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AWESOME SCIENCE

EXPLORE

John Day Fossil Beds

with Noah Justice

Study Guide

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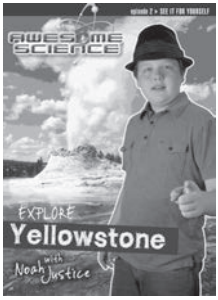

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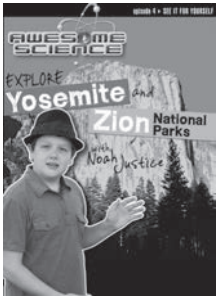

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with Noah Justice

STUDY GUIDE & WORKBOOK

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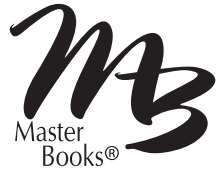

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Introduction

Very few places in America have such amazing sites for exploring volcanic history as the Pacific Northwest. Dormant, extinct, or active volcanoes hold spectacular views. Before these volcanoes rose, a foundation of basalt was laid across vast areas of Oregon and Washington called the "Columbia River Basalt."

Up to 15,000 feet thick, the layers are best seen in eastern Oregon, where they have been cut by extensive erosion. Below and above the basalts are amazing layers of ash, sediment, and fossils. This area was so specular the government declared it a national monument, now known as the John Day Fossil Beds.

Secular scientists say the thousands of feet of basalt and ash layers, along with the erosion which carved them out, took many millions of years to form. As we look at the evidence, another explanation is possible — they were laid down and carved quickly as a result of the global Flood.

Which view is right? What really happened here? All this and more with Awesome Science!

Bonus Activity:

Research John Day — the man for whom this national park is named. See if you can locate on a map any other places that are named for him.

Complete Word List

accumulation
algae
amphitheater
basalt
basin
bedrock
breached
carnivores
chisel
creationist
creodonts
cretaceous
crocodilians
decaying
decomposed
diatoms
dingoes
dormant
eocene
erosion
evolutionist
excavation
extinct
fissures
floodplain
formation
fossils
genome
glacial
granite
gravel
intermixing
lahar
limestone
magma
mainland
mammal
marine
miocene
mudflow
mutations
observable
organisms
paleontologists
palisades
pediment
permineralized
petrified
pillowing
planed
plateaus
plates
pliocene
postulated
quartzite
receding
sandstone
savannas
sediment
shale
shists
slurries
species
strata
tectonic
temperate
tephra
timescale
tortoises
variation
vegetation
worldview

Key Concepts

biblical
biological
cataclysm
conglomerate
deposition
environments
evidence
fossilized
geomorphology
genealogies
geologic
genetic
humanism
interpretive
paleontology
recessional
sedimentation

About John Day Fossil Beds

Fill in the blanks with words from the following list:

expedition	monument	plants	Coastline
fossils	volcanic	John Day	lava flows
Oregon	fissures	basalt	
three thousands			

The state of _____ is divided into four major areas.

The landscape includes pristine _____, rich valleys, cascade mountains, and the high desert located to the east. Much of the high desert is covered in _____ that is thousands of feet thick.

The basalt comes from a series of lava flows originating from numerous _____ in southeastern Washington and northeastern Oregon.

Some of these _____ traveled as far as the Pacific Ocean, located a few hundred miles to the west.

Some of the basalt has been removed, creating large open areas _____ of feet deep, revealing underlying layers of sandstones, shales, and _____ deposits.

These sedimentary beds have colorful shades of tan, green, and red. They often contain _____, mostly of _____, but a few animals as well.

Some of the most specular sites where this sediment has been exposed were set aside for the national _____. Spread over _____ different locations, over 100,000 visitors come every year to experience the outstanding geology and scenery.

This part of Oregon was named after John Day, a hunter and trapper who came west on an _____ party in 1812. He and a partner became separated from their group and were raided by Indians.

This happened where the _____ River enters the Columbia. The river meanders through eastern Oregon and the region.

The monument was established in 1975 and encompasses about 14,000 acres.

It is easy to make your way around the monument on highways and gravel roads. If you're passing through this area, it's really worth a visit.

