

VOLCANOES
-
THE FIRES OF CREATION

Final Script
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Narration:
Volcanoes. They erupt with a force that we can't control...

Narration:
...a fire we can't put out.

Narration:
Their mysteries are still being explored.

Narration:
Scientists are asking -- How did volcanoes shape the world we know today?

Title:
VOLCANOES
THE FIRES of CREATION

Narration:
Our story starts in space...

Narration:
This is what Earth may have looked like four and a half billion years ago.

Narration:
This small planet, called Theia, is heading straight for it.

Narration:
Early Earth had multiple impacts, but this one was the most destructive.

Narration:
The collision shatters Theia, and vaporizes Earth's outer layers.

Narration:
Over time the surface reformed as a fiery, molten sea.

Narration:

But this is not a fire as we usually think of it.

Narration:

Rather, it's an unimaginable amount of heat, that is continually flowing out of the planet.

Narration:

It is released most dramatically through volcanoes.

Narration:

This is Marum Crater on Vanuatu, in the South Pacific.

Narration:

Deep inside...

Narration:

...a lava lake, one of only a handful on Earth.

Narration:

Could this be what our planet's surface looked like four and a half billion years ago?

Narration:

As the lake churns, lava is thrown out and cools to form the newest rocks on the planet.

Narration:

And every rock tells a story.

Narration:

By analyzing the rocks, geologists can learn secrets about Earth's beginnings.

Narration:

But first, you have to get to them.

Narration:

This crater is deep enough to swallow a skyscraper.

Narration:

The only way in is a treacherous rope descent down a sheer,
unstable rock face.

Narration:

And, if that isn't enough, the air is toxic.

Narration:

It's a place no normal human would go.

Narration:

Carsten Peter, however, is not normal.

Narration:

Carsten is a National Geographic photographer driven by a
passion for exploring volcanoes.

Narration:

No matter how remote...

Narration:

...or dangerous.

Narration:

For decades, his camera has captured the Earth in action.

Carsten:

I want to be as close as possible to kind of give an intimate
view into a volcano.

Carsten:

Plain photography is maybe not really enough for me, so I always
like these additional challenges in climbing down volcanoes.

Narration:

Decades ago, he led one of the first scientific and photographic expeditions down to Marum's lava lake where he collected rocks for study.

Narration:

Ever since, he's been looking for a chance to do it again.

Narration:

But right now, the miserable weather has been his biggest obstacle.

Narration:

For two weeks, there have been torrential downpours...

Narration:

...and sulfur dioxide gas is now turning them into acid rain.

Carsten:

Acid attacks everything, everything from your skin, the eyes, mucous membranes, to technical equipment, to the ropes.

Narration:

They get a break in the weather. It's not perfect, but this may be their only chance.

Narration:

Carsten is working with a team that specializes in high-risk climbs; expedition leader Geoff Mackley and climbing expert Chris Horsley.

Carsten:

You feel definitely very insignificant down there. The walls are kind of just straight up, and then you have this raging monster next to you. It's an amazing feeling of course.

Narration:

Their luck is short lived. Rain is moving back in that could trigger deadly mudslides.

Narration:

They have to come back up and wait.

Narration:

As the days go by, it becomes apparent that the seasonal monsoon rains have started early and will continue for months. Carsten will have to come back and try again.

Carsten:

It's always disappointing when you cannot fulfill what you intend to do. Vanuatu is not finished for me.

Narration:

So, if the Earth's surface once looked like Marum's lava lake, how did it go from that to what we have today?

Narration:

One theory suggests, after Earth's collision with Theia, gas and debris were blasted into space, and likely formed our moon.

Narration:

At that point, the moon was a lot closer, and its gravity pulled at our planet, helping keep the surface molten.

Narration:

The Earth's rotation slowed as the Moon drifted away, and the surfaces of both cooled and crusted over.

Narration:

It was a dynamic time.

Narration:

New crust was created by cooling magma, and where the heat broke through volcanoes were formed.

Narration:

Their eruptions sent out vast volumes of gases that helped build our early atmosphere.

Narration:

And provided water that contributed to our first oceans.

Narration:

At the same time, volcanic activity carried minerals to the surface and the landscape began to change.

Location card:

DALLOL, ETHIOPIA

Narration:

These hydrothermal pools give us a sense of what early Earth might have looked like.

Narration:

In here, are simple elements that are the building blocks for life.

Narration:

The Earth's surface was probably too hostile for life to take hold.

Narration:

In the ocean, it was a different story;

Narration:

A majority of the world's active volcanoes are underwater.

Narration:

These boiling hot hydrothermal vents are called black smokers.

