



# CREATOR

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## GLORIOUS EFFECTS OF GRAVITY

*“He is before all things, and in Him all things hold together” (Colossians 1:17).*

The things of nature come from the winsome thoughts of God (Psalm 92:5). Christ is infinitely greater than anything He has made. Yet Creation is a treasure chest to behold because it sparkles with *the character of the Trinity*, our *True Treasure!* As we explore nature, let’s look deeply into its heart that we may desire our Creator (Psalm 37:4).

The hand of our glorious Heavenly Father is brilliantly displayed in *gravity* as He guides and molds all of Creation. It is the “hoe” God uses to cultivate the garden of His universe. And the wonderful effect gravity has on nature causes the flowers of His Son’s precious character to bloom everywhere. Take away gravity and there would be

no rain, lakes, streams, or oceans; no atmosphere or weather; no Earth, Sun, or stars; and no life. The fruit of Christ’s nature is sweetly revealed through the work of gravity. And if we desire, we can “taste” the wonderful things gravity is telling us about God (1 Peter 2:3).

Everything in the universe—whether living or not—responds in one way or another to this mysterious force. In the box below is a very short list of divine impressions gravity has left upon Creation and the glorious treasures of Jesus it displays; these are common but remarkable results of gravity’s steady pull. Those who venture too close to the edge of a high cliff also come face-to-face with the danger of gravity—a faint whisper (Job 26:14) of *our infinitely dangerous God* (Psalm 2)!

In the end, we will realize that gravity forced the last breath from the lungs of our precious Savior while He hung on a cross (Isaiah 53:5, 10), sealing forever His sacrifice for our sins. Christ’s willing submission to the crushing force of gravity He created led to His death, *richly demonstrating His mercy.*

- rain & snow

- limestone caverns

- waterfalls

- mountains

- weather

- sun & stars

*His Father’s love* (Matthew 5:45)

*hidden treasures of Christ’s splendor* (Habakkuk 3:2-4; Matthew 13:44a)

*Christ’s Spirit, the Joy of our hearts* (Psalm 104:13; Romans 14:17-18)

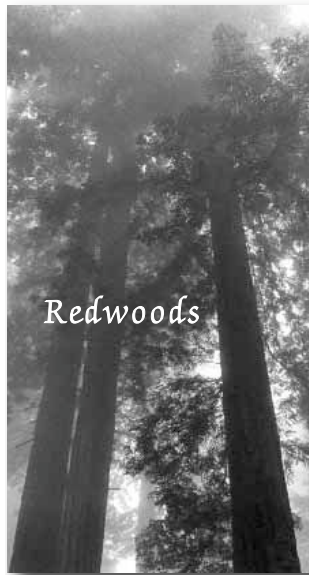
*the praise of God* (Psalm 98:8)

*our great Creator’s wisdom* (Job 38:33-38)

*the fiery holiness of Jesus* (1 Timothy 6:15b-16; Hebrews 12:28-29)

## GIANT TREES

If you want to be stunned and humbled by a *living* demonstration of gravity's glorious effects, plan a trip to a 450-mile strip of redwood forest stretching from northern California to southern Oregon. The *coast redwoods* (*Sequoia sempervirens*) thrive here, standing as a titanic testimony to Jesus' engineering skill.



Have you ever attempted to stack small wooden blocks one on top of the other? Try it sometime. How high can you make a tower of wood before it succumbs to the pull of gravity? A foot, two feet, three feet (one meter)? Now consider this: God our Creator stacks trillions upon trillions of microscopic cells to form trees that stretch over 360 feet (110 meters) in height, making them the largest individual organisms in the world! To survive, each redwood must transport tons of water upward every year—against the pull of gravity—to its leaves 35 stories above ground.<sup>1</sup> The tops of these redwoods loudly proclaim: “***Our God is great! Our God is great!***”

When man builds a really tall building, it shines with a little glory; ***God constructs things with glorious glory*** (1 Peter 1:24-25).

## METEORS

If the redwood forests are too far away, and you're eager to view the creative strokes gravity paints upon the world, then just look up. On a clear night, away from city lights, you can observe a most spectacular sight—the brilliant plunge of meteors to Earth.