The Two Models

As one tours around the monument, all of the interpretive signs explain the area's history from a secular, evolutionary perspective.

To many, the word "evolution" means our world has come about by natural processes through long ages of geological and biological evolution. This religious worldview says that every living thing came about by chance from a single cell, billions of years ago.

- This idea combines biological evolution and chemical evolution, trusting by faith that chemicals on the

early earth formed living organisms that were able to reproduce and change into more and more complex organisms. It is the unifying religious theme for the secular worldview in biology and paleontology, and is connected to most of the other sciences as well.

- This worldview assumes that life spontaneously arose from non-living matter, and that mutations and natural selection drive evolution toward increasing fitness and complexity. However, none of this would be possible without a prior event — the big bang. So something popped into existence from nothing and eventually formed stars . . . and squirrels. These are all important aspects of the religion of secular humanism, which dominates society and science today. This religious worldview sets man as the ultimate authority and denies the existence of God.

The correct worldview to examine these amazing features through is special creation and global destruction by a Flood, as presented in the Bible.

- This view starts with the Bible which is 100 percent accurate and places God and His Word as the authority, not man's opinions and ideas. From a biblical worldview, we live on a planet close to 6,000 years old based on the genealogies in the Bible.

Discussion Questions:

1. Which view do you personally feel is right? Why do you feel that is the best perspective to explain these landscapes?

2. God is a God of order and He has created the universe to operate on orderly principles. Look up the

definition of scientific laws — can you see how God's orderly creation is revealed?

3. What is the difference in observable science and historical science? How does the Bible provide a record for creation?

The Starting Point Matters

The best way to approach science is by recognizing that the very basis for even being able to understand the world is found in Scripture. If the world evolved from random processes, why should we trust that an experiment done today should produce the same results tomorrow?

From this starting point, we can use the scientific methodology of careful observations through testing and repeated experimentation to understand the world around us. It's this "operational" science which advances our knowledge and allows us to create wonderful new inventions.

But let's look at the big picture of science laws and theories for a moment. Because neither evolution nor special creation can be repeated in the lab by experiments, they cannot be considered scientific theories. They fall in the realm of history.

Some call this "historical" science, where we use some present-day operational science to try to reconstruct and figure out what happened in the past. This is nowhere near as reliable as operational science, so we have to be clear about what type of science we are talking about.

When we start with the biblical record of a special creation, the Fall, and a Flood, the observable evidence

is easily explained. Sure, we don't know all of the answers, but as we explore God's world, everything can be understood using the Bible as a framework to look at earth's history.

When we see the John Day Fossil Beds, we understand that there are many indicators that catastrophic processes were involved in forming what we see here today.

Bonus Activity:

Many of the great scientists in the past understood that God upholds the universe in a particular way, making scientific study possible. These scientists had no conflict with their belief in God and the Bible and their study of God's created order. See how scientists like Keppler, Boyle, Mendel, Farady, and Newton have greatly advanced our scientific understanding.

The Formations

Please note if the following statements are true (T) or false (F).

___ As you drive through the large canyons and valleys, it becomes evident that only one geologic formation can be seen in the steep walls.

___ From the top of the canyon to the bottom, there are at least ten formations.

___ The top formation contains sediments and glacial deposits, and the bottom of the canyon contains marble, shists, and limestone.

___ Creationists and evolutionist disagree that these rock layers are real and have distinctions; they agree on the timing of laying down these layers.

___ Secular geologists use this column to describe the long ages of the evolutionary history of the earth. Each layer has a set of index fossils that are used to identify it.

___ For the most part, biblical creationists also use the same column, but they interpret what they see mainly as layers being formed during the Flood in quick succession, not over long ages.

___ Arguably, there is no one location on earth that has the full column stacked one layer on top of the other. Scientists piece it together by comparing multiple locations around the world. Let's learn more about the process of layering.

Fill in the blanks with words from the following list:

thousands	magma	post-flood	pillows
quickness	lava beds	short	during
evolutionary	balance	local	slumping

There is strong evidence that heavy volcanic activity was happening _____ and after the period when the floodwater was moving into the ocean basins as the earth came to a _____ point, so this event could have happened then.

