

1

00:00:00,000 --> 00:00:10,600

Is a Russian nuclear sub on a secret spying mission when a deadly fire breaks out?

2

00:00:10,600 --> 00:00:15,560

This kind of sabotage would bring the Western world to its knees.

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00:00:15,560 --> 00:00:21,560

Can cutting-edge forensic technology reveal the identity of human remains buried in an

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00:00:21,560 --> 00:00:24,280

eerie Scandinavian lake?

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00:00:24,280 --> 00:00:29,880

There were so many of them, it obviously could not be a single murder.

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00:00:29,880 --> 00:00:35,720

And what can explain a bizarre toxic haze hitting England's beaches?

7

00:00:35,720 --> 00:00:42,200

A day of fun at the beach turns into a nightmare.

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00:00:42,200 --> 00:00:46,760

The underwater realm is another dimension.

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00:00:46,760 --> 00:00:56,800

It's a physically hostile place, where dreams of promise can sink into darkness.

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00:00:56,800 --> 00:01:02,520

I'm Jeremy Wade, and I'm searching the world to bring you the most iconic and baffling

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00:01:02,520 --> 00:01:06,960

underwater mysteries known to science.

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00:01:06,960 --> 00:01:13,040

The vast majority of our ocean is unobserved, unmapped and unexplored.

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00:01:13,040 --> 00:01:18,160

It's a dangerous frontier that swallows evidence.

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00:01:18,160 --> 00:01:20,760

You have nowhere to run.

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00:01:20,760 --> 00:01:24,040

Where unknown is normal.

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00:01:24,040 --> 00:01:37,600

And understanding is rare.

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00:01:37,600 --> 00:01:41,680

We think of the internet as something that exists in the cloud.

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00:01:41,680 --> 00:01:47,960

But incredibly, 99.5% of it is located at the bottom of the ocean.

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00:01:47,960 --> 00:01:55,680

Email, banking data and top secret intel all transported by a vast network of underwater

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00:01:55,680 --> 00:01:56,680

cables.

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00:01:56,680 --> 00:02:03,200

So when a mysterious Russian spy submarine catches fire in the Arctic Ocean, tragically

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00:02:03,200 --> 00:02:11,280

killing most of her crew, it brings to light how vulnerable these cables might be to sabotage.

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00:02:11,280 --> 00:02:16,320

Do subs like this have the capability to cripple the Western world?

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00:02:16,320 --> 00:02:26,320

And if so, will we be ready and able to stop them?

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00:02:26,320 --> 00:02:29,120

July 1st, 2019.

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00:02:29,120 --> 00:02:34,920

A Russian nuclear-powered submarine emerges discreetly in the port of Severa Mosk on the

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00:02:34,920 --> 00:02:36,800

Kola Peninsula.

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00:02:36,800 --> 00:02:39,960

The vessel is in a state of emergency.

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00:02:39,960 --> 00:02:45,920

The submarine is badly damaged after catching fire in the Barents Sea.

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00:02:45,920 --> 00:02:50,440

There are reports that up to 14 people have died.

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00:02:50,440 --> 00:02:55,440

This is Russia's deadliest submarine accident in over a decade.

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00:02:55,440 --> 00:03:02,360

This sub is Russia's most secret naval asset, and any information about it is classified.

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00:03:02,360 --> 00:03:09,040

Russian authorities are very reluctant to talk about their military operations.

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00:03:09,040 --> 00:03:13,680

Moscow's silence raises suspicion all over the world.

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00:03:13,680 --> 00:03:19,800

The question everyone wants to know, what was this nuclear sub up to when the accident

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00:03:19,800 --> 00:03:23,160

happened?

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00:03:23,160 --> 00:03:25,160

Details are scarce.

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00:03:25,160 --> 00:03:29,160

The Russian Ministry of Defence doesn't name the submarine and actually says it's a state

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00:03:29,160 --> 00:03:31,200

secret.

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00:03:31,200 --> 00:03:36,760

The response prompts accusations of a cover-up and a lack of transparency that draws parallels

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00:03:36,760 --> 00:03:41,440

with past nuclear disasters.

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00:03:41,440 --> 00:03:46,640

In the 1980s, with the Chernobyl incident, the Russian government stayed silent for

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00:03:46,640 --> 00:03:48,880

over three days.

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00:03:48,880 --> 00:03:55,640

And it echoes another well-known tragic nuclear sub-accident, the Kursk.

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00:03:55,640 --> 00:04:04,440

Where 118 Russian submariners died, the Russian government stayed silent for over two days.

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00:04:04,440 --> 00:04:12,200

In 2019, will this tragedy also be shrouded in mystery?

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00:04:12,200 --> 00:04:17,240

A day after the incident, the Ministry of Defence does let slip one piece of intriguing

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00:04:17,240 --> 00:04:19,240

information.

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00:04:19,240 --> 00:04:24,320

The Russian Ministry of Defence said the submarine was mapping the sea floor.

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00:04:24,320 --> 00:04:29,520

Ocean mapping is a classic cover for top-secret underwater missions.

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00:04:29,520 --> 00:04:32,840

Is that the case here?

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00:04:32,840 --> 00:04:38,360

The identities of the 14 deceased submariners are released to the public.

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00:04:38,360 --> 00:04:41,640

And it's a bombshell revelation.

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00:04:41,640 --> 00:04:45,000

These weren't your usual Russian submarine personnel.

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00:04:45,000 --> 00:04:48,400

These were the elite of the Russian submarine service.

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00:04:48,400 --> 00:04:51,400

So much so, they had their own name.

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00:04:51,400 --> 00:04:55,760

They were called the hydronauts.

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00:04:55,760 --> 00:04:58,080

They were very high-ranking.

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00:04:58,080 --> 00:05:04,600

This indicates that there was a special mission that required their presence on board.

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00:05:04,600 --> 00:05:11,120

You can rebuild a submarine far easier than you can build experienced crew.

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00:05:11,120 --> 00:05:16,760

So losing the crew, that's a loss of a tremendous asset.

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00:05:16,760 --> 00:05:22,280

The presence of the hydronauts could throw doubt on the claim that the sub was only mapping

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00:05:22,280 --> 00:05:23,880

the sea floor.

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00:05:23,880 --> 00:05:27,240

Was its mission more ominous?