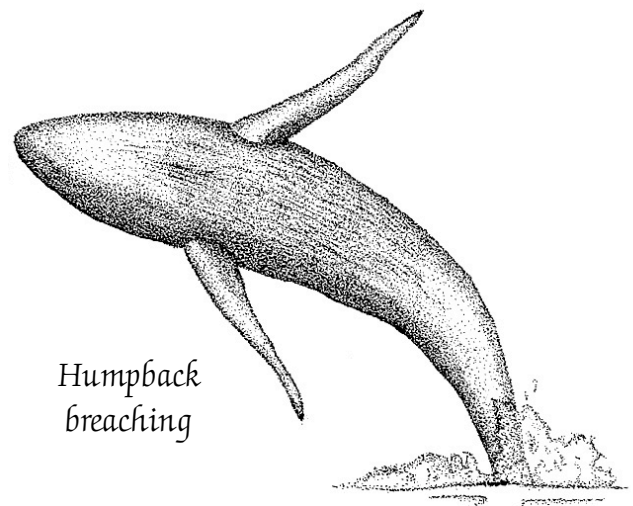
Meteors are relatively small chunks of space rock usually one inch (two centimeters) or less in diameter. Despite their diminutive size, these rocks often leave a streak of light across the sky that can be seen many miles (kilometers) away.

The altitude at which most meteors<sup>2</sup> start to glow is 50 miles (80 kilometers). God uses the force of gravity to hurtle Earthward stones that reach speeds of 15 meters per second (32,000 miles per hour) or more! The ripping and tearing of friction upon a meteor as it whizzes through the upper atmosphere vaporizes the surface of the rock, heating it to 3,600° F (2,000° C). This, in turn, causes it to glow white hot.

Every night a few “shooting stars” can be observed, but several times a year Earth experiences a meteor shower.<sup>3</sup> On these nights, it may be possible to see 30 or more meteors each hour!

## WHALES

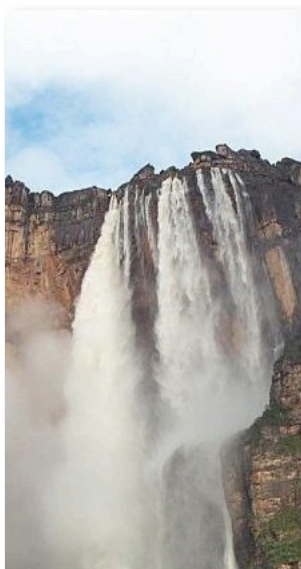
Without the support and buoyancy of seawater, whales would be crushed under their own weight. The blue whale (*Balaenoptera musculus*) can grow to a whopping 120 tons (109 tonnes). Despite their enormous size and weight, some whales are able to propel themselves out of the water. This is especially true of the humpback whale (*Megaptera novaeangliae*), which has come to be known as the “acrobat of the sea.” These



gentle giants generate enough force to lift their 40-ton (36-tonne) body out of the sea. *Oh, what a glorious sight!* There is no good scientific explanation why whales would do this, but I am convinced they proclaim *the joy of the Lord Jesus Christ*, their Creator, as they jump. The gymnastic skills of these behemoths have attracted onlookers from all over the world for decades.

## WATERFALLS

Mighty waterfalls loudly broadcast *the delight of God* using the simple blend of two most-common things—water and gravity—producing a spectacle beyond compare. The most breathtaking of waterfalls resides in Venezuela and is named Angel Falls (Salto Angel in Spanish). At 3,212 feet, it reaches almost one kilometer in height! Tugela Falls of the Tugela River in South Africa owns the title of the second longest waterfall, stretching 3,110 feet (947 meters). Blessed among countries, Norway possesses five of the ten highest waterfalls on Earth!



Angel Falls

There are so many other things that proclaim the glory of God through gravity that we don't have time now to investigate; we have said nothing about the graceful soaring of eagles, the thunder of an avalanche, the fury of hail, or the gentle tumble of an autumn leaf. *Please ponder* these and other wonders in your heart so that you may be encouraged to know better Christ our Creator!

### Footnotes:

1 Gravity prevents redwoods from growing higher than 400 to 425 feet (122 to 130 meters).

2 Space rocks are called *meteoroids*. As a rock or particle of dust enters our atmosphere, it is known as a *meteor*. If a meteor hits the ground, it is labeled a *meteorite*.