One reason why scientists think the basalt may have been formed after the floodwater moved off the continent is that when magma comes to the surface at the bottom of the ocean, it has a tendency to form _____. Yet most of the basalt here has not done so.

So we can't be absolutely certain, but we still have a pretty narrow window — much less than the millions of years in the _____ view.

The pillowing features seem to be related to the quantity and _____ at which magma exits to the surface.

With the massive quantity of basalt here, we can be fairly certain that the earth was putting out very large amounts of _____ at the end stages of the Flood.

The other challenge with this lava being a _____ deposit is the fact that erosion of this area is so massive. The Flood is the only logical event which could have provided the means to carve the basalt _____ of feet deep.

Yet there just isn't evidence that can be interpreted as a _____ flood event in this part of Oregon.

As you enter the John Day River Valley near the small village of Antelope, it's easy to see the lines of contact between _____. They are straight and level.

This evidence is consistent with a _____ period of time between one flow and the next, and the whole sequence accumulated quickly. There were not hundreds of thousands of years between flows — otherwise, we'd see erosion.

There is also a large amount of sliding and _____ in the layers. So the John Day beds were not thoroughly consolidated when formed, but were still soft or plastic when the bending action happened, then they hardened.

During the Flood, massive tectonic activity was happening below the waters to release the magma and ash.

Conglomerate Layers

When the highway was built along the John Day River, several hillsides were exposed showing conglomerate layers. They are called conglomerate because the layers are full of large and small well-rounded rocks buried in mud and ash.

These conglomerate layers are extensive, spread throughout a very wide area of the fossil beds.

We know from observing water action that rounded rocks come from high water flow. The rocks tumble on one another and get rounded. Eventually they break down into smaller rocks, which also get rounded. The fact that there are small and large rocks means there was a lot of water flowing quickly. If the water flow was slow, then the rounding and breaking down of rocks would not be evident and the layer would mainly be different-shaped rocks with sharper edges.

Because this conglomerate layer is spread out over such a wide area, it would have taken a massive amount of water to move this entire layer across eastern Oregon. The Flood is the only logical way to explain this much power and force in a short period of time.

Below the conglomerate layer are sandstones, shales, and ash deposits. All of these layers are sedimentary — they were deposited in water. Shales are usually formed by sand, pressure, and heat.

The heat fuses the particles of sand and other materials together into shale. There was plenty of heat present below the surface of the Flood waters to help form the shales, along with the volcanic activity to generate the ash layers.

No animals or people, with the exception of those in Noah's ark, could have survived what was happening as the waters covered the entire earth. The destruction was complete, just as God said it would be. This is exactly what we see from the geologic record. The destruction was massive and worldwide.

Discussion Questions:

1. How are conglomerates formed?
2. What evidence in the conglomerate layers and in the remains of volcanic activity point to a catastrophic event?
3. There are a large variety of fossils at the John Day Fossil Beds. The Bible tells us that God sent the Flood to destroy all land-dwelling, air-breathing life, except for Noah, his family, and the animals on the ark. Do the fossils found here support that?

Erosion Of The Formations

Thousands of cubic miles of material have been removed from this area. Where did it go? There's no significant accumulation of sediment anywhere between here and the Pacific Ocean.

Fill in the blanks with words from the following list:

shelves	erosional	movements	gaps
excavation	Pacific Ocean	sheet erosion	properties
ocean basins	canyons	elevation	
Mount St.Helens			

For hundreds of miles up and down this river valley, the _____ of this, the Columbia River Basalt, and other layers has been enormous.

Water erosion has amazing _____ and can cut through just about any substance, even basalt. In 1982 at _____, a mudflow caused by immense amounts of water came out of the crater and carved _____ hundreds of feet thick, including a lava flow thought to be 500 years old.

After day 150 of the Flood, the Bible tells us that the waters were indeed receding. Below the surface, the remaining _____ of continents and changes in _____ were happening.

Mountains were being pushed up, valleys were being formed, and what is now the _____ was sinking lower.