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00:05:27,280 --> 00:05:35,000

A Russian news channel identifies the mysterious submarine as the AS-31 Losharyk.

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00:05:35,000 --> 00:05:38,400

The Losharyk is a top-secret submersible.

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00:05:38,400 --> 00:05:43,800

It belongs to the Intelligence Research and Development Organization.

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00:05:43,800 --> 00:05:50,040

Its last known location was only 16-nautical miles east of Norway.

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00:05:50,040 --> 00:05:54,120

What was it doing so suspiciously close to a foreign coastline?

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00:05:57,320 --> 00:06:01,880

At the time of the accident, there was actually a NATO exercise taking place in the Norwegian

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00:06:01,880 --> 00:06:03,840

Sea.

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00:06:03,840 --> 00:06:10,200

Submarines from France, Germany, Norway, the UK and the United States are all there on

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00:06:10,200 --> 00:06:12,760

this training mission.

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00:06:12,760 --> 00:06:16,680

They have one country in mind, Russia.

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00:06:16,680 --> 00:06:21,200

Is it merely a coincidence that this ship enters these waters during such an important

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00:06:21,200 --> 00:06:23,880

NATO training exercise?

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00:06:23,880 --> 00:06:27,680

What's the Losharyk spying on these maneuvers?

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00:06:27,680 --> 00:06:35,840

Literally a goldmine of information being put out there during these training exercises.

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00:06:35,840 --> 00:06:43,960

This isn't the first time Russian military presence has been so close to Norwegian borders.

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00:06:43,960 --> 00:06:50,880

It seems that these waters are most important to Russia, but the question is why.

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00:06:50,880 --> 00:06:57,320

It's no secret that Russia has big ambitions to dominate this Arctic region.

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00:06:57,320 --> 00:07:02,280

The Arctic has been of strategic interest to Russia since the beginning of the Cold War,

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00:07:02,280 --> 00:07:06,520

where it kept its nuclear weapons arsenal.

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00:07:06,520 --> 00:07:08,400

Arctic region is enormous.

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00:07:08,400 --> 00:07:14,000

Russia has expanded its military along the whole Arctic coast.

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00:07:14,000 --> 00:07:19,600

Losharyk is just one of a growing number of nuclear-powered submarines and icebreakers

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00:07:19,600 --> 00:07:21,520

in the region.

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00:07:21,520 --> 00:07:27,080

Russia has bases and operational area for the strategic submarines which are capable of

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00:07:27,080 --> 00:07:33,080

launching intercontinental ballistic missiles to the United States and Canada.

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00:07:33,080 --> 00:07:38,840

But does the accident on board the doomed Losharyk expose another possible reason why Russia

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00:07:38,840 --> 00:07:44,720

needs a strong naval presence in the Arctic, an area that's just beginning to reveal its

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00:07:44,720 --> 00:07:48,440

untapped treasures?

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00:07:48,440 --> 00:07:59,240

In 2017, Putin suggested that the Arctic contains over \$35 trillion in untapped natural resources.

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00:07:59,240 --> 00:08:03,040

It's the proverbial goldmine.

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00:08:03,040 --> 00:08:08,640

And vessels like Losharyk can now access these rich waters through shipping routes made possible

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00:08:08,640 --> 00:08:11,800

by the melting ice sheet.

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00:08:11,800 --> 00:08:16,440

But it means other countries also have their eyes on the Arctic.

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00:08:16,440 --> 00:08:18,640

Russia makes Russia very nervous.

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00:08:18,640 --> 00:08:24,880

So the Losharyk contributes to this in the way that it strengthens the Russian presence

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00:08:24,880 --> 00:08:26,800

in the region.

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00:08:26,800 --> 00:08:33,520

But the sub's secret experimental design may hint at an even more threatening agenda,

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00:08:33,520 --> 00:08:45,960

one that could cripple the West.

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00:08:45,960 --> 00:08:51,600

As the ice cap melts in the Arctic Ocean, countries all over the world are racing to

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00:08:51,600 --> 00:08:57,160

get their hands on the area's untapped wealth of natural resources.

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00:08:57,160 --> 00:09:03,640

Could the Losharyk be part of Russia's secret plans to control these extremely lucrative

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00:09:03,640 --> 00:09:06,920

waters?

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00:09:06,920 --> 00:09:12,080

What the Losharyk was doing in the Arctic at the time of the fire is still a mystery.

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00:09:12,720 --> 00:09:19,720

But the sub's advanced capabilities and unusual design may provide vital clues.

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00:09:19,720 --> 00:09:23,880

This particular submarine used composite of a number of titanium spheres.

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00:09:23,880 --> 00:09:25,400

They're also very enclosed spaces.

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00:09:25,400 --> 00:09:30,040

So if something goes wrong in one of them, then that could become the tomb of anybody

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00:09:30,040 --> 00:09:31,520

who is in there.

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00:09:31,520 --> 00:09:36,880

Three days after the incident, it's revealed that the fire started in the sub's battery

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00:09:36,880 --> 00:09:38,320

compartment.

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00:09:38,320 --> 00:09:43,360

Although the vessel was nuclear powered, it does have batteries, a secondary source

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00:09:43,360 --> 00:09:44,520

of power.

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00:09:44,520 --> 00:09:48,680

And batteries under sea, they can let off gases.

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00:09:48,680 --> 00:09:54,600

So the crew would have been trapped in small areas, and it would have been full of fire

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00:09:54,600 --> 00:09:57,920

and smoke, and it would have contributed to their death.

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00:09:57,920 --> 00:10:02,200

So in the wrong circumstances, the Losharyk could become a death trap.

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00:10:02,200 --> 00:10:05,400

Why was it designed in a way that could endanger its crew?

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00:10:05,960 --> 00:10:12,840

A series of spheres inside allows it to dive deeper than a conventional submarine would.

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00:10:12,840 --> 00:10:19,160

The Losharyk was designed to carry out special operations at unusually extreme depths, possibly

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00:10:19,160 --> 00:10:22,480

up to 20,000 feet down.

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00:10:22,480 --> 00:10:27,640

This is 10 times deeper than the operational depth of a US submarine.

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00:10:27,640 --> 00:10:32,800

The nuclear powered sub is equipped with another strange element.

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00:10:32,800 --> 00:10:38,040

It has retractable manipulator arms on the outside of its hull.

