

CREATOR

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A TALE OF WONDER & PRAISE

*Sing to the LORD a new song;
sing to the LORD, all the earth (Psalm 96:1).*

The stage is now set for the theater of God's glory. Evening light changes slowly from amber to violet as a curtain of heavy, moist air draws open to the sound of other-worldly worship. Tonight's performers are amphibians of all kinds—sleek treefrogs, big fat toads, aquatic leopard frogs, and the ground-loving spadefoot. Their strange, sweet music echoes amid the audience of nearby trees and shrubs. Maybe angels comprehend their verse but human ears cannot decipher the words of these sacred tunes. Yet we are drawn to them. Most of creation lies in hushed silence as eerie hymns fill the night air. The spring world resonates with the chorus of frogs and toads urging us to adore our Creator!

Though some frogs do not sing, most possess a repertoire of one or more unique melodies. So distinct is an anuran's¹ vocalizations, that a species can usually be identified by the music it performs.

And we can learn a valuable lesson from

the tiny singing frogs of this world. Have you ever wondered how something so small could be so loud? Part of the reason for the frog's success in wetland worship is the way that Christ Jesus designed him. (It's the male frog, not the female frog, that sings.) An individual male's call is formed when air passes back and forth from its lungs to the throat and over his vibrating vocal cords, producing the rhythmic melodies common to ponds and lakes. In addition, these cold-blooded² altos and baritones use their vocal sacs to project their calls throughout creation in the same way megaphones were once used at sporting events. The songs of some frogs are so loud that they can be heard a mile (1.6 kilometers) away.

But the most startling aspect of anuran music is the extreme effort expended by the frog who produces it—this is no wimpy worship! The singing male is greatly exercised



¹ "Anuran" is the scientific term for a frog or a toad.

² The scientific term for a cold-blooded animal is "ectotherm."

Jesus equipped treefrogs with slender bodies, long legs, and large, sticky toepads for life in trees. They eat mosquitoes, ants, and gnats . . . you gotta love 'em!



TREEFROG
(*Hyla* sp.)



TRUE FROGS
(*Rana* sp.)

True frogs are powerful jumpers because their Creator supplied them with long muscular legs and quick reflexes. They usually live in or near water.

Frogs

Many frogs have relatively short bodies, muscular legs, bulging eyes, webbed feet, and they lack a tail (an- “without” + oura “tail”).

A frog or toad species can usually be identified by the “hymns” that males sing.

The name “frog” comes from the Old English word “frogga.”

Treefrog—2011 © Eric Isselée
True frog—Lawrence Whittemore.flickr
True toad—2011 © Lori N Skeen
Spadefoot toad—2005 © Kevin Ross
Narrowmouth toad—2011 © Liz Roy

**THE AMPHIBIANS
CHRIST JESUS
JOYFULLY MADE**

God saw all that He had made, and it was very good (Genesis 1:31).

TRUE TOADS
(*Bufo* sp.)

Jesus gave toads a rather “plump” build. Their skin is dry and covered by numerous glands or “warts.” They also have short legs, so they hop slowly along the ground.



Toads

Toads are ground-dwellers—the most terrestrial of amphibians.

Some female toads lay up to 20,000 eggs at a time, in long strings.

Amphibians are placed into three orders:

- 1) Anura (frogs & toads)*
- 2) Urodela (salamanders & newts)
- 3) Apoda (caecilians)

Our Creator is inventive and fascinating—He never ceases to amaze!

* Almost 90% of amphibian species are frogs & toads.

SPADEFOOT TOAD (*Scaphiopus* sp.)



God placed many spadefoot toads in the middle of the desert. Some spend 10 months underground to escape heat and drought. When it rains, hundreds of toads may suddenly appear “out of nowhere.”



Narrowmouth toads live in the Eastern U.S. Their diet consists mostly of ants and termites.

NARROWMOUTH TOAD
(*Gastrophryne* sp.)



as it calls out. Just how much energy does he exert? One group of experts on frog communication has concluded that “in some species of frogs, calling causes the frog’s metabolic rate to increase ten to twenty times more than its resting rate.”³ That’s equal to the energy output of a world-class marathon runner! How do *your* efforts in worship compare to this?