These massive geologic changes started moving the water off the continents and into the _____. During this time, giant _____ was moving sediments off the top layers and dumping them on the continental _____ in the ocean.

As the water decreased, it began to carve canyons and _____ in the mountain chains and plateaus.

It is believed that this massive _____ event was responsible for carving the canyons in the John Day Fossil Beds.

The absence of significant accumulations of erosional debris and sedimentary deposits between here and the ocean suggests that most of the material eroded from these great canyons was dumped into the Pacific Ocean.

The Genesis Flood could provide sufficient water to accomplish this task quickly.

Digging For Fossils

It is important if you are interested in looking for or collecting fossils, that you know you are in an area where that activity is permitted. It is illegal to dig for fossils in some locations — so be sure to do your research first!

In the DVD, Noah Justice spoke of being behind Fossil High School where collecting is permitted. The rock is white volcanic ash, and splitting of the rocks with a rock hammer or a chisel can help to reveal fossils. Most fossils found here are ancient leafs.

What's interesting is that the leaf edges aren't bent or anything, which means they were stripped from their plant and buried in the mud flow in seconds.

This is significant because it shows catastrophe was involved in making this fossil. If this leaf had fallen from a tree and laid on the ground for a while, it would have first withered and the edges would have bent, then it would have eventually decomposed. This leaf didn't even get the chance to wither before it was buried.

1. At the beginning stages of the Flood, the fountains of the great deep were unleashed and it rained for 40 days and nights.
2. Water quickly flooded the earth, wiping out the vegetation quickly, stripping leaves from trees as the waters came.

3. The fountains of the deep also included volcanic activity, which would have spewed ash into the water and dropped quickly as sediments, burying the leaves and other small animals.

What makes it even more remarkable is that these leaf impressions were made by vegetation which existed before the Flood!

Bonus Activity:

What is a "fossil bed"? Are they common or very rare? And why are they so important to helping us learn more about the dinosaurs, plants, animals, or insects buried there and the kinds of events that helped to form the fossil beds?

See if you can find five different kinds of pictures of fossilized leaves?

Have any dinosaurs been found at the John Day Fossil Beds?

The Palisades

Fill in the blanks with words from the following list:

bedding	lahars	avocado	jungle
high desert	secular	leaves	sorted
eruptions	particles	ash	
conglomerates		volcanic mudflow	

The Palisades are composed of _____ with angular rocks and boulders. They are thought by _____ scientists to have formed 44 million years ago in a series of volcanic mudflows called _____.

Some scientists claim that this area was vastly different at one time . . . that this dry _____ used to get 100 inches of rain every year and was surrounded by volcanoes in a near-tropical _____ rain forest.

They say this area was near-tropical rain forest because most of the fossil _____ in the rocks came from a rain forest environment. Similar modern ones are found in Central and South America, southeast Asia, and Africa. These include palm trees and _____.

But strong _____ could be an indication that some of the layers could have been _____ by water, or dropped from the air into the water.

There's no question about these cliffs being formed with water. Secular scientists say it was a _____, but a stronger case is made that these cliffs were made during the Flood.

Ash from these _____ would have generated the air fall _____, which dropped into this formation. Leftover vegetation from the beginning of the Flood would have mixed in with the _____ and created these layers.

Concerning the fossils found in the layers, we can infer from the Bible that before the Flood, the earth was much more temperate and tropical.

The fossils we find here reflect and confirm this, as long as these plants were from the same place and not transported. After all, these fossils are a record of burial, and that does not always mean they were living together. There are few or no places on earth today where such diverse plants grow together, yet it is plausible before the Flood.

Petrified Logs

Please note if the following statements are true (T) or false (F).

___ The Arch Trail works its way up to and along the tall cliffs. Fossils are abundant here. There are even petrified logs in the deposits. Some are horizontal and some are even vertical. The horizontal logs all point in the same basic direction.

___ The petrified logs cannot be explained by a mudflow, but they can be explained in light of a large-scale Flood.

___ We know from places like Mount St. Helens how logs can end up vertical in a formation when the root ball becomes soaked with water and drops to the bottom, then is covered by sediment and fossilized.

