

1

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

Can explosive new evidence prove that one of the worst maritime disasters in recent

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00:00:07,600 --> 00:00:11,040

years was no accident?

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00:00:11,040 --> 00:00:17,280

All they can find are lifeboats and people terrified in the water.

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00:00:17,280 --> 00:00:23,080

Does the answer to one of America's most iconic aviation mysteries lie hidden in a mighty

5

00:00:23,080 --> 00:00:24,520

river?

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00:00:24,520 --> 00:00:31,920

What happened to Cooper and the \$200,000 of cold cash?

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00:00:31,920 --> 00:00:37,400

And what are the bizarre growths on the deep ocean floor said to be worth trillions of

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00:00:37,400 --> 00:00:38,400

dollars?

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00:00:38,400 --> 00:00:44,240

They have enough rare metals to supply civilization for thousands of years.

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00:00:44,240 --> 00:00:45,240

What are they?

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00:00:45,240 --> 00:00:50,120

How did they get there?

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00:00:50,120 --> 00:00:54,720

The underwater realm is another dimension.

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00:00:54,720 --> 00:01:04,720

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

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00:01:04,720 --> 00:01:10,440

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

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00:01:10,440 --> 00:01:15,000

underwater mysteries known to science.

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00:01:15,000 --> 00:01:21,000

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

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00:01:21,000 --> 00:01:26,160

It's a dangerous frontier that swallows evidence.

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00:01:26,160 --> 00:01:28,680

You have nowhere to run.

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00:01:28,680 --> 00:01:34,200

Where unknown is normal and understanding is rare.

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00:01:45,000 --> 00:01:55,440

When disaster strikes at sea, even the most exhaustive investigations sometimes fail to

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00:01:55,440 --> 00:01:57,600

get it right.

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00:01:57,600 --> 00:02:05,680

With 852 lives lost, the sinking of the passenger ferry MS Estonia is one of the worst civilian

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00:02:05,680 --> 00:02:10,280

sea disasters after the loss of the Titanic.

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00:02:10,280 --> 00:02:18,120

Now, will modern underwater technology deployed by a daring team of investigators overturn

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00:02:18,120 --> 00:02:26,800

the official version of events?

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00:02:26,800 --> 00:02:30,320

September 28th, 1994.

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00:02:30,320 --> 00:02:36,080

It's the dead of night and cruise ferry MS Estonia is making a routine crossing of the

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00:02:36,080 --> 00:02:40,160

Baltic Sea.

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00:02:40,160 --> 00:02:45,040

Taking almost a thousand passengers, she's five hours into her journey from Tallinn,

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00:02:45,040 --> 00:02:50,760

Estonia to Stockholm in Sweden.

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00:02:50,760 --> 00:02:54,960

Storm winds are creating 20-foot high waves.

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00:02:54,960 --> 00:03:00,920

But the conditions aren't out of the ordinary for the 515-foot-long ship.

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00:03:00,920 --> 00:03:05,960

It has made countless crossings across the Baltic in very stormy conditions.

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00:03:05,960 --> 00:03:09,520

The journey on this particular day was nothing special.

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00:03:09,520 --> 00:03:11,640

The Estonia is a huge ship.

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00:03:11,640 --> 00:03:17,280

It's bigger than 12 buses or two-thirds the length of Titanic.

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00:03:17,280 --> 00:03:26,760

But shortly after 1am, the Estonia is in deep trouble.

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00:03:26,760 --> 00:03:31,680

The third officer reports that the ship is leaning dangerously to one side.

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00:03:31,680 --> 00:03:52,400

Then, in a dramatic worsening of events, a total blackout.

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00:03:52,400 --> 00:03:56,280

The ship loses all its lights, all its power.

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00:03:56,280 --> 00:04:02,960

But amazingly, the third officer is able to still read the coordinates on the battery-operated

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00:04:02,960 --> 00:04:08,240

equipment.

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00:04:08,240 --> 00:04:14,360

Nearby vessels race towards the Estonia's coordinates.

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00:04:14,360 --> 00:04:17,920

But they're too late.