“Love the LORD your God with . . .
all your strength” (Deuteronomy 6:5)

TWO LIVES

It may be inaccurate to say that our Lord Jesus has a child-like heart (thus bringing Him down from His majesty on High—John 8:23). But He often grants children a joyful, Christ-like interest in His handiwork (Psalm 104:31). What adventurous youngster hasn’t experienced the thrill of hunting frogs and salamanders, wonderful creatures fashioned by our God?

The science of amphibians is called herpetology⁴ (Greek for “the study of creeping animals”). The word “amphibian” comes from two Greek words, which simply translated means “having two lives.” Most amphibians start their existence as tadpoles submerged in water like fish, but eventually they move to land.

An amphibian is a vertebrate that differs from other vertebrates (fish, reptiles, birds,

and mammals)⁵ in some key ways: 1) The skin of frogs and salamanders is generally smooth and moist. 2) Amphibians have “simple” lungs and a three-chambered heart. (Fish have a two-chambered heart; reptiles, birds, and mammals have a four-chambered heart.) 3) But the thing that distinguishes them most from other vertebrates is that amphibians usually transform or metamorphose from an aquatic creature into a vastly-different land animal.

A Short Course in Greek

Many of the terms used in science and medicine come from ancient *Greek words*:

amphibian—a creature with two kinds of life

amphi- = “of both kinds”

anura (frogs or toads)—don’t have tails

an- “without” + **oura** “tail”

ectotherm—a cold-blooded creature that depends upon the Sun’s heat

ecto- = “outside” + **thérme** = “heat”

herpetology—the study of amphibians

herpeton = “creeping animal”

logia = “the study of”

tympanum—eardrum

týmpanon = “drum”

This dual existence plays out most clearly in frogs and toads. A frog begins life as an egg deposited in water by its mother. From the egg hatches a tiny tadpole or “pollywog.” Frogs remain in this tadpole stage for weeks, months, and sometimes years depending upon the species.

Incidentally, the difference between frogs and toads is not very scientific. Toads are technically frogs, but not all frogs are toads. Frogs have moist (sometimes slimy), smooth

³ Elliott, Lang; Gerhardt, Carl; and Davidson, Carlos, *The Frogs and Toads of North America*, (Houghton Mifflin Harcourt: Boston, 2009), p. 26.

⁴ Herpetologists also study reptiles.

⁵ A vertebrate is an animal with a backbone and a bony skeleton.

skin and “leap” when they move; toads have dry, warty skin and take short “hops” as they travel. That’s the main difference between them.

A TOXIC WITNESS

If “beauty is deadly,” then God is the most dangerous being in the universe (Psalm 29:2). And surely amphibians reflect this truth as clearly as any of His creatures here on Earth. Hidden beneath the underbrush of Central and South American jungles, our Lord Jesus has scattered more than 100 species of dendrobatid frogs, known to natives as “okopipi.” They’re commonly called “poison-dart frogs” because Indians of western Columbia apply their skin toxins to the sharp tips of blow-gun darts while hunting game.

Christ Jesus laced the skin of these frogs with alkaloid poisons—chemicals obtained from the insects they eat. These are some of the most deadly, naturally-occurring substances on Earth. One species of dendrobatid, *Phyllobates terribilis*, is so toxic that anyone handling it with bare hands



Christ's holy character is reflected in the Golden Poison Frog.

places themselves in peril. Enough poison permeates the skin of this tiny frog to kill 20 people or two African bull elephants!

Incredibly, the skin of a frog from Ecuador

was found to contain 80 different toxins, one of which—epibatidine—has a pain-relieving property 200 times more potent than morphine.

Not all okopipi are deadly; some possess little or no toxin. God usually dresses these innocuous frogs in drab shades of brown. It is thus God’s incomparable compassion on display when Jesus paints poisonous species with bright, vibrant colors—they are a merciful warning to would-be predators: “Handle carelessly and die!” (Leviticus 10:1-4).⁶

But dendrobatids proclaim more than our Creator’s holy beauty. Males of the poison-dart family routinely guard the eggs laid by mother frogs. And the females of several species carry young tadpoles around on their backs. Oh, the kindness, protection, and parental care that God faithfully weaves into His creation!