___ Based on lab experiments, petrified logs can be formed quickly — it doesn't take millions of years.

___ What's interesting about these two conglomerate layers in the cliffs is that they are separated, probably by an air fall tephra deposit or an ash deposit.

___ It could be that this was not just one deposit, but a series of deposits, enough time for a small ash deposit to be made before the next wave of rocks and mud came through this area.

___ Another indicator that these cliffs are old is the lack of extensive erosion on the cliffs. Erosion can be caused by rain and wind, but also the freezing and thawing seen here every season.

___ The current rate of erosion cannot be determined based on observations. There are large boulders on the ground, but nothing significant to suggest millions of years. The cliffs could have remained steep if long ages had passed.

___ We also know this area regularly experiences small earthquakes, which would also shake loose rocks from the rock face. Over long ages, this cliff would have been shaken apart and eroded.

___ Furthermore, using all of these principles of erosion, based on current rates and conditions, this area is about 1,600 feet above sea level and would have been eroded down to sea level in 12 to 15 million years. So even using the secular time scale, these cliffs could not be 44 million years old.

___ In addition to plant fossils, animal fossils are also found here. These include tiny four-toed horses, huge rhino-like brontotheres, crocodilians, and meat-eating creodonts. In other places around the monument they have also found saber tooth tiger fossils.

___ These animals still live here today, and most of them lived in a tropical environment, just like the plant fossils found here. What we find here is just a remnant of what lived before the Flood.

___ Another piece of evidence, or lack of evidence, that this area was not an ancient forest is the absence of a thick layer of leaves, humus, and debris on the forest floor before the mud flow came.

___ If a jungle-like environment was here, there should be thick layers of fossilized forest. Yet the only evidence used to support the presence of ancient forest is the fossilized flora in the rocks.

___ There is no evidence these fossils plants actually grew here. What we do know is water was involved in bringing them here. A much better model is they were carried in during the Flood, deposited, and then fossilized.

The catastrophic Flood described in the Bible helps us provide a much better explanation of what we see here at the Palisades.

The Painted Hills

One of the most photographed sites in the John Day Fossil Beds is the Painted Hills, close to Mitchel. It's rolling gold- and rust-colored hills are strikingly beautiful.

In the Painted Hills we find leaf impressions of pine, alder, oak, and rose.

Fill in the blanks with words from the following list:

root balls	destruction	floodplain	flora
vegetation	coal	pre-Flood	rainfall
evidence	drying	permineralized	
paleontologists			

Secular_____ suggest that thick forests grew here, mainly of hardwoods. They also say _____ was approximately 40 inches a year.

To explain the formation of the Painted Hills using secular ideas, three different lakes and _____ environments are postulated, with _____ and time gaps in between, over some 40 million years.

This time is needed to allow for the development of the _____, one above the other and sufficient time for erosion and the _____ of the previous environment. Yet there are some major challenges with this idea because the _____ of long ages is not readily apparent.

If a forest grew here, we should see tree limbs and maybe small _____, but none of that is found in these layers. We should even find some _____ from the decaying trees, but none of it is there.

There are black smears in the beds, but they are _____ wood, not significant compared to what is expected from an ancient forest growing here.

We also know that it only rains an average of 14" a year in this region, but the fossil _____ found here grows in a more lush environment. These types of fossils are what we would expect to find from _____ environment.

Fossil Evidence

We find animal fossils, insects, salamanders, small fish, bats, and even bird feathers. If a local flood buried these animals and they fossilized, you would expect to find insects, fish, and salamanders, because they could not escape easily.

On the other hand, flying creatures could have escaped, yet their fossils are also here. A large global-scale flood

event makes more sense of the variety of fossils we see here today.

In addition, the fossilized leaves found here are mostly flat, indicating they were submerged in water and buried quickly before their leaves curled. If several forests lived and died here, then the leaves should have round edges, or should have just totally decayed away.

Because these leaves are buried in sediments and ash, where did the water come from? The closest source is Bridge Creek, which is just a small stream and doesn't provide nearly the amount of water needed to create large amounts of sediment to fossilize a forest. For the amount of destruction seen here at the Painted Hills, it would have required a major catastrophe.