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00:10:38,040 --> 00:10:42,840

Why would the Losharyk need these robotic arms?

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00:10:42,840 --> 00:10:49,320

The sub's advanced capabilities give Western intelligence reason to be suspicious.

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00:10:49,320 --> 00:10:56,800

Losharyk could be hiding a sinister agenda, one that would bring mayhem across the globe.

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00:10:56,800 --> 00:11:02,000

Maybe the submarine was trying to do something very clandestine and potentially illegal.

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00:11:02,000 --> 00:11:07,840

Today, nearly all of our daily communications are carried through underwater cables, nearly

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00:11:07,840 --> 00:11:12,720

750,000 miles of them running along the sea floor.

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00:11:12,720 --> 00:11:17,080

On a daily basis, what could be going through these far-bred object cables?

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00:11:17,080 --> 00:11:21,160

Well, it could be financial transactions, it could be any kind of secret communications,

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00:11:21,160 --> 00:11:26,360

it can be the Allied nations communicating with their military assets around the world.

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00:11:26,360 --> 00:11:30,680

Western intelligence speculates that with its unique design, the Losharyk's mission

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00:11:30,680 --> 00:11:38,040

was to tamper with these deep-sea cables and possibly even sabotage them.

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00:11:38,040 --> 00:11:46,360

Since 2015, various NATO officials were reporting that Russian submarines were operating quite

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00:11:46,360 --> 00:11:49,760

close to the seabed cables.

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00:11:49,760 --> 00:11:53,480

And of course the question was why?

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00:11:53,480 --> 00:11:59,480

Severing them, severing the flow of information would strike very hard the economic and financial

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00:11:59,480 --> 00:12:04,280

system and probably would wreak havoc on the Western societies.

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00:12:04,280 --> 00:12:09,760

So far there is no hard evidence that confirms Losharyk's true mission.

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00:12:09,760 --> 00:12:15,720

But what's telling is that even after the tragic fire that killed 14 elite submariners,

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00:12:15,720 --> 00:12:19,560

it remains a crucial asset for Russia.

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00:12:19,560 --> 00:12:24,520

Losharyk will be repaired and it will return to service because it's so important for the

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00:12:24,520 --> 00:12:28,320

research, for the intelligence gathering, for the Russian Navy and the Russian Armed

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00:12:28,320 --> 00:12:30,520

Forces in general.

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00:12:30,520 --> 00:12:37,160

This mysterious sub will take years to repair, but its potential to wreak havoc in the future

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00:12:37,160 --> 00:12:48,120

remains very real.

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00:12:48,120 --> 00:12:53,960

Ancient underwater burial sites have been discovered all over Northern Europe, but few are as

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00:12:53,960 --> 00:12:59,920

mysterious as the one found in a remote lake in Finland where the remains of around 100

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00:12:59,920 --> 00:13:02,280

people are uncovered.

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00:13:02,280 --> 00:13:07,560

Who these bones belong to and why they are here have remained unanswered for over three

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00:13:07,560 --> 00:13:08,560

centuries.

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00:13:08,560 --> 00:13:15,120

Now, with incredible advances in DNA technology, these cryptic bones might finally start to

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00:13:15,120 --> 00:13:22,920

reveal their secrets.

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00:13:23,920 --> 00:13:29,440

In 2018, scientists are examining human remains discovered in a very strange, gruesome looking

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00:13:29,440 --> 00:13:33,640

lake in Western Finland known as Levenluhta.

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00:13:33,640 --> 00:13:37,580

It's a real mystical but eerie sight.

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00:13:37,580 --> 00:13:46,400

In the springtime, the lake's iron-rich, blood-like water foams up through the ground.

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00:13:46,400 --> 00:13:51,240

Devoid of oxygen, it's perfect for preserving bones.

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00:13:51,240 --> 00:13:55,440

This stops the microorganisms from eating the bodies of dead people buried inside of

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00:13:55,440 --> 00:13:56,440

them.

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00:13:56,440 --> 00:14:03,680

The mystery begins in 1884 when local men working in Levenluhta are shocked to discover

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00:14:03,680 --> 00:14:06,280

eight human skulls.

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00:14:06,280 --> 00:14:08,480

And it doesn't stop there.

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00:14:08,480 --> 00:14:11,240

More and more human bones are recovered.

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00:14:11,240 --> 00:14:15,840

The remains of approximately 100 people were found at this site.

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00:14:15,840 --> 00:14:17,960

It's a gruesome discovery.

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00:14:17,960 --> 00:14:20,440

Something extraordinary is going on at Levenluhta.

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00:14:20,440 --> 00:14:26,760

It takes nearly 150 years for scientists to piece together clues from the human remains

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00:14:26,760 --> 00:14:34,440

and start to unravel the riddle how so many bodies ended up in this chilling, watery grave.

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00:14:34,440 --> 00:14:51,600

A mysterious and grisly lake in Finland is giving up numerous human remains.

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00:14:51,600 --> 00:14:56,720

Archaeologists suspect they could be the victims of a brutal sacrifice.

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00:14:56,720 --> 00:15:12,960

Local contemporary forensic analysis reveal the lake's dark secret.

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00:15:12,960 --> 00:15:19,000

When the mass of human remains is uncovered in 1884, it's assumed they are war victims

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00:15:19,000 --> 00:15:21,480

from the 16th century.

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00:15:21,480 --> 00:15:25,800

People believe that these bodies might be from the Kudjul war, which was a peasant uprising.

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00:15:25,800 --> 00:15:32,840

The peasants were fighting against exploitation by the nobility and the military.

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00:15:32,840 --> 00:15:38,080

The name Kudjul comes from the type of weapons that the peasants used, blunt objects such

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00:15:38,080 --> 00:15:40,000

as the Kudjul.

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00:15:40,000 --> 00:15:45,880

The war was known for its weapons, but no weapons are found at Levenluhta.

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00:15:45,880 --> 00:15:52,680

And the investigation throws yet another perplexing conundrum that scientists just can't solve.

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00:15:52,680 --> 00:15:57,040

Shockingly, they discover that the bones are mostly women and children.

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00:15:57,040 --> 00:16:01,320

The presence of women and children doesn't fit with the characteristics of a typical

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00:16:01,320 --> 00:16:03,000

war grave.