We also find in these conspicuous creatures a subtle encouragement for Christians to boldly proclaim the Gospel from the rooftops (Matthew 10:27). Dendrobatids move freely about in broad daylight displaying the glories of God, a diurnal⁷ behavior rare to frogs. (Most amphibians are nocturnal—they’re active at night.) Poison dart frogs are perfectly protected by their Creator. Do we have such confidence when proclaiming the glory of Christ (1 John 4:4)?

PROTECTING HIS CREATURES

A number of things enjoy eating frogs and salamanders—herons, bats, tarantulas, turtles, snakes, large fish, and sometimes even people. Creator Jesus has given amphibians several strategies to avoid predators:

- A treefrog can change colors.
- Many frogs play dead when threatened.
- Some toads inflate their bodies when snakes are nearby (makes them hard to swallow).
- Christ gave all amphibians toxic skin.

⁶ The scientific term for God's use of “warning coloration” in poisonous animals is known as “aposematism.”

⁷ “Diurnal” means “daytime.” A diurnal animal is one that moves about during the day.

- As we noted above, many amphibians make excellent parents, reflecting the character of Christ’s Father. One type of aquatic salamander—the amphiuma—curls around her eggs, protecting them a full five months until they hatch. The males of two Chilean frog species gather all the hatched tadpoles into their mouths, where they remain safe and sound until they transform into frogs.

“The LORD is good to all; He has compassion on all He has made” (Psalm 145:9)

AMAZING SKIN

Frogs and salamanders lack scales, fur, and feathers, but God has given them many other blessings (James 1:17). Amphibians secrete antibiotics from their skin—this helps prevent infections since they’re wet much of the time. Toads are covered in “warts,” which are actually glands containing poisonous chemicals called bufotoxins. If a dog tries to snack on a toad it will experience a severe stomachache. It’s not dangerous to handle toads (you won’t get warts), but it’s best to wash your hands afterward. The skin of all amphibians—frogs, salamanders, caecilians—is mildly to extremely toxic, depending on the species.

Amphibian skin is also highly permeable. When submerged in water, frogs drink in moisture through their skin. Amphibians can also breathe this way. This is especially important to salamanders because many have no lungs. Amphibian skin must remain moist, however, in order to absorb the oxygen and water it needs. So, Jesus supplied anurans and urodeles with mucous glands—this is why some frogs and salamanders feel wet and “slimy.”

A CHANGING DIET

Tadpoles are vegetarians and eat primarily pond scum. When they “grow up” all that changes. Adult amphibians are carnivores and prefer insects, spiders, and worms.

Most frogs have tiny teeth, but usually swallow their food whole. Toads lack teeth yet have no problem catching a meal. Jesus equipped anurans with lightning-fast, long, sticky tongues that they use to capture prey.



The largest toad on Earth, the cane toad (*Bufo marinus*), is an “eating machine,” weighing in at almost six pounds (2.7 kg). It consumes mice, rats, frogs, small birds, and just about anything alive that will fit into its mouth. On the other hand, the narrowmouth toad of North America is a very picky eater. It dines solely on ants and termites.

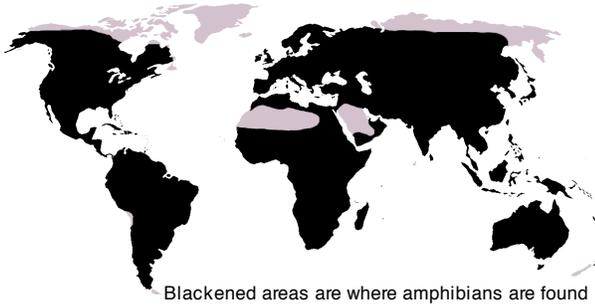
FROGS, FROGS EVERYWHERE

Our Creator, Christ Jesus, shows His genius to the world through the countless ecosystems He has fashioned and the way He has carefully fitted amphibians into each. Some amphibians live in trees, some underground, but many are truly amphibious—spending part of their time in water, part on land.