A better explanation is that these leaves were transported in. This fits with a global Flood. The leaves would have been separated from their trunks and limbs in the incoming Floodwaters, and then buried rapidly in the quickly forming sediments and volcanic ash. The animals too would have been swept up in the waters along with the leaves and fossilized quickly.

The evidence here at the Painted Hills is much more consistently explained by Flood model researchers.

Discussion Questions

1. What do the presence of flying creatures in the fossil record at John Day reveal about the scope of this catastrophic event?

2. What clues are found in the preservation of the leaf fossils that also support a quicker event, versus forest activity over millions of years?

The Cretaceous Gable Creek Conglomerate

Please note if the following statements are true (T) or false (F).

___ Along Highway 207 near Wheeler is a fascinating geologic formation in the John Day Fossil Beds, called the Cretaceous Gable Creek Conglomerate, dated around 30 million years old by secular scientists.

___ The problem for creation scientists is that there is about 30 million years missing between the Eocene Clarino Formation, and this one — by their own calculations!

___ Clearly, this wasn't formed over millions of years, but by the Flood over a short period of time.

___ The Gable Creek Conglomerate reveals starling evidence. It was created with catastrophic processes and contains the Hudspeth Marine Sandstone intermixing with the Gable Creek Conglomerates.

___ You can see the direction of flow found in the rocks. One came from the southeast, the other from the northeast.

___ The Hudspeth sandstone contains marine fossils while the Gable Creek Conglomerate contains a variety of rock types, including quartzite and

granite. Layers cover 70 square miles and are 9,000 feet thick in some places. _____

___ Since quartzite mountains occur in Oregon, these rocks would need to have been rolled from somewhere else. The nearest source for those quartzite cobbles is the Rocky Mountains of Idaho and Montana, several hundred miles away.

___ Based on studies by creation scientists, only currents over 50 mph in slurries of over 100 feet deep could have move these rocks.

___ Secular geologists cannot easily explain these amazing geologic features. The Hudspua formation is sandstone and contains marine fossils. This means that these rocks were formed underwater in a large flood event.

All of this is better explained by a global Flood with violent shifting currents under the floodwaters which covered the entire earth. There were violent currents flowing around the globe as huge shifting in the earth's plates was happening below the waters. Massive new sedimentary layers were being made quickly.

Picture Gorge

Please note if the following statements are true (T) or false (F).

___ The Picture Gorge Basalt covers over 10,000 square miles and makes up 2 percent of the total volume of the Columbia River Basalt.

___ These flows most likely came from fissures, or cracks, in the earth's crust, which can be observed down the road from Picture Gorge by Fossil.

___ Secular geologists will often tell you the small John Day River cut this canyon over long ages. Yet with some closer examination of the evidence, this may not be the case.

___ Just the fact that the gorge has near-vertical walls is an indication these steep walls are not so old.

___ If the gorge existed for thousands of years, current rates of erosion would have rounded, and removed much of the material forming this canyon.

___ Water usually finds the lowest point to travel through. After a careful analysis of the geology and landscape, the John Day River should have flowed past this area and through Keyes Creek Pass just to the west, which is about 1,000 feet lower. But it went through this area we now call Picture Gorge.

___ In geomorphology, this feature is called this a "water gap." Many water gaps are seen around the world where water has cut through elevated areas.

___ Some secular scientists say that the land was pushed up after the gap was made. It's pretty easy to see this is not the case.

___ If the ground was pushed up, then you would see broken and cracked layers, which you just don't see. If the ground rose too quickly, it would dam up and go the other way. If the dam broke, you should see evidence of flooding, which you don't see.

Discussion Questions:

1. How are water gaps good indicators of a global Flood? (Hint: mountains in the recessional phases of the Flood and the process of sheet erosion)
2. Explain how it was not the small river which caused the canyon, but the canyon which now makes a path for the river in an event like the great Flood.
3. One of the geologic markers near Picture Gorge says, "The sharp, steep walls of Picture Gorge suggest a sudden cataclysm. . . ." But the sign continues, "and not the slow, relentless forces that actually shaped it." What portion of that sign supports a creationist perspective and which supports a secular perspective?