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00:04:17,920 --> 00:04:23,240

The ferry vanishes below the waves in a matter of minutes.

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00:04:23,240 --> 00:04:26,960

It's a shocking and inexplicable event.

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00:04:26,960 --> 00:04:29,400

How could this have happened?

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00:04:29,400 --> 00:04:32,680

Is it possible something sinister is at play?

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00:04:32,680 --> 00:04:38,440

All they can find are lifeboats and people terrified in the water.

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00:04:38,440 --> 00:04:43,440

It's the Baltic and it's very, very cold and these people are really in the last minutes

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00:04:43,440 --> 00:04:46,960

of hypothermia and are close to drowning.

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00:04:46,960 --> 00:04:52,880

Rescuers work through the night to pull survivors from the water, but hundreds of passengers

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00:04:52,880 --> 00:04:54,000

are missing.

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00:04:54,000 --> 00:05:00,760

Of the 989 passengers on board, only 138 are rescued.

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00:05:00,760 --> 00:05:06,280

No one understands how or why a ship this size could sink so quickly.

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00:05:06,280 --> 00:05:10,040

It's unprecedented in modern maritime history.

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00:05:10,040 --> 00:05:14,320

In all, 852 lives are lost in the tragedy.

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00:05:14,320 --> 00:05:20,040

The sinking of the Emma Estonia was completely unexpected and out of the ordinary.

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00:05:20,040 --> 00:05:25,280

Even the previous reliability of this ferry, it's shocking that it would sink in these

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00:05:25,280 --> 00:05:27,360

conditions.

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00:05:27,360 --> 00:05:32,400

What happened on that fateful night to cause one of the worst maritime disasters of the

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00:05:32,400 --> 00:05:33,400

20th century?

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00:05:33,400 --> 00:05:39,320

It's a question that many are still trying to answer.

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00:05:39,320 --> 00:05:44,480

And there's strong suspicion that this was no accident.

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00:05:44,480 --> 00:05:50,960

Two days after the sinking, a finished survey vessel finds the wreck using sonar.

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00:05:50,960 --> 00:05:55,720

The Estonia is found resting on a side in the depth of about 230 feet.

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00:05:55,720 --> 00:06:00,360

Plans are quickly made to get a closer look at the wreckage.

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00:06:00,360 --> 00:06:04,200

Investigators deploy two remotely operated submersibles.

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00:06:04,200 --> 00:06:08,440

The grainy black and white footage is difficult to analyse.

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00:06:08,440 --> 00:06:12,760

But before long, officials uncover a clue.

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00:06:12,760 --> 00:06:16,720

The Estonia is missing its bow visor.

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00:06:16,720 --> 00:06:25,480

This is a critical piece of the front of the ship, but bizarrely, it's nowhere to be seen.

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00:06:25,480 --> 00:06:31,000

The Emma Estonia had been built to transport vehicles as well as passengers.

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00:06:31,000 --> 00:06:37,320

The bow would actually lift up and cars would drive inside the ship.

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00:06:37,320 --> 00:06:42,960

If this weak spot in the hull was compromised, could it explain how the Estonia went down

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00:06:42,960 --> 00:06:46,320

so quickly?

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00:06:46,320 --> 00:06:50,980

It takes salvagers two weeks to find the bow visor.

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00:06:50,980 --> 00:06:56,560

To their amazement, it's on the sea floor over one nautical mile from the Estonia.

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00:06:56,560 --> 00:06:59,660

Why is it so far from the wreck?

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00:06:59,660 --> 00:07:04,640

After raising it to the surface, investigators are confident that the damaged steel visor

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00:07:04,640 --> 00:07:07,080

is the cause of the disaster.

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

The official report found that because of the storm that the Estonia was in, the waves

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00:07:12,800 --> 00:07:18,120

had smashed into the bow and this had weakened the locking mechanism, ultimately ripping

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00:07:18,120 --> 00:07:20,440

it off.

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00:07:20,440 --> 00:07:26,280

While this explains why the bow visor was so far from the wreck, some refuse to believe

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00:07:26,280 --> 00:07:28,360

this version of events.