A few of these environments prove



extreme. There are frogs that thrive in brackish marshes and highly-acidic bogs. The red-spotted toad can survive the blistering heat of Death Valley, California. And God has placed in the Himalayas a green toad that endures altitudes as high as 15,000 feet (4,600 meters). Antarctica is the only continent, in fact, where frogs and salamanders cannot be found.⁸



Blackened areas are where amphibians are found

God could have limited the number of amphibians He made—keeping the variety of habitats that He had to work with to a minimum. But our Lord Jesus delights in showing us just how creative and sustaining He is. He has designed almost 7,000 amphibians—constructing homes (ecosystems) for nearly six thousand species of frogs and toads,⁹ over 600 kinds of salamanders, and 186 types of caecilians. And He did all this with ease (Jeremiah 32:17).

Christ sovereignly made each species uniquely dependent upon the habitat into which He placed it. He specially designed some of His best singers and praisers—the treefrogs—with sticky toe pads and light-weight bodies, allowing them to worship in trees, high above the rest of creation. He supplied the spadefoot toad with unique hind legs for digging in the sand or dirt. And Jesus gave many amphibians webbed feet for swimming.¹⁰

God provides unique care for populations of wood frogs (*Rana sylvatica*) living as far north as

the Arctic Circle. These anurans survive winter by freezing solid. Many other frogs and toads hibernate in winter as well, and some burrow into mud (estivate) when the summer is hot and dry.

AMPHIBIAN SENSES

Two of the most noticeable things about frogs and toads are the bulging eyes on top of their heads. Many amphibians have tiny eyes, but not frogs. Sneaking up on a frog is difficult because it can look in all directions. It should be noted, however, that anurans are generally far-sighted. This means that they see bugs clearly at a distance, but as those tasty, six-legged morsels come near they also become blurry to the frog. Frogs apparently rely more on smell and hearing when prey are close by.

God never wastes energy or effort in His creation, and He often employs one part to help another. Such is the case with frog and toad eyes and the act of swallowing. As a frog swallows a meal, it pushes its eyeballs back into its head until they bulge from the roof of the mouth. Believe it or not, its peepers help force food down its throat! What a strange and wonderful use for eyes.

Amphibians don't have ears like you and I. Salamanders, for instance, lack visible ears altogether and sense ground vibrations through the bones of their body. On the other hand, our



American bullfrog
Rana catesbeiana

⁸ Many oceanic islands also lack amphibians.

⁹ Frogs & toads are ectotherms—they take on the temperature of their surroundings—so Jesus put most of them in the warm tropics.

¹⁰ SCUBA divers were originally known as “frog men” because the flippers they used were patterned after the webbed hind feet of a frog.

CAECILIAN

(see - SIL - ee - an)



Living underground in the tropics of South America, Africa, and Southeast Asia, caecilians are often mistaken for earthworms. Unlike worms, they have bones, teeth, small eyes, and toxic skin.

OLM

(*Proteus anguinus*)



An olm has a very long body with four legs.

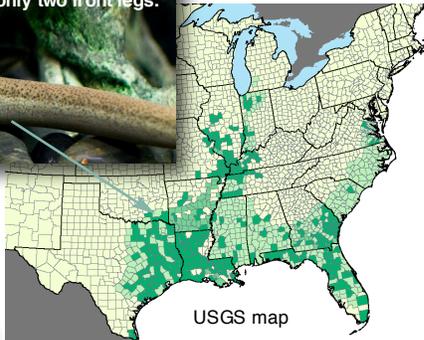


The olm is an eel-like, blind salamander that lives only in limestone caves of Eastern Europe.

Sirens are found in the Southeastern U.S. & can live 15 years.



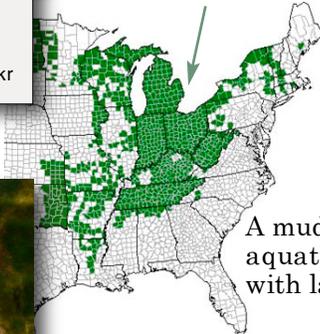
Sirens have gills, a long body, and only two front legs.