3 See *kids' kreation* # 31 (inside *CREATOR* Volume 7 Number 1).

## SENSING GRAVITY

Our Lord Jesus Christ is always concerned about His Creation. He gave all His creatures—from bacteria to people riding on a roller coaster—the ability to detect gravity and maintain balance. How He accomplishes this in each organism varies from species to species. But this reveals Him as the *kind and caring Creator* He is—He doesn't leave us to be “blind explorers” in the expanse of Creation. We cannot see gravity with our eyes, but we know it's there!

## GRAVITROPISM<sup>4</sup>

It does not matter how you plant a seed—right side up or upside down—God will make it grow correctly. All the living things that Jesus made respond to gravity. From microbes to whales, seeds to redwood trees, all life “obeys” the laws of gravity. But how do organisms detect this unseen, mysterious force? What means did Christ give plants and animals to safely maneuver in Earth's gravitational field?

I'm sure you've noticed that the roots of plants grow down and that their stems or trunks grow up. This may not be important to us but it's a big deal to vegetation—this pattern of growth is crucial for their survival. If a tree's roots grew up, not down, the tree would soon die from lack of moisture and minerals. Our Lord Jesus wisely constructed plants capable of telling which way gravity is tugging.

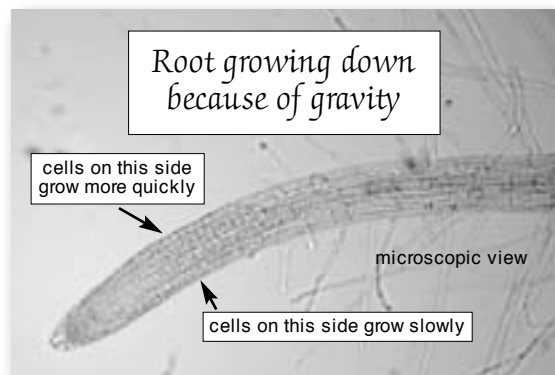
The tiny roots and shoots of sprouting seeds possess cells at their tips that contain special *grains of starch*<sup>5</sup> that respond to the Earth's gravitational pull. Botanists (scientists who study plants) believe that it is the movement of these starch grains, in turn, that causes *calcium* to be released by the cells of seedlings, further stimulating the release of *auxin* (AWK - sin), a powerful plant hormone.

4 Pronounced grah - vih - TRO - piz - um.

5 Scientists call these starch grains *amyloplasts* (AM - uh - low - plast).



If you turn a potted plant sideways, the roots and stem will begin to grow in a new direction 15 to 30 minutes after being rotated. Auxin concentrates on the lower edge of the roots. This then causes the cells on that side to grow more



slowly than the cells on the top side of the roots. The result is that the roots change direction and move downward. The exact opposite is true for the growing shoots—auxin is released in response to gravity, causing the shoot to grow upward and away from its relentless pull.

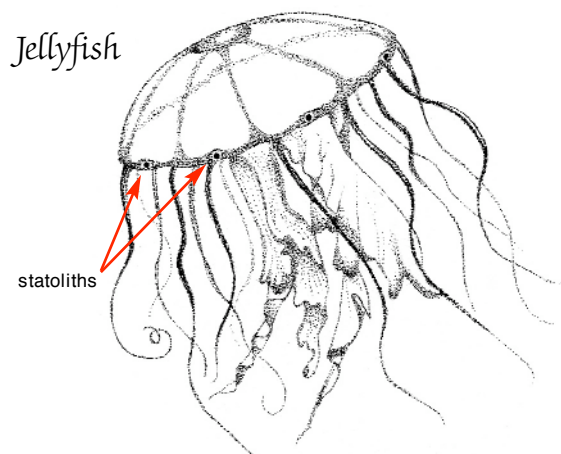
A plant's ability to respond in this way to gravity is called **gravitropism** (also known by the older term geotropism). The growth of roots is said to be an example of **positive gravitropism** because roots *move in the direction of* gravity. Shoots display **negative gravitropism** because they *grow away from* the pull of gravity.

