend themselves by flying, which is more like the "hang-gliding" a flying squirrel might do. Most frogs secrete foul tasting mucus through glands in their skin and a small number of South American frogs secrete highly poisonous mucus.

APPEARANCE

Frogs and toads have tailless, short bodies with no neck which makes it impossible for them to turn their heads. The frog's head is broad and flat and his mouth is very wide. His wide set eyes sit atop his head and are large and bulging. Some frogs have yellow eyes, some red, and some a bizarre metallic gold. Some frogs eyes have round pupils like ours; others are slits like a cat's.

SIZE

Most frogs are rather small. The smallest is a Cuban pygmy frog which is less than one-half inch (1cm) long. The monster among frogs is the Goliath frog of Africa. It measures three feet long and weighs up to seven pounds.

AMPHIBIAN FEATURES

As millions of years passed amphibians looked less and less like fish and developed their own features.

The amphibians were the first land animal with a backbone. Their long, bony skeleton centers around their backbone which contains a spinal cord. They have no ribs so when you hold one you feel nothing but backbone and the bulging insides. To hold one makes for a weird sensation somewhat like holding a blob with a beating heart.

Amphibians, like fish, are cold blooded. They can produce very little body heat rather taking their temperature from their surroundings. Because of this they spend energy seeking places that will keep their body temperatures reasonably stable and consequently in the winter they hibernate, often in the bottom of ponds absorbing enough oxygen from the water to remain alive.

Unlike reptiles which have dry, scaly skin, amphibians have moist, cool, slimy skin. Much of their breathing occurs through this moist skin. They don't drink water but rather absorb it through their skin. Their skin is slimy because they secrete foul tasting and in some instances, deadly poisonous mucous from glands in their skin. This mucous helps keep them from drying out and helps them elude predators. As mentioned earlier a small number of brilliantly colored South American frogs secrete so deadly a poison that some Indians use it to tip their poison arrows.

Most frogs have very small teeth with which to grasp and hold prey while they swallow it.

FROGS AND TOADS

Although in this paper I have generally referred to both frogs and toads as frogs a frog and a toad differ in several ways. A frog is usually smaller and brighter in color than a toad. A frog's skin is smoother and more moist than a toad's which tends to be rougher, dryer and more warty. A frog's body is longer and thinner than a toad's and his hind legs are longer and his toes more deeply webbed. Also frogs spend more of their time in or near water than toads which spend most of their time in cool, moist places on land.

THEIR FIVE SENSES

Amphibians have the same five senses we humans have: sight, hearing, smell, taste and touch. The frog's eyes are large and set high and wide on his head. Frogs and toads are very adept at detecting and reacting to the slightest movement but cannot detect something that is still. A fly can freeze just inches away from a toad and escape attack unless it twitches or moves.

The amphibians were the first animals to cry tears. The eyes of fish are kept moist by the water in which they live. A fish's eye dries out quickly if out of water very long. The early amphibians developed glands in their eyelids to keep their eyes moist. They were also the first creatures on earth to have eyelids which helped prevent their eyes drying out and protected their eyes from dirt and abrasion. Frogs and toads have no ability to blink their eyes as we do but can close them by retracting their entire eye into their head. As they do this their eyelid which is attached at the base of the eye is pulled up and over their eye. The eyes of a frog or toad actually help it swallow its food as the retraction of its eyes helps push its food down its throat.

Frogs and toads have excellent hearing although they have no ears but only external eardrums to the rear of their eyes.

Frogs and toads have organs for smell, taste and touch though some of these senses are rudimentary.

FOOD

Insects are the main food of frogs and toads. Frogs and toads also eat snails, slugs, worms and spiders.

They catch their food using their long sticky tongue, which is attached at the front rather than at the rear of their mouth.

ENEMIES

Frogs and toads have more enemies than any other wild creature. They are hunted for food by turtles, moles, skunks, rats, badgers, otters, foxes, weasels, snakes, ducks, crows, owls and herons. A frog or toad that escapes its predators can expect to live about three years.