Narration:

Scientists believe that simple life forms may have originated here and then spread through the oceans, becoming more complex...

Narration:

...and eventually moving onto land.

Narration:

This was just the first chapter of how volcanoes may have helped
create life on earth.

Carsten:

I was always fascinated by volcanoes, so I asked my parents to
go to Mt. Etna in Sicily.

Carsten:

It was not active, but still, I was kind of blown away.

Carsten:

And, I wanted to see my next volcano -- active.

Narration:

His next experience was almost his last.

Carsten:

Well we did everything wrong what you can do with volcanoes. We
went very close to the vent.

Carsten:

Suddenly there was a big eruption.

Carsten:

We were just running for our lives.

Carsten:

We realized immediately how dangerous volcanoes can be.

Narration:

That close call marked the start of his career as a
photographer.

Location card:

MT. ETNA, ITALY 2001

Narration:

Today, he's on a remote island in Indonesia.

Narration:

Headed for a rather moody volcano called Dukono. It's part of a region referred to as the "Ring of Fire" where plate tectonics cause a lot of volcanic activity.

Narration:

Dukono erupts every fifteen minutes, hurling rocks.

Narration:

About a mile and a half from the volcano, they find a rock.

Narration:

It tells the story of an earlier, massive eruption.

Narration:

And it's a reminder that even at this distance, they have to keep their wits about them.

Narration:

To get the vantage point he wants, Carsten needs to set up on the rim of the crater, unnervingly close... to the active vent.

Narration:

This is where his considerable experience means everything.

Carsten:

You push yourself all the time. You also get caught in the moment and while it's so mesmerizing, so beautiful and -- I mean, what does the next one look like? It might be louder, bigger and better!

Narration:

Before remote technology the images that Carsten and his colleagues took were sometimes the only way for volcanologists to see this activity up close.

Carsten:

If you look directly into the vent, it's like if you look into a cannon.

Carsten:

The projectiles can come very, very fast. Faster than you might notice them.

Carsten:

They make a sound like a fuse, so you immediately know, "Oh! that was close."

Narration:

So why do some volcanoes ooze lava, while others explode?

Location card:

KIRISHIMA, JAPAN

Narration:

It's all about the gases.

Narration:

Explosive volcanoes contain a very sticky magma, that does not flow well, and can plug the vent.

Narration:

Rising gases can't escape easily, causing pressure to build.

Narration:

And when that pressure inside reaches the breaking point...

Narration:

Now free, the gases rapidly expand -- shattering the plug.

Location card:

BATU TARA, INDONESIA

Narration:

What we call ash is actually pulverized rock.

Narration:

And it's the next chapter in the way volcanoes shaped our world.

Narration:

The ash holds a hidden secret -- it's full of nutrients.

Narration:

And where it falls, it lays the foundation for vibrant ecosystems.

Narration:

This crater is all that remains of an ancient volcano called Ngorongoro.

Narration:

Ash from that eruption laid the foundation for a rich and diverse ecosystem -- the Serengeti Plains.

Narration:

One of the major reasons is the volcanic soil that produces nutrient-rich grasses.

Narration:

Ol Doinyo Lengai erupts every few decades.

Narration:

This is the summit crater full of hardened lava.

Narration:

And after a series of major eruptions... it looked like this.

Narration:

All that ash has become vital plant food for the Serengeti.

Location card:
NYIRAGONGO
DEMOCRATIC REPUBLIC OF CONGO

Narration:
Five hundred miles to the west, volcanoes helped create another
spectacular ecosystem.

Narration:
The Virunga Mountains shelter one of the last groups of mountain
gorillas.

Narration:
The nutrient-dense foods have been linked to brain development
in ape species.

Narration:
What has been great for these gorillas has also been great for
us.

Narration:
Over centuries, humans settled next to volcanoes.

Narration:
We farmed their fertile slopes.

Location card:
BOROBUDUR TEMPLE, INDONESIA

Narration:
Built civilizations in their shadows.

Narration:
And mined their minerals.

Narration:
Today, those ancient settlements have become some of the world's
major cities.

Location card:
MT. FUJI, GREATER TOKYO, JAPAN

Narration:
But there's a paradox here: volcanoes build, but they also
destroy.

Location card:
POPOCATÉPETL, MEXICO CITY

Location card:
VESUVIUS, ITALY

Narration:
Volcanoes can be dormant for thousands of years, and people
settling near them had no idea of the potential danger.

Narration:
In 79AD, a massive eruption from Mount Vesuvius wiped out the
Roman town of Pompeii.

Narration:
The only warning signs were a series of small earthquakes.