SHEEP ROCK

As you come out of Picture Gorge, Sheep Rock towers in the middle of the valley. It's an impressive sight because of all the layering seen in this mount several hundred feet high.

Fill in the blanks with words from the following list:

violent	colors	cap	Mascall
formation	localized	sediments	diatoms
disjointed	connected		

The bottom layers are the John Day Formation, mostly made up of ash. The different _____ represent the different stages of the _____. The lower is red, the middle is greenish, and the upper is a buff color.

Secular scientists say the John Day Formation was made 18 to 39 million years ago. But because of the _____ nature of the mammal skeletons and the _____ nature and varying thickness of these beds, slumping and reposition of these sediments has likely occurred underwater. Put simply, the Floodwaters were active and _____ while this layer was being deposited.

What's cool about Sheep Rock is the _____ at the top. After all the ash layering, the top is basalt from the Picture Gorge Basalts.

Sheep Rock used to be _____ to the other formations here in the valley, but the receding Floodwaters carved around it and left it standing alone.

After the massive lava flows covered the John Day Formation _____ of ash were laid down during the late stages of the Flood in the Pliocene-Miocene _____ Formation.

Secular scientists say this layer was laid down 12 to 15 million years ago, but what isn't admitted too often is this layer contains _____, tiny one-celled plants found in oceans.

After the Mascall Formation was laid down, there was some major slumping of the land in this area. Warping brought the whole sequence of beds downward to disappear into the John Day Valley.

Parts of the bent layers were then planed off by the beginning of the receding floodwaters. As the receding floodwaters decreased, more sediments and ash were laid down, which became the Rattlesnake Formation.

Finally, major sedimentation ended and erosion produced by the final stages of deposition by the Genesis Flood waters and Flood and post-Flood volcanic activity actively shaped the dramatic landscape you see. All of these layers are an indication of quick deposition and formation during the Flood.

Discussion Questions

1. The top of the Mascall Formation is smooth. Why does that make it unlikely to have been impacted over millions of years?
2. How does the biblical Flood model explain the presence of diatoms in the Mascall Formation? Why do secular scientists tend to ignore the diatoms?
3. What kinds of fossils are found in Blue Basin?
4. Can you discover why the best time to hike Blue Basin is in the morning or evening? (Hint: see what you can find about weather)

Mammals of John Day Fossil Beds

As you go throughout the John Day Fossil Beds, there are many signs referring to the mammal fossils. In fact, this area is considered one of the largest beds in the world for finding mammal fossils.

Many of these mammals are unusual because we don't see them today, yet most are related to modern, living mammals. A few are extinct and not related to any living mammals.

Please note if the following statements are true (T) or false (F).

___ Among fossils found here are several catlike carnivores, over a dozen different members of the dog family, horses, several different rhinoceroses, and a number of different camels.

___ The visitor center and published materials say these animal fossils evolved from common ancestors, yet most of these mammals fit into the family categories of living mammals.

___ The secular idea of evolution generally says the ancestors of modern animals were "simpler" and the modern more "complex."

___ If true, we should see a chain of animal fossils connecting these links.

___ Yet when we look back through the fossil layers, the earlier mammals are just as complex. Evidence of evolution from simpler animals is abundant.

___ Of course, we expect the complexity of early animals since each kind of animal was made on days 5 and 6, with intricate details by God.

So why don't we see the type of animals today that show up as fossils in the John Day Formation?

During the 1,600 years before the Flood, members of the dog, cat, and camel kinds diversified. But once the Flood came, it wiped out all of the varieties of animal kinds that existed before the Flood which were not aboard the ark.

That's why we don't see many of the varieties we find in the fossil record alive today. For example, two dogs brought onto the ark had enough genetic information

to spread out and become the varieties we have today — from wolves to dingoes to coyotes to domestic dogs.

Time Between Layers?

The lower and upper layers of the John Day Fossil Beds have different types of mammals. Secular scientists talk about millions of years between the layers. They say these layers represent different environments such as rainforests or savannas, and the mammal fossils represent those environments. They use evolution to explain why these mammals are different in each layer.