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00:07:28,360 --> 00:07:36,720

For a start, there was a strange noise just before the Estonia started sinking.

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00:07:36,720 --> 00:07:42,200

The officers reported hearing a loud bang just before the lights went out.

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00:07:42,200 --> 00:07:48,640

And according to others, the passenger ferry may have been carrying a secret military cargo.

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00:07:48,640 --> 00:07:52,640

My witnesses claim they saw military vehicles being loaded onto the vessel in the weeks

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00:07:52,640 --> 00:07:54,560

leading up to the disaster.

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00:07:54,560 --> 00:07:59,400

What were they carrying and was there an explosion?

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00:07:59,400 --> 00:08:05,760

The answer could point to a shocking act of sabotage and an international cover-up.

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00:08:05,760 --> 00:08:29,320

The only way to know for sure is to return to the wreck, 230 feet beneath the Baltic Sea.

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00:08:29,320 --> 00:08:35,400

The sinking of the passenger ferry MS Estonia cost 852 lives.

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00:08:35,400 --> 00:08:40,880

The official investigation claims rough seas weakened the ship's bow visor, causing it

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00:08:40,880 --> 00:08:42,520

to come loose.

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00:08:42,520 --> 00:08:48,760

But reports of covert military smuggling on board and rumors of an explosion have caused

99

00:08:48,760 --> 00:08:58,000

people to question the official narrative.

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00:08:58,000 --> 00:09:03,360

There are theories there was an explosion on the vessel because people heard a big, sharp

101

00:09:03,360 --> 00:09:05,360

bang.

102

00:09:05,360 --> 00:09:11,200

Is it possible that a secret military cargo exploded?

103

00:09:11,200 --> 00:09:15,360

Was the ship sabotaged by ex-Soviet forces?

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00:09:15,360 --> 00:09:23,680

Or, even more shocking, was the cause of the sinking closer to home?

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00:09:23,680 --> 00:09:29,520

Not long after the disaster, European officials put forward controversial plans to bury the

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00:09:29,520 --> 00:09:32,440

Estonia on the sea floor.

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00:09:32,440 --> 00:09:39,680

These decide that they actually want to entomb the wreck so that nobody can access the wreck.

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00:09:39,680 --> 00:09:43,520

And of course, this immediately raises suspicion.

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00:09:43,520 --> 00:09:48,500

The only motivation I can think of for entombing a shipwreck would be to cover up something

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00:09:48,500 --> 00:09:51,480

that had occurred before the ship sank.

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00:09:51,480 --> 00:09:56,520

Fortunately, the entombing is stopped after a backlash from victims' families.

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00:09:56,640 --> 00:10:05,040

Instead, authorities declare the site a grave, prohibiting anyone from approaching it.

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00:10:05,040 --> 00:10:10,760

If people want to go visit this wreck site to honour their lost loved ones, why should

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00:10:10,760 --> 00:10:15,040

that be stopped?

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00:10:15,040 --> 00:10:20,140

Some are still determined to uncover the truth.

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00:10:20,140 --> 00:10:26,080

And in 2019, two Swedish filmmakers hatch a daring plan.

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00:10:26,080 --> 00:10:31,760

They approach the wreck site in defiance of the law and patrolling vessels.

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00:10:31,760 --> 00:10:36,920

They deploy a high-tech underwater drone, far more advanced than the equipment available

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00:10:36,920 --> 00:10:40,240

in 1994 when the ship sank.

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00:10:40,240 --> 00:10:46,520

These new ROVs have much higher resolution, so this allowed researchers to be able to

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00:10:46,520 --> 00:10:51,240

see the Estonia like it had never been seen before.

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00:10:51,240 --> 00:10:56,680

Using the video feed from the surface, they explore the outer perimeter of the Estonia.

123

00:10:56,680 --> 00:11:00,240

And it's not long before they make a shocking discovery.

124

00:11:05,240 --> 00:11:11,000

All of a sudden, they see this astonishing fact that there is a big hole in the ship,

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00:11:11,000 --> 00:11:13,320

a significant hole.