SIREN
(*Siren sp.*)

- Caecilian—Milvus/Wikimedia
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- Mudpuppy—mcwetboy/flickr
- Olm—AJ Cann/flickr
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Where mudpuppies live



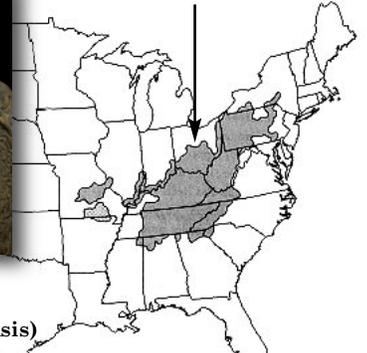
MUDPUPPY



red gills

A mudpuppy is an aquatic salamander with large red gills.

Where hellbenders live



HELLBENDER
(*Cryptobranchus alleganiensis*)

The hellbender is a giant salamander that lives in the cool streams of the Appalachian Mountains.

SALAMANDER



The largest salamanders —up to six feet (1.8 m) & 143 lbs (65 kg)—are found in China & Japan.

Salamanders and newts have long, slender bodies, like lizards, but have no scales. And, unlike frogs, they can't sing because salamanders and newts lack vocal cords.



NEWT

Our Lord Jesus painted many newts in bright colors.

Lord Jesus blessed the anuran with a rather large eardrum or “tympanum” (pronounced TIM - puh - num) on each side of its head. Research has shown that a frog’s ears are especially tuned to the music sung by its own species.

It’s hard to know precisely what other creatures smell, but some amphibians must possess this keen sense (see **CREATOR** 16-1 & 16-2). There is a certain Central American frog of the genus *Rhinophrynus*, for instance, that can locate termites underground by detecting the odor that the insects produce.

WILL THE MUSIC STOP?

Aside from predators, amphibians face a number of dangers that have wiped out whole populations of frogs and salamanders:

- Their habitats are being destroyed, especially in the tropics.
- Chemical toxins are concentrating in many environments.
- In 1998, a microorganism—the chytrid fungus—was discovered to be spreading among many amphibian species, killing off wild populations.
- Frogs are also prone to deformities. It’s now known that a parasite—the pond fluke—is responsible for these malformations.

We should do everything in the will of God to preserve His tiny, delightful musicians. But let’s also look forward to the day Jesus establishes a new Earth (2 Peter 3:13), a world that will never succumb to extinction.

TRANSFORMED BY CHRIST

In a way, sin is like the above-mentioned pond fluke—wickedness acts as a parasite in our lives, deforming us to its will (Romans 7:23). But if we hope to be with Jesus in Heaven when we die, we must realize that we cannot enter misshapen by our sin. God will accept into His presence only those who are

perfect (Matthew 5:48). We must, like Paul, see the effect of evil in our lives (Romans 7:24) before it’s too late, otherwise we will never be cured on our own:

*The heart is deceitful above all things
and beyond cure (Jeremiah 17:9).*

Christ Jesus died on a cross to absorb the wrath of His Father’s infinite anger against our sin—Jesus took on the sins of His people, enduring the punishment we deserve (Romans 6:23). Those who reject this flawless truth will forever be separated from the mercy of God found in Christ (Matthew 13:41 NKJV).

But if you look to Jesus with the eyes of faith (Ephesians 1:18; Hebrews 12:2), you will join the rest of God’s creation in worshiping Christ and enjoying Him forever.

Some wonder what we will appear like in eternity. We can’t be certain (1 John 3:2), but those who love God will resemble His Son, Jesus. I suppose that we will be as different from what we are now as a frog is from a tadpole . . . maybe even more. We can be certain of one thing—we will no longer be crippled by sin! So, please put your hope in Christ alone (John 14:6).

*. . . be glad and rejoice forever
in what I will create (Isaiah 65:18a).* □



R.J. DESTREE
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