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00:16:03,000 --> 00:16:10,600

At the turn of the 20th century, an anthropologist throws even more doubt on the Kudjul war theory.

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00:16:10,600 --> 00:16:15,880

Analysis of the skeletal remains reveals that the skulls are strangely narrower and longer

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00:16:15,880 --> 00:16:19,040

than those of Finnish people.

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00:16:19,040 --> 00:16:24,560

Scientists propose that the people are not from Finland at all, but from mainland Europe,

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00:16:24,560 --> 00:16:31,400

where there are records of sacrificial rituals and burying the dead in water.

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00:16:31,400 --> 00:16:37,400

There are multiple examples of watery graves and water burials in Northern Europe.

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00:16:37,400 --> 00:16:43,280

We often see watery burials as a sacrifice to the gods, in which case criminals or bandits

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00:16:43,280 --> 00:16:46,360

could be the ones who are buried there.

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00:16:46,360 --> 00:16:53,360

They're usually found strangled, bound, there's acts of violence, throat slit.

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00:16:53,360 --> 00:16:58,600

But the bones found in Levenluhta are missing a crucial piece of evidence to support this

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00:16:58,600 --> 00:17:00,160

theory.

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00:17:00,160 --> 00:17:05,760

These Finnish remains, there appears to be no acts of violence.

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00:17:05,760 --> 00:17:09,720

The Levenluhta remains show no signs of trauma, so this could be evidence that this wasn't

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00:17:09,720 --> 00:17:11,360

a sacrifice.

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00:17:11,360 --> 00:17:19,480

It's not until 1993 that a breakthrough in forensic science begins to untangle this mystery.

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00:17:19,480 --> 00:17:26,160

Through radiocarbon analysis, scientists can finally date the bones.

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00:17:26,160 --> 00:17:29,560

Turns out they date to the Iron Age.

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00:17:29,560 --> 00:17:35,600

The radiocarbon dates suggest that these people died somewhere between 500 and 700 AD.

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00:17:35,600 --> 00:17:41,960

Now with specific dates, archaeologists investigate what was going on in Levenluhta around this

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00:17:41,960 --> 00:17:42,960

time.

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00:17:42,960 --> 00:17:49,760

They turn to ancient Norse mythology, and it provides a crucial clue of a terrifying

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00:17:49,760 --> 00:17:52,640

doomsday event.

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00:17:52,640 --> 00:17:57,040

Ancient Norse mythology mentions three successive winters without any summer, which they call

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00:17:57,040 --> 00:17:58,480

the Fimble Winter.

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00:17:58,480 --> 00:18:04,240

In the legend, snow comes in from all directions and ends all life on earth.

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00:18:04,240 --> 00:18:11,560

A recent study in 2019 links the Fimble Winter to a series of real-life volcanic eruptions

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00:18:11,560 --> 00:18:14,960

in Central America in the 6th century.

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00:18:14,960 --> 00:18:22,800

A huge volcanic eruption which sparked darkness and social collapse across the world.

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00:18:22,800 --> 00:18:24,480

This would have impacted agriculture.

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00:18:24,480 --> 00:18:31,120

It would have led to crop loss and famine all across the Northern Hemisphere.

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00:18:31,120 --> 00:18:37,000

Ancient crop failures caused the Levenluhta people to die of starvation.

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00:18:37,000 --> 00:18:43,400

In 2019, with new technology, scientists finally analyzed the bones to determine if this freak

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00:18:43,400 --> 00:18:48,800

climate disaster could be the cause of death.

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00:18:48,800 --> 00:18:54,440

Isotopic analysis is used to reconstruct ancient diets, and the way that it's done is by looking

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00:18:54,440 --> 00:18:59,160

at the carbon and the nitrogen values, and by doing that comparing it to different food

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00:18:59,160 --> 00:19:00,160

sources.

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00:19:01,040 --> 00:19:05,840

Isotopic analysis reveals something unexpected.

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00:19:05,840 --> 00:19:14,080

These people exploited food from three sources, sea, earth, and fresh water.

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00:19:14,080 --> 00:19:19,400

They had an incredibly varied diet and were actually really healthy when they died.

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00:19:19,400 --> 00:19:24,200

Their versatile diet would make them well-equipped to deal with any sort of crop failure due to

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00:19:24,200 --> 00:19:27,000

a catastrophic event.

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00:19:27,000 --> 00:19:32,520

So modern science rules out the possibility that this extreme long winter killed the lake

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00:19:32,520 --> 00:19:34,400

victims.

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00:19:34,400 --> 00:19:40,400

After a nearly 150-year investigation, are we any closer to knowing why so many bodies

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00:19:40,400 --> 00:19:43,360

ended up in Levenluhta Lake?

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00:19:43,360 --> 00:19:48,240

Answers could be concealed in the ancient traditions of these mysterious people.

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00:19:57,680 --> 00:20:03,080

The ancient Levenluhta lake bones are so well preserved that they still hold vital clues

236

00:20:03,080 --> 00:20:06,160

about who these people might be.

237

00:20:06,160 --> 00:20:11,560

DNA technology may finally reveal the identity of the people who were buried in this watery

238

00:20:11,560 --> 00:20:12,560

grave.

239

00:20:12,560 --> 00:20:18,760

In 2019, after samples of the bones are DNA tested, the scientists make a major breakthrough

240

00:20:18,760 --> 00:20:24,080

in this nearly 150-year-old investigation.

241

00:20:24,160 --> 00:20:29,960

DNA testing indicates that these were Sami people.

242

00:20:29,960 --> 00:20:35,640

The Sami are indigenous to Finland, but they inhabit areas much further north, nowhere

243

00:20:35,640 --> 00:20:38,920

close to the lake.

244

00:20:38,920 --> 00:20:44,560

What were these Sami people doing so far south, and how do they all end up in an underwater

245

00:20:44,560 --> 00:20:48,320

grave?

246

00:20:48,320 --> 00:20:54,120

With the latest genetic revelations, the puzzle pieces are coming together.

247

00:20:54,120 --> 00:21:01,120

Finnish scientists now have a new theory as to why these people were buried in a lake.

248

00:21:01,120 --> 00:21:07,320

And the answer could be found deep in Sami mythology.

249

00:21:07,320 --> 00:21:13,440

The Sami word, Saiva, is used to refer to a holy lake and the spirits living within

250

00:21:13,440 --> 00:21:14,440

it.