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00:11:13,320 --> 00:11:19,880

Estimates suggest the massive hole in the hull is 13 feet tall and 4 feet wide, straddling

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00:11:19,880 --> 00:11:23,480

the waterline on the starboard side.

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00:11:23,480 --> 00:11:28,880

This was a total surprise because it has never been reported that there is a hole in the

129

00:11:28,880 --> 00:11:30,600

ship's side.

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00:11:34,600 --> 00:11:39,960

In a bid to understand what could have created this gaping hole, Jorgen Amdahl was asked

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00:11:39,960 --> 00:11:42,360

to scrutinise the findings.

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00:11:42,360 --> 00:11:48,080

I am professor at the University of Science and Technology based in Trondheim, Norway.

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00:11:48,080 --> 00:11:56,320

We were asked to conduct an analysis of this damage and we made a model of the side.

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00:11:56,320 --> 00:12:01,040

The first observation Jorgen makes is that the force that ruptured the hull could not

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00:12:01,040 --> 00:12:04,720

have come from inside the ship.

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00:12:04,720 --> 00:12:10,400

The damage points inwards, so I am very convinced that it has been an external action that has

137

00:12:10,400 --> 00:12:11,400

caused it.

138

00:12:11,400 --> 00:12:15,480

And not, for example, an internal explosion.

139

00:12:15,480 --> 00:12:20,080

So it's possible that something struck the Estonia.

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00:12:20,080 --> 00:12:23,920

The force is equivalent to a collision with a freight train.

141

00:12:23,920 --> 00:12:27,800

What could have created such an immense impact?

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00:12:27,800 --> 00:12:34,320

Scans of the seabed reveal there are no rocks capable of gouging a hole this large.

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00:12:34,320 --> 00:12:39,240

If it is not due to something that happened on the seafloor, if there is something that

144

00:12:39,240 --> 00:12:45,440

hit it on the sea surface, then there is a different situation.

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00:12:45,640 --> 00:12:51,240

Some speculate that only one seafaring vessel could cause this type of damage without being

146

00:12:51,240 --> 00:12:55,280

detected.

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00:12:55,280 --> 00:12:59,160

A submarine.

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00:12:59,160 --> 00:13:01,480

There were no other ships nearby.

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00:13:01,480 --> 00:13:06,160

It's possible that a submarine may have actually ran into it.

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00:13:06,160 --> 00:13:09,920

There have been speculations about submarines.

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00:13:09,920 --> 00:13:10,920

We don't know.

152

00:13:10,920 --> 00:13:15,240

We don't know which object that could be.

153

00:13:15,240 --> 00:13:18,400

Why would a submarine strike the Estonia?

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00:13:18,400 --> 00:13:21,640

Were Russian forces unhappy with military smuggling?

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00:13:21,640 --> 00:13:28,920

Or was it a devastating maritime mistake that European powers are trying to cover up?

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00:13:28,920 --> 00:13:35,240

The hole found in the side of the wreck, at present, there is no known explanation for

157

00:13:35,240 --> 00:13:36,240

it.

158

00:13:36,240 --> 00:13:39,440

There are a lot of theories, but it still remains a mystery.

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00:13:39,440 --> 00:13:44,960

For now, there's no further evidence to confirm or rule out the theory that the Estonia was

160

00:13:44,960 --> 00:13:48,520

struck as she crossed the Baltic.

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00:13:48,520 --> 00:13:54,520

But for many, this previously unreported hole throws suspicion on the findings of the official

162

00:13:54,520 --> 00:13:56,240

investigation.

163

00:13:56,240 --> 00:14:00,080

This hole is completely unexplained.

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00:14:00,080 --> 00:14:08,480

One wonders if the authorities have something to hide.

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00:14:08,480 --> 00:14:14,120

The hole in the Estonia's hull raises more questions than it answers.

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00:14:14,120 --> 00:14:19,440

With demands growing for a new investigation, perhaps soon we'll get to the bottom of one

167

00:14:19,440 --> 00:14:33,840

of the world's most devastating ocean disasters.