IMPORTANCE OF FROGS AND TOADS

Since amphibians eat insects they are natural pest controllers and what's more they work the "night shift" while other insect eating animals are asleep. One garden toad can eat 500 flies an hour. It has been estimated one toad saves fifty dollars worth of a farmer's crops a year from insects.

The work of the eighteenth century Italian anatomist Galvani used frog legs to demonstrate that a chemical reaction could produce an electric current. This is the principle used in storage batteries. Most of us learned about the basic structure and function of vertebrate animals by dissecting a frog in high school or college biology.

Research of frogs have given us much basic knowledge about the structure and function of our body.

Frog legs are considered a delicacy by many especially the French who reportedly consume 3,000 to 4,000 metric tons of frog legs each year. It takes 20,000 frogs to supply one metric ton of frog legs.

While not as popular as dogs or cats, frogs are kept as pets. From time to time I have kept aquatic frogs in my aquarium and except for jumping out of the tank and drying up in a corner somewhere they are an economical, low maintenance, quiet pet.

ECOLOGICAL ENVIRONMENTAL MARKERS

Frogs, toads and other amphibians are disappearing in large numbers from all six continents on which they are found. Dramatic die-offs have been reported in at least 25 countries. Many of the same human activities that have troubled other species have also threatened amphibians.

In a recent article in Scientific American, Blastein and Wake speculate on "The Puzzle of Declining Amphibian Populations." The article states,

" Amphibians are valuable as gauges of the planet's health for a few reasons. First, they are in intimate contact with many components of their natural surroundings. For example, as larvae, frogs live in water, but as adults most find themselves at least partially on land. Their moist, delicate skins are thin enough to allow respiration, and their unshelled eggs are directly exposed to soil, water and sunlight. As larvae, they are herbivores, as adults, carnivores. Because amphibians sample many parts of the environment, their health reflects the combined effects of many separate influences in their ecosystem. Second, these animals are good monitors of local conditions because they are homebodies, remaining in fairly confined regions for their entire lives. What happens to frogs and their brethren is happening where humans live and might affect our species as well.

Which environmental factors might account for the rapid decline of animals that have managed, over hundreds of millions of years, to survive events that led to the mass extinction of many species, including the dinosaurs? The explanations that have been proposed are almost as diverse as the amphibian species in jeopardy, ranging from destruction of habitat to natural fluctuations in population rates."

What is killing the amphibians? Scientists are not sure. Some say it is a periodic, temporary decline. Others say acid rain, pesticides and the disappearance of the ozone layer with the subsequent increase of ultraviolet is at fault.

Many frogs and toads are teetering on the brink of extinction, not because of snakes or raccoons or owls, but because developers want land to build on and farmers and cattle producers want cheap land so supermarkets can sell cheap foodstuff and cheap meat. In the process frogs and toads and everything that depends of them are sacrificed.

Whatever the cause it is not good news for us. We share the world with amphibians, so if something in the environment is killing them, inevitably it might do the same to us. We must remember when the environment is unhealthy, all living things eventually have to pay the price. Frogs and toads have survived for millions of years. Except for us, they might survive millions more. If we push them into extinction, we will sever one of our few remaining ties to the days when life committed itself to the eventuality of our existence.

Frogs are natural Taoists. They follow the path of least resistance. They are not aggressive fighters, they don't attack or bite. They don't hunt their food but rather sit and patiently wait until it passes by and then they nab it. A frog doesn't even go out of its way to find a mate. It just waits, as some people do, "until the right one comes along." When it gets too hot frogs move to a

cooler place. And when it gets to cold frogs burrow in the ground or sink to the bottom of a pond and wait for warmer weather.

FROGS IN OTHER CULTURES

Since the frog's habitat is so widespread it is represented in nearly every culture.