## ANIMAL SENSE

A plant's ability to detect the force of gravity is wonderful. Yet Jesus' creation of animals is even more fantastic because animals require balance and agility as they move about. If only we understood how difficult it is to create a bird or a bat or an insect capable of flying—knowing that for God this was easy—I think we might fall to our knees in the worship of our Creator every time we saw a dragonfly or a sparrow!

In addition, the larger an animal, it seems, the more complex is its ability to respond to gravity and the more glorious is Christ's design. In this sense, a giraffe displays more glory than a rabbit; an eagle is more majestic than a fly. But the "simpler" creatures proclaim God's glory well enough. Even a microbe—as tiny as it is—can feel the pull of Earth.

Christ Jesus sewed several tiny "stones" or **statoliths** into the outer bell of a jellyfish so it "knows" when it's swimming up, down, or sideways. These minute statoliths move in response to gravity as the jellyfish performs its rhythmic, aquatic dance. Many invertebrates possess similar means to measure the force of gravity.

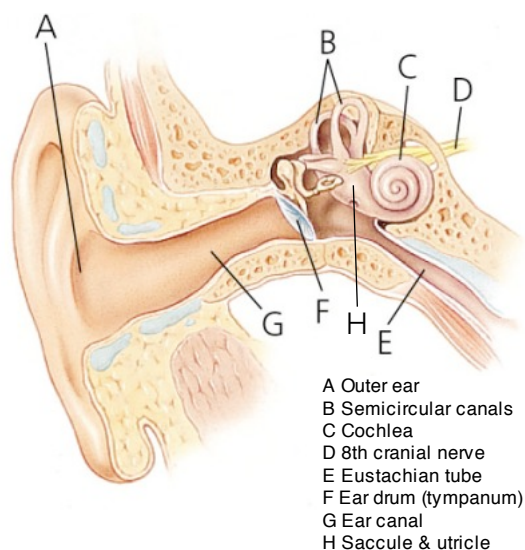


Inside the inner ears of vertebrates<sup>6</sup> is a group of tiny sensory organs that help form the **vestibular** (pronounced veh - STIB - yoo - lawr) **system**. These organs detect the pull of gravity and other accelerating forces experienced when an animal or a person walks, runs, jumps, or flies. Without Christ's invention of the **vestibular system**, dogs could not chase cats, birds would be grounded, fish could not swim, and people would not be able to stand upright, let alone participate in sports! Remarkably, this same vestibular system is found in the octopus (an invertebrate)—an animal quite **different** from a dog or a bird—hinting that our Three-in-One God is **the same** in thought and purpose. He is the One Creator of all people and octopi!<sup>7</sup>

<sup>6</sup> Vertebrates are animals with bones: mammals, birds, reptiles, amphibians, and fish. Invertebrates have no bones.

<sup>7</sup> This is a reflection of what theologians call the **unity in diversity** and the **diversity in unity** of **the Trinity**.





## PEOPLE

For humans, the control center for balance and equilibrium is primarily located in the inner ear, brainstem, and cerebellum (our vestibular system). Our ears are divided into outer, middle, and inner compartments.<sup>8</sup> The inner ear is where the cochlea (COKE - lee - ah) is located, which turns sound waves into nerve signals that go to the brain. Right next to the cochlea are found the semicircular canals, the utricle (YOO - trih - kal) and the saccule (SACK - yule).

The **semicircular canals** (SCC) are three amazing, interconnected loops precisely positioned by God and nearly perpendicular to each other. In this way, the SCC can detect **angular acceleration**—the movement of our head as it rotates in any direction. There is a thick liquid inside our SCC that starts circulating when we rotate. It is this movement of fluid that tells our brain we are spinning.

The second group of vestibular organs of our inner ear consists of the **saccul**e and the **utricle**. These are essentially little bags filled with fluid and hundreds of thousands of microscopic calcium carbonate stones ( $\text{CaCO}_3$ ). Whenever we

experience **linear acceleration**—acceleration caused by gravity<sup>9</sup> or the speeding up of a car for instance—these ultra-tiny stones (otoliths) inside the saccules and utricles press down on microscopic nerve hairs, giving us a sense of movement.