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00:14:33,840 --> 00:14:42,080

In 2016, the FBI closes the file on one of the most infamous heists of all time.

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00:14:42,080 --> 00:14:48,360

DB Cooper's notorious jump from a hijacked plane has puzzled official investigators for

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00:14:48,360 --> 00:14:50,440

half a century.

171

00:14:50,440 --> 00:14:56,480

But now, have amateur sleuths found evidence that can finally solve one of America's most

172

00:14:56,480 --> 00:15:01,360

puzzling cold cases?

173

00:15:01,360 --> 00:15:09,200

November 24, 1971, a well-dressed man going by the name of Dan Cooper boards a Northwest

174

00:15:09,200 --> 00:15:16,320

Airlines flight in Portland, Oregon, bound for Seattle.

175

00:15:16,320 --> 00:15:20,200

Once in the air, Cooper hands the stewardess a note.

176

00:15:20,200 --> 00:15:24,680

There's a bomb in his briefcase.

177

00:15:24,680 --> 00:15:32,640

When they touch down, he exchanges the passengers for \$200,000 in cash and four parachutes.

178

00:15:32,640 --> 00:15:35,720

They have no idea what's going to happen.

179

00:15:35,760 --> 00:15:42,880

Cooper instructs the pilot and crew to fly south to Mexico so he can evade capture.

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00:15:42,880 --> 00:15:48,160

But not long into the flight, somewhere over the state line between Washington and Oregon,

181

00:15:48,160 --> 00:15:51,400

Cooper does the incredible.

182

00:15:51,400 --> 00:15:56,800

He jumps from the back of the plane with a parachute and his ransom money.

183

00:15:56,800 --> 00:16:00,720

This is the biggest skyjacking in US history.

184

00:16:00,720 --> 00:16:07,080

The plane lands safely, but what becomes of Cooper after his jump is a mystery that has

185

00:16:07,080 --> 00:16:11,640

perplexed and fascinated the world ever since.

186

00:16:11,640 --> 00:16:12,640

Did D.B.

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00:16:12,640 --> 00:16:14,520

Cooper fall to his death?

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00:16:14,520 --> 00:16:18,520

Did he escape, never to be seen or heard from again?

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00:16:18,520 --> 00:16:26,480

What happened to Cooper and the \$200,000 of cold cash?

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00:16:26,480 --> 00:16:30,120

Authorities launch a full-scale manhunt.

191

00:16:30,120 --> 00:16:33,600

The FBI do this huge search for D.B.

192

00:16:33,600 --> 00:16:34,600

Cooper.

193

00:16:34,600 --> 00:16:38,840

A hijacking in an airplane is not the best thing to do if you're a criminal because you

194

00:16:38,840 --> 00:16:43,480

are going to have the full power of the federal government come down on you.

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00:16:43,480 --> 00:16:48,880

Initial calculations place Cooper's landing zone in the area of the southernmost outreach

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00:16:48,880 --> 00:16:51,640

of Mount St. Helens.

197

00:16:51,640 --> 00:16:58,440

Not only is this a vast mountainous wilderness, it's also crisscrossed by mighty waterways.

198

00:16:59,440 --> 00:17:04,520

I've explored the Pacific Northwest.

199

00:17:04,520 --> 00:17:10,960

Its rivers are powerful and treacherous, and its forests populated with deadly bears.

200

00:17:10,960 --> 00:17:13,840

I think I'm going to make a graceful retreat.

201

00:17:13,840 --> 00:17:22,640

It's hard to imagine being dropped into this environment without any means of survival.

202

00:17:22,640 --> 00:17:28,360

They focus searches through the woods, boats on the lakes, up and down the rivers looking

203

00:17:28,360 --> 00:17:31,600

for any bits of evidence.

204

00:17:31,600 --> 00:17:37,720

Despite an extensive search, investigators come up empty-handed.

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00:17:37,720 --> 00:17:41,600

Cooper disappeared without a trace.