Narration:
But when the volcano finally erupted...

Narration:
...it was with a ferocity that staggers the imagination.

Narration:
Hours later, a burning hot avalanche of gas and rock,
obliterated the city.

Narration:
Thousands died in Pompeii, and in the towns and villages that
surrounded Vesuvius.

Narration:

The ash preserved everything so perfectly that as archeologists started to uncover the ruins, they discovered evidence of a sprawling, vibrant city.

Narration:

The remnants give us a sense of what life was like in those last moments.

Narration:

Today, tourists come from all over the world to see this city, frozen in time.

Narration:

Pompeii is a cautionary tale, a reminder of how powerless we are in the face of an erupting volcano.

Narration:

Vesuvius is still a threat. It has erupted frequently since Pompeii.

Narration:

And now with millions of people living in its danger zone, even a moderate eruption could be catastrophic.

Narration:

Scientists still can't predict with accuracy, exactly when a volcano is going to erupt, but they can tell when one is waking up.

Location card:

SINABUNG, INDONESIA

Narration:

Indonesia is the most volcanically active and monitored country in the world.

Narration:

Yet, Sinabung wasn't even on the radar when it suddenly rumbled to life in 2010.

Narration:

Thousands of earthquakes prompted authorities to evacuate the area, just in time.

Narration:

Those settlements are now ghost towns, and will be until Sinabung goes back to sleep.

Narration:

Around the world, nearly half a billion people live in areas at risk from active volcanoes.

Location card:

KILAUEA CALDERA, USA

- EARLY 2018 -

Narration:

On the big island of Hawaii, the Kilauea volcano has been closely monitored for over a century.

Narration:

Since the mid 1980's, it has been erupting in a mostly slow and stable pattern.

Narration:

That predictability gave people the confidence to build houses in areas they thought were safe.

Narration:

In the spring of 2018, something changed.

Narration:

A full 25 miles from the active summit, a surge of magma pushed its way under a residential neighbourhood. The ground began to split...

Narration:
...and spatter lava.

Narration:
Burning a number of houses to the ground.

Location card:
HAWAIIAN VOLCANO OBSERVATORY
- Established 1912 -

Narration:
Even though this is one of the most watched volcanoes, no one expected the magnitude of what came next.

Narration:
In a matter of days, more than 20 fissures opened up and huge fountains of lava shot hundreds of feet into the air.

Narration:
There is no way of stopping this much lava.

Narration:
All that residents could do was watch as their neighborhoods were consumed by the flows.

Narration:
In just a few months, Kilauea had dramatically changed part of the island's landscape.

Narration:
And while no lives were lost, for the thousands of people in the area, life will never be the same.

Carsten:
I've never seen Hawaii like this. This is a huge eruption. Everything is in a big, big change. It's a really historic event.

Narration:

In three months, Kilauea produced enough lava to cover Manhattan Island almost 20 feet deep.

Narration:

Some of the most striking features were the fountains that shot lava over 100 feet in the air.

Carsten:

If you imagine how heavy magma is, I mean that's pure rock and shooting up like that in front of you.

Narration:

This eruption is part of an ongoing process that built this island up from the bottom of the sea.

Narration:

In time, new life will return to these blackened landscapes as the cycle of destruction and rebirth continues.

Location card:

YASUR, VANUATU

Narration:

Volcanoes are a powerful force. At times, you can see that power in amazing ways.

Narration:

At Yasur, explosions are so energetic that they generate visible shockwaves.

Location card:

MARUM, VANUATU

Narration:

Six months ago monsoon rains forced Carsten to give up his descent down to the lava lake at Marum crater. Now, he's back.

Narration:

But, Carsten can see a drastic change in the lava lake.

Narration:

It's now a fraction of the size.

Narration:

Could the lake be draining back into the Earth?

Narration:

This time the weather is perfect.

Narration:

So, Carsten and climbing expert, Chris Horsley, go for it.

Narration:

After a grueling two-hour descent, they make it to the crater floor.

Carsten:

I mean this lake is one of the wildest lakes you can imagine. Huge waves. The whole thing is rumbling the whole earth is shaking, it's absolutely incredible, the energy you are facing there.

Narration:

Once again, Carsten's adventures have taken him to places few of us will ever go. And he's bringing back some new rocks for scientists to study.

Narration:

If every rock tells a story, imagine what these might say.

Narration:

Maybe it's just a word, or a sentence, but even small contributions can add up to a major discovery.

Narration:

And that could lead us to a new understanding about volcanoes
and the way these fires of creation have shaped our Earth.

CREDITS.

END.