251

00:21:14,840 --> 00:21:19,520

Saiva lakes take on magical and mystical properties, and they represent the underworld

252

00:21:19,520 --> 00:21:22,160

for the Sami people.

253

00:21:22,160 --> 00:21:27,480

Were these ancient Sami people buried in the lake, which they believe to be a gateway to

254

00:21:27,480 --> 00:21:29,920

the afterlife?

255

00:21:29,920 --> 00:21:35,520

This exciting new evidence in an investigation that has lasted nearly a century and a half

256

00:21:35,520 --> 00:21:43,760

is beginning to rewrite the story of one of Europe's most extraordinary burial sites.

257

00:21:43,760 --> 00:21:50,480

The mystery of why these Sami people were buried in Levenlutta lake is not yet solved.

258

00:21:50,480 --> 00:21:56,120

However, as modern technology continues to transform archaeology, it may one day bring

259

00:21:56,120 --> 00:22:04,000

us closer to fully understanding our ancestors and their connection to the underwater world.

260

00:22:05,000 --> 00:22:15,440

A summer day at the beach turns ugly when a strange haze hits England's southern coast

261

00:22:15,440 --> 00:22:18,640

and hundreds of people end up in the hospital.

262

00:22:18,640 --> 00:22:23,680

No one's sure what's causing it and it's followed by similar incidents.

263

00:22:23,680 --> 00:22:31,000

Can authorities solve this toxic beach mystery before even more people fall ill?

264

00:22:35,000 --> 00:22:43,840

August 2017, Burling Gap Beach on the southern coast of England.

265

00:22:43,840 --> 00:22:47,760

Crowds are enjoying one of the hottest days of the year.

266

00:22:47,760 --> 00:22:53,120

Then like a scene from a horror movie, the air turns into a yellowy haze and begins

267

00:22:53,120 --> 00:22:59,880

to smell unbearably foul.

268

00:22:59,880 --> 00:23:04,800

Some say it's like the smell of burnt plastic and corpses.

269

00:23:04,800 --> 00:23:10,960

A nice day out in the sunshine turns into a nightmare for these beach-goers.

270

00:23:10,960 --> 00:23:17,440

Passerby's are heaving and wretching after coming in contact with this toxic mist.

271

00:23:17,440 --> 00:23:23,520

One person captures the bizarre moment on video.

272

00:23:23,520 --> 00:23:28,120

Kyle, when did you first start to notice things weren't quite right on the beach?

273

00:23:28,120 --> 00:23:34,400

I noticed sort of on the horizon, it was the yellowy kind of cloud getting closer and closer

274

00:23:34,400 --> 00:23:38,160

to the coastline and noticed more and more people around us.

275

00:23:38,160 --> 00:23:42,280

People coughing, spluttering, eyes watering.

276

00:23:42,280 --> 00:23:43,520

This is such an unusual incident.

277

00:23:43,520 --> 00:23:47,680

It must have been really scary not knowing what was happening.

278

00:23:47,680 --> 00:23:54,320

Everyone was rushing to their cars, there was traffic everywhere, coast guards, fire

279

00:23:54,320 --> 00:23:56,040

service, police, ambulance.

280

00:23:56,040 --> 00:24:01,200

It's so strange to just like, thousands of people just empty now on the road and just

281

00:24:01,200 --> 00:24:05,520

there was definitely much panic going on at the same time.

282

00:24:05,520 --> 00:24:08,680

A major incident is declared.

283

00:24:08,680 --> 00:24:14,200

The local hospital ends up carrying out one of the biggest mass decontaminations in England's

284

00:24:14,200 --> 00:24:16,480

history.

285

00:24:16,480 --> 00:24:20,440

About 200 people went to the hospital.

286

00:24:20,440 --> 00:24:24,680

This frightening toxic haze is coming in from the sea.

287

00:24:24,680 --> 00:24:32,720

But what's causing it is a mystery that no one can figure out.

288

00:24:32,720 --> 00:24:39,920

The scene in Burling Gap reminds people of a similar freakish incident four years earlier.

289

00:24:39,920 --> 00:24:46,000

In 2013, citizens living in South England complain of nausea and headaches and a foul

290

00:24:46,000 --> 00:24:50,400

rotten egg stench.

291

00:24:50,400 --> 00:24:55,720

This time, authorities can pinpoint where it's coming from.

292

00:24:55,720 --> 00:25:03,160

A gas leak from a power station in Normandy that has travelled 200 miles to the UK shore.

293

00:25:03,160 --> 00:25:09,840

If the wind is blowing the wrong way, then all that pollution gets blown across to the

294

00:25:09,840 --> 00:25:11,240

UK.

295

00:25:11,240 --> 00:25:16,960

Is another gas leak from France to be blamed for causing a stink on Britain's shore again

296

00:25:16,960 --> 00:25:19,760

four years later?

297

00:25:19,760 --> 00:25:25,720

Scientists have tried reverse modelling the winds at those particular times to pinpoint

298

00:25:25,720 --> 00:25:30,600

the location of the source of these toxins.

299

00:25:30,600 --> 00:25:37,280

The models show that on August 27th 2017, the surface air had come from an easterly direction

300

00:25:37,280 --> 00:25:43,600

and before that had been parallel to the coast and coming from the west.

301

00:25:43,600 --> 00:25:50,640

So a gas leak in France is quickly ruled out as the cause.

302

00:25:50,640 --> 00:25:57,320

There's no doubt however that the strange haze is coming from somewhere out at sea.

303

00:25:57,320 --> 00:26:02,360

Could the answer be found in a lethal marine phenomenon?

304

00:26:02,360 --> 00:26:07,240

In different water bodies, you will have what's called an algal bloom and this can happen

305

00:26:07,240 --> 00:26:10,720

as the seasons are warming up.

306

00:26:10,840 --> 00:26:16,720

Algal blooms are known sometimes to produce toxic chemicals that are not good for people.

307

00:26:16,720 --> 00:26:22,000

Two days after the incident, water samples are taken and tested for signs of an algal

308

00:26:22,000 --> 00:26:23,500

bloom.

309

00:26:23,500 --> 00:26:28,040

The measurements that were done in this case suggest that there just wasn't enough algae

310

00:26:28,040 --> 00:26:32,840

in the water to be producing anything that would harm human health on the beach.