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00:17:41,600 --> 00:17:47,320

While public interest in the case never goes away, eight years pass without a significant

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00:17:47,320 --> 00:17:48,320

breakthrough.

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00:17:48,320 --> 00:17:55,720

Then, on February 10th, 1980, a chance discovery changes everything.

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00:17:55,720 --> 00:18:01,080

A young boy is building a campfire on the banks of the Columbia River.

210

00:18:01,080 --> 00:18:08,200

As he digs into the sand, he discovers three bundles of cash, totaling almost \$6,000.

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00:18:08,200 --> 00:18:14,720

His parents took that cash to the FBI, and it turns out that the serial numbers match

212

00:18:14,720 --> 00:18:18,080

the cash that was involved in the ransom.

213

00:18:18,080 --> 00:18:24,280

The discovery of the money could be the ticket to solving this enduring puzzle.

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00:18:24,280 --> 00:18:30,920

How more than 50 years on, can new cutting-edge scientific analysis of the cash finally tell

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00:18:30,920 --> 00:18:45,080

us what became of D.B. Cooper?

216

00:18:45,080 --> 00:18:52,440

The mystery of D.B. Cooper and his \$200,000 ransom takes a strange turn when some of the

217

00:18:52,720 --> 00:18:57,120

money is found on the banks of the Columbia River.

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00:18:57,120 --> 00:19:03,000

But despite this incredible breakthrough, the cash creates a new conundrum.

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00:19:03,000 --> 00:19:09,920

In terms of where the money was found, it was actually 18 miles away from the proposed

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00:19:09,920 --> 00:19:14,560

drop zone.

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00:19:14,560 --> 00:19:15,880

Investigators are puzzled.

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00:19:15,880 --> 00:19:20,600

How did the cash travel from the drop zone to the beach where it was found?

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00:19:20,600 --> 00:19:24,880

The leading theory is that it went on an epic river journey.

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00:19:24,880 --> 00:19:29,120

Initially they think the cash flowed into the Columbia River, but there's a problem

225

00:19:29,120 --> 00:19:30,840

with this.

226

00:19:30,840 --> 00:19:35,600

The cash could not have fallen into the Lewis River within the drop zone, because it joins

227

00:19:35,600 --> 00:19:41,280

the Columbia downstream of where the money was found.

228

00:19:41,280 --> 00:19:45,720

Some argue that the cash could have entered the Washougal River Valley to the east, washing

229

00:19:45,720 --> 00:19:48,960

into the Columbia and down to the beach.

230

00:19:48,960 --> 00:19:52,400

But there's a problem with this too.

231

00:19:52,400 --> 00:19:56,760

Experts don't believe that the cash could have remained so well preserved after such

232

00:19:56,760 --> 00:19:58,960

a journey.

233

00:19:58,960 --> 00:20:05,280

The bills still have rubber bands around them, and bundles of cash seem to be buried on top

234

00:20:05,280 --> 00:20:07,120

of each other.

235

00:20:07,120 --> 00:20:14,280

How were they all washed down river over months and stayed intact?

236

00:20:14,280 --> 00:20:20,440

Still no closer to answering what happened to D.B. Cooper and his cash, in 2016 the FBI

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00:20:20,440 --> 00:20:25,080

shuts down the investigation.

238

00:20:25,080 --> 00:20:31,480

In their place, a determined group of amateur sleuths keeps the search alive.

239

00:20:31,480 --> 00:20:37,600

In 2020 armed with an electron microscope, researcher Tom Kaye examines the bills in

240

00:20:37,600 --> 00:20:40,840

closer detail than ever before.

241

00:20:40,840 --> 00:20:46,000

And he finds a stoucing.

242

00:20:46,000 --> 00:20:50,000

So what new science have you been able to bring to this case?

243

00:20:50,000 --> 00:20:55,600

Under the microscope, we found this form of algae called diatoms.

244

00:20:55,600 --> 00:20:58,480

They're not the slimy algae you're used to seeing.

245

00:20:58,480 --> 00:21:05,080

The diatoms form a glass shell like a shoe box around each individual cell.