But the Flood model also explains why we see different mammal fossils in the various layers. The John Day Formation would have been formed before the large basalt layers.

The Flood would have had different currents bringing in the sediments and fossils. After the thousands of feet of basalt was laid down rapidly, the current in the floodwaters could have changed and brought in fossils from a different place, all giving the appearance of different environments growing in the same region and being buried on top of one another.

Everyone is looking at the same evidence. The only evidence scientists have to go on is the layers and fossils in those layers. No one alive today was there to observe what happened.

One view says everything we see lived there over long ages. The other model says most of the fossils were moved in by water in less than a year. Since the Bible is a true history book, we can interpret what we see here at the fossil beds as a result of the global Flood recorded in the Bible.

Discussion Questions:

1. Are animal kinds as noted in the Bible the same thing as species? Can you give an example of an animal kind that has many species.
2. Why don't creationists have a problem with what is known as natural selection?
3. How does a global flood explain the presence of fossils from environments different than that in which they were found?

Bonus Activity:

Research a creationist named Ed Blyth. What idea did he propose that is credited with being discovered by Charles Darwin?

GOOSE ROCK AND PEDIMENTS

Here at Goose Rock, a conglomerate layer has been exposed. Several different types of rocks intermix here, which means a water deposit.

Some of the pebbles and gravel in Goose Rock are thought by secular scientists to have come from the Aldrich Mountains, 40 miles to the south because wash rock is the same at both locations. But there may be another source of these rocks, much farther away.

It's true, these rounded exotic cobbles and boulders are found on the south side of the Aldrich Mountains, but also in the Ochoco Mountains west of here. The Aldrich

Mountains may not be the source of these rocks, but just a depositing point of a much larger transport of stones.

A large concentration of these same type rocks come from the Rockies, several hundred miles away. Secular scientists have a very challenging time explaining how this could have happened.

But as creationists, it isn't that hard when we start from the Bible. Massive amounts of water, such as during the global Flood would have been required to move this rock so great a distance.

Discussion Questions:

1. How do the gravels and pebbles of Goose Rock show the challenges of historical science versus observable science? (Hint: their possible origin)
2. What are pediments — why is their presence near Goose Rock such a mystery?
3. Can pediments be explained by receding floodwaters? If so, how?

JOHN DAY FOSSIL BEDS: CONCLUSION

The John Day Fossil Beds are a testament to the rapid deposition, volcanic activity, and erosion of the earth during the year-long Flood described in the Book of Genesis.

Researchers can recognize that the evidence is a good confirmation of the catastrophic processes that formed

these layers. The lack of erosion between layers, the high-energy deposits, the massive erosion, and no evolutionary links in the fossils . . . all are evidence for the biblical record being true.

What we see here reminds us that there was a judgment for man's rebellion against God as recorded in the Bible. Because of his holiness and justice, God promises a coming judgment for man's continued rebellion after the Flood, and this time a judgment by fire.

Yet God in His love and mercy has provided a way of escape, through repentance of sin and faith in his son, Jesus Christ. By His death on the Cross, Jesus took the punishment for your rebellion.

To be saved, you must repent of your sin and rebellion and turn your heart toward Him in faith. We don't know the day when this next judgment is coming, so turn to God today before it's too late.

Come visit this amazing landscape, and see the evidence of catastrophic process during and after the global Flood. And remember, science, its awesome!

Mount St. Helens showed us on a small scale the catastrophic processes that were at work during and after the Flood 4,300 years ago. Science — it's really awesome!

EXPLORE John Day Fossil Beds

with Noah Justice

Designed to make science fun, the *Awesome Science Series* is an educational and entertaining opportunity for everyone.

Use this study guide for *Episode 6: Explore John Day Fossil Beds* to display the knowledge the student has obtained by watching Noah as he traveled to eastern Oregon and explored this unique national monument. Thousands of feet of Colombia River basalt were exposed by a major erosional event, most likely the global Flood. These fossil beds have the largest collection of mammal fossils found in the world.

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