311

00:26:32,840 --> 00:26:36,240

So what did cause this toxic mist?

312

00:26:36,240 --> 00:26:43,240

If it's not coming from the water, are there any other clues hiding in the air we breathe?

313

00:26:43,240 --> 00:26:50,240

Authorities turn to local air monitoring stations and they reveal something disturbing.

314

00:26:58,760 --> 00:27:04,240

When a toxic haze hits the southern coast of Britain, what's causing it leaves scientists

315

00:27:04,240 --> 00:27:05,240

puzzled.

316

00:27:05,240 --> 00:27:10,240

Could the answer lie in the foul smell coming from the toxic fog?

317

00:27:10,240 --> 00:27:19,240

If people are reporting smelling rotten eggs, my first idea is going to be there's sulfur

318

00:27:19,240 --> 00:27:22,080

dioxide out there.

319

00:27:22,080 --> 00:27:28,720

One air monitoring station reports an unusual increase in sulfur dioxide.

320

00:27:28,720 --> 00:27:34,440

Meteorological evidence already suggests the source is offshore.

321

00:27:34,440 --> 00:27:38,920

So the sulfur dioxide seems to be coming from the English Channel.

322

00:27:38,920 --> 00:27:43,120

The sulfur dioxide could have come from ships in the English Channel.

323

00:27:43,120 --> 00:27:48,320

The English Channel separates the UK and France and is one of the world's busiest shipping

324

00:27:48,320 --> 00:27:49,960

lanes.

325

00:27:49,960 --> 00:27:54,560

But how could this have produced toxic sulfur dioxide?

326

00:27:54,560 --> 00:27:58,880

The cargo ships contain hazardous and deadly chemicals.

327

00:27:58,880 --> 00:28:03,800

So sometimes shipping containers might fall off a ship which cause hazardous chemicals

328

00:28:03,800 --> 00:28:08,360

to enter the water and end up on nearby beaches.

329

00:28:08,360 --> 00:28:13,840

Authorities investigate the ships that were in the area at the time of the toxic haze.

330

00:28:13,840 --> 00:28:19,680

There are no reports of sulfur dioxide related accidents.

331

00:28:19,680 --> 00:28:24,640

Local authorities draw a blank and are no closer to solving the mystery of the toxic

332

00:28:24,640 --> 00:28:27,640

haze in Berlin Gap.

333

00:28:27,640 --> 00:28:32,360

The case goes cold until two years later.

334

00:28:32,360 --> 00:28:40,920

In 2019, only 25 miles away, a scarily familiar state of emergency is declared on the coast.

335

00:28:40,920 --> 00:28:43,880

Witnesses describe people heaving or wretching.

336

00:28:43,880 --> 00:28:46,080

The beaches are evacuated.

337

00:28:46,080 --> 00:28:51,760

Adding to the fear, the nightmare continues along the same coastline in yet another frightening

338

00:28:51,760 --> 00:28:52,760

scene.

339

00:28:52,760 --> 00:28:59,120

Only two weeks later, another 150 people fall ill on the coastline.

340

00:28:59,120 --> 00:29:04,200

Could the toxic chemical have returned?

341

00:29:04,200 --> 00:29:09,240

And authorities are very worried the whole thing could happen again.

342

00:29:09,240 --> 00:29:15,080

With three near identical cases within a space of two years, scientists desperately need

343

00:29:15,080 --> 00:29:20,800

to crack the unknown source of the toxic haze.

344

00:29:20,800 --> 00:29:26,240

Satellite data could hold the answer that everybody desperately seeks.

345

00:29:26,240 --> 00:29:34,840

In 2017, a satellite image captures a strange plume coming from the English Channel.

346

00:29:34,840 --> 00:29:44,120

One theory is that these toxic gases might come from some release of toxic substances

347

00:29:44,120 --> 00:29:45,120

from shipwrecks.

348

00:29:45,120 --> 00:29:55,560

They do often change, move, adjust, and you do get leakage of potentially polluting substances.

349

00:29:55,560 --> 00:30:02,400

The English Channel is littered with shipwrecks, sunk during the First and Second World Wars.

350

00:30:02,400 --> 00:30:06,720

These underwater ticking time bombs could be an explanation for the hazardous chemicals

351

00:30:06,720 --> 00:30:09,080

that arrive on the beach.

352

00:30:09,080 --> 00:30:14,400

The satellite image seems to show the plume coming from almost exactly the same location

353

00:30:14,400 --> 00:30:19,520

as a shipwreck, sunk by a German mine in 1917.

354

00:30:19,520 --> 00:30:25,880

It's known that there was a shipwreck from World War I, the SS mirror that lays in that

355

00:30:25,880 --> 00:30:29,360

particular part of the seabed.

356

00:30:29,360 --> 00:30:33,760

Investigators work out that if chemicals from the wreck were transported in the water, it's

357

00:30:33,760 --> 00:30:40,440

possible they could have reached Burling Gap at the exact same time the incident was reported.

358

00:30:40,440 --> 00:30:45,560

If the toxic plume was in the air, however, because of the easterly wind direction, the

359

00:30:45,560 --> 00:30:49,680

wreck is unlikely to have been the source.

360

00:30:49,680 --> 00:30:55,120

Authorities now believe a shipwreck leaking a toxic chemical is plausible, but it hasn't

361

00:30:55,120 --> 00:30:59,760

yet been categorically confirmed as the toxic culprit.

362

00:31:00,760 --> 00:31:06,360

A massive effort has been made to track down the source of this bizarre and terrifying

363

00:31:06,360 --> 00:31:10,160

haze, but there's still no definitive answer.

364

00:31:10,160 --> 00:31:17,000

And whether this poisonous seaside air will become more frequent and more dangerous remains

365

00:31:17,000 --> 00:31:19,320

a mystery.

366

00:31:19,320 --> 00:31:33,080

When divers explore a 300 year old wreck in the icy depths of the Baltic Sea, they uncover

367

00:31:33,080 --> 00:31:41,080

a vast amount of cargo, including an unexpected find, fragments of a Bible.

368

00:31:41,080 --> 00:31:46,720

Researchers are perplexed by how these paper pages could have survived underwater for three

369

00:31:46,720 --> 00:31:48,280

centuries.