246

00:21:05,080 --> 00:21:08,440

Most rivers have dozens of species of diatoms.

247

00:21:08,440 --> 00:21:13,560

They die and fall to the bottom of the river, but the glass shell remains.

248

00:21:13,560 --> 00:21:18,680

So many years later we can pick them up and identify what species of diatoms are there

249

00:21:18,680 --> 00:21:20,200

in the river.

250

00:21:20,200 --> 00:21:26,680

Throughout the year, the types of diatoms in a river change depending on the season.

251

00:21:26,680 --> 00:21:33,680

Crucially, Tom detects a specific species that doesn't match the time of year that Cooper

252

00:21:33,680 --> 00:21:35,520

jumped.

253

00:21:35,520 --> 00:21:42,040

The particular type of diatom that we found on Cooper's cache was *Astrianella formosa*,

254

00:21:42,040 --> 00:21:49,120

a Latin name, but that particular diatom is only found in the spring, not in November

255

00:21:49,120 --> 00:21:51,200

when Cooper jumped.

256

00:21:51,200 --> 00:21:55,200

The lack of winter diatoms indicates that the money couldn't have become submerged in

257

00:21:55,200 --> 00:22:00,160

November when the hijack happened, suggesting a significant time delay between Cooper's

258

00:22:00,160 --> 00:22:04,800

jump and his cache getting exposed to river water.

259

00:22:04,800 --> 00:22:10,920

This tells us that the money spent at least six months somewhere other than getting buried

260

00:22:10,920 --> 00:22:15,960

where we don't know yet, but that's what adds to the mystery of the case.

261

00:22:15,960 --> 00:22:20,920

The money can't have been floating in the water after Cooper landed.

262

00:22:20,920 --> 00:22:26,280

The finding definitively rules out the theory that these bills came splashing down into

263

00:22:26,280 --> 00:22:30,640

a waterway with Cooper.

264

00:22:30,760 --> 00:22:31,800

That's not all.

265

00:22:31,800 --> 00:22:36,720

It removes any suspicion that Cooper landed on the ground and quickly buried some of

266

00:22:36,720 --> 00:22:39,760

the cache himself.

267

00:22:39,760 --> 00:22:44,400

Tom runs tests on \$20 bills.

268

00:22:44,400 --> 00:22:50,080

His research shows that the diatoms couldn't have entered the bills once the bills were

269

00:22:50,080 --> 00:22:51,520

in the ground.

270

00:22:51,520 --> 00:22:56,480

The cache is submerged in the water months after Cooper jumped.

271

00:22:56,480 --> 00:22:59,960

Somehow, it winds up buried in the ground.

272

00:22:59,960 --> 00:23:03,800

This research creates a new riddle in the Cooper mystery.

273

00:23:03,800 --> 00:23:07,120

Why was there this strange time delay?

274

00:23:07,120 --> 00:23:09,560

How did the cache get buried?

275

00:23:09,560 --> 00:23:16,680

It's like Cooper is still messing with us more than 50 years after this event.

276

00:23:16,680 --> 00:23:22,440

While new evidence often helps to rule out long-held theories, this time it widens the

277

00:23:22,440 --> 00:23:24,160

mystery.

278

00:23:24,160 --> 00:23:29,920

People will never stop trying to solve the Cooper case, but now experts realise the answer

279

00:23:29,920 --> 00:23:33,040

may lie beneath the surface.

280

00:23:38,680 --> 00:23:45,480

The AE-1, Australia's first ever submarine, disappears at the start of World War One.

281

00:23:45,480 --> 00:23:51,480

It's the only naval vessel in the nation's history whose whereabouts remain unknown.

282

00:23:51,480 --> 00:23:59,880

Can a dedicated team uncover how the AE-1 vanished without leaving a trace?

283

00:23:59,880 --> 00:24:03,400

September 14th, 1914.

284

00:24:03,400 --> 00:24:11,320

What's now Papua New Guinea is divided into British and German-held territories.

285

00:24:11,320 --> 00:24:17,920

Australia's flagship submarine AE-1 is on patrol, scouting for German warships.