The complexity of the vestibular system is beyond our wildest imaginations. It is this system that allows a child to keep his balance as he rides a bicycle and prevents a toddler from tumbling to the ground every time she runs (which sometimes happens because her nervous system and muscles are still developing). The vestibular system makes a supercomputer look like a simple calculator and reveals Christ to be the **Genius beyond all geniuses**.

Our sense of balance is tied to our eyes, and this can be a blessing and a curse. Eyesight allows us to better maintain our balance, but is also why so many people experience motion sickness. In an automobile or an airplane, our vestibular system detects movement that is not always precisely coordinated with our vision. One way to reduce motion sickness is by keeping your eyes fixed on the distant horizon as you look out the window of a car or plane.

Animals and plants are employed in a lifetime of glorious labor—God-ordained work to display His divine majesty. When a tree stretches its branches to the sky or an animal jumps for joy,<sup>10</sup> it cultivates a rich harvest of worship in the field of gravity for those who have eyes to see!

## SKATERS AND SEMICIRCULAR CANALS

When our semicircular canals are stimulated, we know we are rotating even without looking. If we rotate more than a few seconds, we can become dizzy and experience nausea. Most figure skaters (90 percent) spin in a counterclockwise direction because they suffer less dizziness this way. But some left-handed skaters rotate clockwise during their spins.

<sup>8</sup> See **CREATOR** Volume 7 Number 3.

<sup>9</sup> Read more about gravity in **CREATOR** Volume 13 Number 3.

<sup>10</sup> Read about the joy of the Lord revealed in animals:

**CREATOR** Volume 11 Number 2.

# THE GRAVITY OF CHRIST'S KINDNESS

*"the sufferings of Christ and the glories to follow"*  
1 Peter 1:11b NASB

We see the glory of our Lord Jesus vividly displayed as a salmon swims with unrivaled balance up and over rushing rapids in a race to bring new life into the world. The fish strains with all its might and with great agility against the river of gravity's pull.

So also, outstretched tree limbs proclaim the external or visible glory of God revealed in Creation (Isaiah 6:3) under the influence of gravity. Without gravity, trees would be a hopelessly tangled mass of trunk, roots, and branches.

Yet it is Jesus our Creator and Savior Who shines the unseen glory of God most clearly and beautifully to the human heart! Upon the Cross, gravity squeezed the life breath out of the Messiah. This seems a horrible thought—to suffocate to death—and it is! But it is also a beautiful truth and **good news**. God had become a baby in Bethlehem, lived as a man, taught us about His Father, suffered cruel torture at the hands of His countrymen, and finally succumbed to death on a tree (1 Peter 2:24). Why?

**God is exalted above the heavens** (Psalm 113:4). All our sins—every hateful or perverse thought we've ever had, every mean and selfish thing we've ever done—damn or condemn us forever before such a glorious Being as God. As God, Jesus humbled Himself to take on human flesh and suffer the infinite punishment (Isaiah 53:4-6, 10-11) we should have suffered for our own wickedness (and will still suffer in hell if we don't love Christ).

Christ died for the sins of His people. And He rose from death to offer eternal life to those who love His Father. Do you desire to walk away from your wicked life and love God forever? If so, His Spirit will show you the way.

"Oh, Father in Heaven, I confess that I have lived

my life in rebellion against You, and this is sin. Please forgive me through Your Son, Jesus Christ—through His death on the cross. Jesus, please come into my heart right now. I embrace You as my all-powerful God, my sweet Savior, and my Eternal Life. Show me how to live the way You want me to live, and allow me to see and hear Your praises throughout the universe! In Your name, Lord Jesus Christ, I pray. Amen."



## THE ONE WHO STANDS ABOVE GRAVITY (Mark 6:47-51)

As Jesus walks on the surface of the lake, the glory of His Being transcends the physical force of gravity that holds the rest of us to the confines of this Earth (and causes us to sink in water). This shows Him to be the Glorious Creator He is! Only God Himself is above all Creation (John 3:31). The magnitude of this biblical account is probably under-appreciated. The One Who wrote the laws of gravity and submitted all of Creation to them, reveals ever-so-briefly to us that He commands all power (Matthew 28: 18; 1 Peter 3:22). Oh, what a God we have in Jesus!



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