370

00:31:48,280 --> 00:31:55,480

In their quest for answers, they reveal a ship with a saintly name, but a sinful past.

371

00:31:55,480 --> 00:32:02,720

2002, a team of Russian divers is exploring a shipwreck, hiding in the cold, dark waters

372

00:32:02,720 --> 00:32:06,880

of the Baltic Sea.

373

00:32:06,880 --> 00:32:12,160

They believe it could be the wreck of an 18th century vessel that was entangled in a corruption

374

00:32:12,160 --> 00:32:18,160

scandal at the time of Peter the Great.

375

00:32:18,160 --> 00:32:23,360

It's reputed to be hiding secret and legal cargo.

376

00:32:23,360 --> 00:32:28,760

Piecing together information from historical records and exploration of the wreck, the

377

00:32:28,760 --> 00:32:34,040

divers hope to find clues that will confirm that this is the infamous ship they've been

378

00:32:34,040 --> 00:32:36,280

looking for.

379

00:32:36,280 --> 00:32:42,480

They focus their attention first on some pieces of wood.

380

00:32:42,480 --> 00:32:47,560

They find bits of timber, which they can then radiocarbon date.

381

00:32:47,560 --> 00:32:51,760

Cainwilton dates from about 1650 to 1680.

382

00:32:51,760 --> 00:32:55,480

So it had to be made after them.

383

00:32:55,480 --> 00:32:59,520

More intriguing is a broken ceramic dish.

384

00:32:59,520 --> 00:33:09,640

It features an image of the biblical archangel Raphael, engraved with a date, 1696.

385

00:33:09,640 --> 00:33:14,520

These two pieces of dating evidence indicate this is the wreck of the archangel Raphael.

386

00:33:14,520 --> 00:33:18,880

The archaeologists realized they found a very special shipwreck.

387

00:33:18,880 --> 00:33:25,000

The divers have conclusive proof they found a notorious shipwreck with a 300-year-old

388

00:33:25,000 --> 00:33:29,200

unsolved mystery.

389

00:33:29,200 --> 00:33:33,920

Historical sources suggest the archangel Raphael could have been laden with smuggled

390

00:33:33,920 --> 00:33:37,440

cargo when it sank.

391

00:33:37,440 --> 00:33:42,840

After three centuries underwater, is there a trove of contraband still hiding inside

392

00:33:42,840 --> 00:33:45,920

the wreck?

393

00:33:45,920 --> 00:33:51,480

Researchers begin their investigation in Russian state navy archives, hoping to reconstruct

394

00:33:51,480 --> 00:33:55,040

the ship's final voyage.

395

00:33:55,040 --> 00:34:01,040

October 1724, the merchant ship departs St Petersburg.

396

00:34:01,040 --> 00:34:07,080

It's intended destination, the German port city of Lubeck.

397

00:34:07,080 --> 00:34:12,800

It's normal for the trade between the German and Russian ports from St Petersburg to Lubeck.

398

00:34:12,800 --> 00:34:19,880

There is a row of trading towns, really, entrepons along the coast.

399

00:34:19,880 --> 00:34:27,000

It was a vibrant trading economy and the archangel Raphael was a key part of this.

400

00:34:27,000 --> 00:34:32,960

The location of the wreck, however, is mysteriously far away from its intended route.

401

00:34:32,960 --> 00:34:38,320

The ship was originally headed to Lubeck, which is nowhere close to where it was found.

402

00:34:38,320 --> 00:34:40,960

So what the heck was it doing there?

403

00:34:40,960 --> 00:34:46,520

Luckily for the investigators, details of the ship's sinking are well documented and

404

00:34:46,520 --> 00:34:49,800

they are yielding some critical clues.

405

00:34:49,800 --> 00:34:56,880

The historical archives suggest that this ship was lost by getting stuck in ice and

406

00:34:56,880 --> 00:35:02,520

as the ice moves the ship is basically crushed and wrecked.

407

00:35:02,520 --> 00:35:08,840

The crew all survive and are able to successfully get away from the ship before it sinks.

408

00:35:08,840 --> 00:35:14,160

The wreckors describe how local inhabitants try to salvage cargo through an ice hole a

409

00:35:14,160 --> 00:35:17,240

few months after the ship goes down.

410

00:35:17,240 --> 00:35:23,200

They recover over 350 bales of leather and say there's more cargo out of reach inside

411

00:35:23,200 --> 00:35:25,160

the wreck.

412

00:35:25,160 --> 00:35:29,920

In their quest to discover if these could be smuggled goods, the investigators turn to

413

00:35:29,920 --> 00:35:37,840

original customs documents and they expose something highly suspicious.

414

00:35:37,840 --> 00:35:44,200

When the Archangel Raphael departs St. Petersburg in October of 1724, according to customs records

415

00:35:44,200 --> 00:35:46,480

it's nearly empty.

416

00:35:46,480 --> 00:35:50,080

This contradicts what the local divers saw.

417

00:35:50,080 --> 00:35:53,840

There might have been some smuggling going on.

418

00:35:53,840 --> 00:35:57,440

The ship was clearly up to no good.

419

00:35:57,440 --> 00:36:02,560

Not only does this strongly suggest the ship was carrying illegal goods when it sank, it

420

00:36:02,560 --> 00:36:09,280

also helps researchers understand why the wreck is far from its intended destination.

421

00:36:09,280 --> 00:36:16,280

It's thought Archangel Raphael stops on the way to Lubeck in a place called Krasnia Gorka

422

00:36:16,280 --> 00:36:20,320

where it could possibly have taken on the contraband.

423

00:36:20,320 --> 00:36:25,400

This place is well known for its smuggling activities and suspiciously the Archangel

424

00:36:25,400 --> 00:36:29,680

Raphael stays there for a biblical 40 days.

425

00:36:29,680 --> 00:36:35,840

The long stopover results in the ship getting trapped in the ice and abandoned by its crew,

426

00:36:35,840 --> 00:36:39,240

after which it sinks.

427

00:36:39,240 --> 00:36:44,440

Everything on board the Archangel Raphael, from personal items to cargo, is left just as it

428

00:36:44,440 --> 00:36:45,800

is.

429

00:36:45,800 --> 00:36:52,560

And the ship lies forgotten in the Baltic waters for three centuries.

430

00:36:52,560 --> 00:36:55,760

Until 2014.