In Mexico and Central America it is a fertility symbol as is evidenced by these Mexican frogs with both male and female genitalia.

American Indians saw the frog as a weather forecaster, predicting rain.

East Indians liken the croaking of frogs to the chanting of their sacred texts and prayers.

In Burma frog shaped amulets are worn by children to protect them from the "evil eye."

In Japan the frog is a symbol of energy and persistence.

In China frogs are so highly regarded they have been given the honorary title of "Heavenly Chicken" and statues of frogs are set in rice paddies in hope of plenteous rains.

FROGS IN SONG

Who isn't familiar with the folk song, "Froggy Went a Courtin'?" Although my wife had given me this "Dr. Frog" in the early seventies, it was a song that launched my frog collection ten to twelve years ago when Chet Atkins came to Lexington, KY, where I then lived, and gave a Pops Concert with the Lexington Philharmonic. During this concert Mr. Atkins sang the song "Frog Kissin' " that he'd written with Ray Stevens. I liked the song because I thought it was a good metaphor of what I did in my work as a psychiatrist and got a copy of the song. Soon afterward a lady asked what I did in my work and I played the song "Frog Kissin'" for her. It wasn't long before she brought me a frog thereby launching my frog collection and my family, friends and patients began to give me frog memorabilia. My collection has grown by leaps and bounds to the point that I now have three or four hundred different pieces of frog memorabilia.

I have a short video to show you the frogs I have in my office on North Drive. I brought a few of my many frogs and a short video to show you some of the variety and diversity represented in my collection.

What is some of the personal meaning of frogs to me?

As I said my first frog was "Dr. Frog" whom my wife said, only half in jest, looked like me. As I have contemplated "Dr. Frog" over the years I have come to agree I do look much like him.

Frogs aren't particularly pretty animals and are even frightening on first encounter but they are very common, very gentle and very useful. Like a frog, although not the handsomest of creatures I am useful and familiar. And though I usually don't make the most favorable first impression I am generally found, with repeated contact, to be likable if not lovable.

The frogs like the mythical dragon, is a good symbol of the love/hate dilemma or paradox that characterizes the human condition being a little lower than the angels with our head in the air and having bellies that drag in the dirt.

Frog kissing is a good analogy of what I try to do in my work- to help a person bring some understanding and a touch of grace to some aspect their life in order to help them transform it into a more prince or princess like part.

*Do you remember in the fairy tale, how the wicked witches spell
 Changed the handsome prince to a toad?
 Through the power of her potion, she handed him the notion,
 That he was lower than the dirt in the road.
 And though she left him green and warted, her evil plan was thwarted,
 When there chanced to happen by a young miss.
 Who in spite of his complexion, offered her affection,
 And broke the wicked curse with her kiss.*

*Once upon a time ago, I was down and feelin' low,
 Like a lonely frog in a pond.
 Life was just a joke, and I was very near a croakin',
 I was zapped by life's wicked wand.
 Then in the depth of my depression, there came a true expression,
 Of a love from a lady so sweet.
 She gave me warm fuzzy feelin's, feelin's that were healin',
 And knocked me off my little web feet.*

*There's a happy ever after land, deep in the heart of man,
 Where a prince or princess abide.
 But all we get are glimpses, of the handsome prince and princess,
 Cause they're covered by a green, warty hide.
 And though they are full of life's potential, they're lackin' one essential
 To enable them to shine like a star.
 And that's to have some guy or misses, smother them with kisses,
 And love 'em while they're just like they are.*

*Well if you've never been a frog kissin'
 Then you don't know what you've been missin',
 There's a world of opportunity under each and every log.
 If you've never been a charm breaker,
 If you've never been a handsome prince or beautiful princess maker,
 Just slow down, turn around, bend down
 And kiss you a frog."*

I thank you for letting me share with you about one of my favorite things. And in the words of an old frog kisser-

HOPPY NEW YEAR!

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