431

00:36:55,760 --> 00:37:01,840

Have these precious artifacts survived and what dark secrets can they reveal about the

432

00:37:01,840 --> 00:37:14,840

Archangel Raphael?

433

00:37:14,840 --> 00:37:20,600

Russian underwater archaeologists hope to discover what treasures are hiding inside the 18th

434

00:37:20,600 --> 00:37:29,920

century shipwreck Archangel Raphael and whether they've survived 300 years underwater.

435

00:37:29,920 --> 00:37:36,000

After investigating historical records, maritime archaeologists now need to go underwater to

436

00:37:36,000 --> 00:37:41,800

find out more about this infamous merchant ship.

437

00:37:41,800 --> 00:37:46,240

The investigators plan to excavate the ship.

438

00:37:46,360 --> 00:37:49,560

In 2014, excavations begin.

439

00:37:49,560 --> 00:37:54,360

Divers look for any clues that might help uncover the truth about what the ship is carrying

440

00:37:54,360 --> 00:37:57,040

when it sinks.

441

00:37:57,040 --> 00:38:01,680

Is it possible the cargo could have survived for three centuries?

442

00:38:01,680 --> 00:38:06,640

The beauty of the Baltic Sea when it comes to preserving a shipwreck is the water is

443

00:38:06,640 --> 00:38:07,640

brackish.

444

00:38:07,640 --> 00:38:17,200

All the little critters that would normally eat and degrade organic materials just aren't

445

00:38:17,200 --> 00:38:19,400

present.

446

00:38:19,400 --> 00:38:24,280

As divers explore inside the shipwreck, they find something unusual.

447

00:38:24,280 --> 00:38:29,720

They're shocked to find artifacts covered completely in tar.

448

00:38:29,720 --> 00:38:33,480

Tar was often transported inside of wooden barrels in this period.

449

00:38:33,880 --> 00:38:38,520

Now remember that the ship is locked in ice and has been gradually, slowly over a period

450

00:38:38,520 --> 00:38:44,080

of time crushed and crushed and eventually the tar starts to leak out and it goes all

451

00:38:44,080 --> 00:38:46,840

over the various artifacts.

452

00:38:46,840 --> 00:38:54,160

It's a setback for the archaeologists who were hoping to find the artifacts still intact.

453

00:38:54,160 --> 00:38:58,920

Then the mystery of the ship's cargo takes a new twist with the discovery of a book of

454

00:38:58,920 --> 00:39:02,000

Psalms.

455

00:39:02,000 --> 00:39:06,440

The book, strangely, is unlike the other artifacts.

456

00:39:06,440 --> 00:39:11,720

They find one of the most precious items of cargo is not covered in tar.

457

00:39:11,720 --> 00:39:13,360

And why is this?

458

00:39:13,360 --> 00:39:18,480

Scientists restoring these pages in their labs are surprised to find them perfectly intact

459

00:39:18,480 --> 00:39:19,480

and legible.

460

00:39:19,480 --> 00:39:24,280

It's very rare to find paper preserved on these sorts of sites.

461

00:39:24,280 --> 00:39:28,360

Instead of tar, this book has been hiding away in silt.

462

00:39:29,320 --> 00:39:35,080

Silt or mud is very good at preserving artifacts because it creates sort of anoxic environment.

463

00:39:35,080 --> 00:39:42,000

It reduces the amount of oxygen, which is what organisms need in order to decompose.

464

00:39:42,000 --> 00:39:48,320

Why it's only this holy book that avoided being covered in tar is a mystery.

465

00:39:48,320 --> 00:39:53,480

Being named the Archangel Raphael, is there some kind of magical or spiritual activity

466

00:39:53,480 --> 00:39:55,480

going on?

467

00:39:55,600 --> 00:40:02,320

Unable to see the complete load of cargo still hiding inside, the dive team employs photogrammetry

468

00:40:02,320 --> 00:40:05,120

to fully survey the wreck.

469

00:40:05,120 --> 00:40:12,120

Photogrammetry is a series of photographs or images, and when we merge them together,

470

00:40:12,120 --> 00:40:16,520

we can create a three-dimensional image of the object.

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00:40:16,520 --> 00:40:23,120

The incredibly accurate 3D model of the ship and seven years of painstaking excavation begin

472

00:40:23,160 --> 00:40:28,960

to yield stunning discoveries, including items of clothing that just shouldn't have survived

473

00:40:28,960 --> 00:40:30,840

for so long.

474

00:40:30,840 --> 00:40:35,840

What makes the Archangel Raphael so special is the preservation of organic material on

475

00:40:35,840 --> 00:40:39,720

this incredible site.

476

00:40:39,720 --> 00:40:45,560

And after years of researching the state archives, they finally find physical evidence of smuggled

477

00:40:45,560 --> 00:40:48,000

goods on board the ship.

478

00:40:48,000 --> 00:40:53,000

The ship is in a legal possession of goods.

479

00:40:53,000 --> 00:40:58,000

The 18th century was known as the Golden Age of Smuggling.

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00:40:58,000 --> 00:41:04,000

The ship is a ship that was built in the 18th century, and it was built in the 18th century

481

00:41:04,000 --> 00:41:08,000

and was called the Golden Age of Smuggling.

482

00:41:08,000 --> 00:41:14,000

The ship was built in the 18th century, and it was built in the 18th century, and it was

483

00:41:14,000 --> 00:41:17,000

known as the Golden Age of Smuggling.

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00:41:17,000 --> 00:41:24,000

And the staggering amount of artifacts retrieved three centuries later reveals the true scale

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00:41:24,000 --> 00:41:30,000

of the ship's lucrative cloak and dagger operation.

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00:41:30,000 --> 00:41:38,000

After years of investigating the wreck, 400 items are recovered in total, including things

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00:41:38,000 --> 00:41:45,000

which are impossible to imagine in their worth, and things we had never believed would be

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00:41:45,000 --> 00:41:48,000

recovered from such a wreck.

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00:41:48,000 --> 00:41:55,000

Researchers believe there could be even more secrets hiding in the Archangel Raphael.

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00:41:55,000 --> 00:42:00,000

Wrecks and historical treasures like these lead us to wonder what other time capsules

491

00:42:00,000 --> 00:42:05,000

the sea has preserved, still waiting to be discovered.

492

00:42:08,000 --> 00:42:11,000

you