286

00:24:17,920 --> 00:24:21,080

World War One has just begun.

287

00:24:21,080 --> 00:24:26,880

The Australians are part of the British Empire and Australian resources are brought into

288

00:24:26,880 --> 00:24:29,480

the war effort.

289

00:24:29,480 --> 00:24:37,720

With 35 crew on board, the AE-1 patrols alongside the torpedo boat HMAS Paramata.

290

00:24:37,720 --> 00:24:43,480

The two vessels plan to rendezvous at 6pm once their watch is over.

291

00:24:43,480 --> 00:24:50,280

But at 3.20, the Paramata's crew loses sight of the submarine.

292

00:24:50,280 --> 00:24:56,560

The Paramata immediately tried to make contact with AE-1 by radio using Morris code, but

293

00:24:56,560 --> 00:24:59,200

was unable to make contact with it.

294

00:24:59,200 --> 00:25:03,440

By 8pm, there's still no sign of AE-1.

295

00:25:03,440 --> 00:25:07,920

Was she spotted and engaged by the enemy?

296

00:25:07,920 --> 00:25:12,640

Or did she get into trouble navigating around the area's many islands?

297

00:25:12,640 --> 00:25:16,720

In 1914, there was no radar.

298

00:25:16,720 --> 00:25:18,840

They didn't have technology like sonar.

299

00:25:18,840 --> 00:25:21,600

They didn't have any beacons like we do today.

300

00:25:21,600 --> 00:25:25,160

So basically you're looking for a needle in a haystack.

301

00:25:25,160 --> 00:25:29,040

The Australians searched for the vessel for three days.

302

00:25:29,040 --> 00:25:33,880

If any of the sailors remained alive on the submarine, by that time the oxygen would have

303

00:25:33,880 --> 00:25:38,480

been used up just through breathing.

304

00:25:38,480 --> 00:25:48,640

With no bodies and no debris found, AE-1 is declared lost at sea.

305

00:25:48,640 --> 00:25:54,360

For Australia, losing this iconic symbol of their emerging naval strength is a tragic

306

00:25:54,360 --> 00:25:58,920

blow, but it's also a perplexing mystery.

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00:25:58,920 --> 00:26:04,880

AE-1's commander was known for having a spotless record at sea.

308

00:26:04,880 --> 00:26:11,000

And of all the vessels lost in the Navy's history, AE-1 is the only one still unaccounted

309

00:26:11,000 --> 00:26:12,640

for.

310

00:26:12,640 --> 00:26:18,760

This is a mystery that has haunted the Australian Navy for decades.

311

00:26:18,760 --> 00:26:24,560

After the course of a century, the search for AE-1 never truly stops.

312

00:26:24,560 --> 00:26:32,480

Twelve separate missions try and fail to find the sub and determine what happened.

313

00:26:32,480 --> 00:26:38,320

Then in 2017, a pioneering team armed with an autonomous underwater vehicle finally

314

00:26:38,320 --> 00:26:44,400

catches a break.

315

00:26:44,400 --> 00:26:50,080

Sea bed scans show a distinctive shape on the seafloor at a depth close to a thousand

316

00:26:50,080 --> 00:26:51,080

feet.

317

00:26:51,080 --> 00:26:53,400

It's the AE-1.

318

00:26:53,400 --> 00:26:57,760

This is the first sighting of the submarine since she disappeared over a hundred years

319

00:26:57,760 --> 00:26:59,200

ago.

320

00:26:59,200 --> 00:27:03,880

Not only is she sitting upright, the sub is in one piece.

321

00:27:03,880 --> 00:27:07,320

It turns out that the hull of the submarine was more or less intact.

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00:27:07,320 --> 00:27:10,840

There was no sign of a debris field around it whatsoever.

323

00:27:10,840 --> 00:27:14,720

No bodies or wreckage was found outside of the submarine.

324

00:27:14,720 --> 00:27:17,800

It was completely in one piece.

325

00:27:17,800 --> 00:27:23,160

To some, this is a clear indication that AE-1 wasn't attacked.

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00:27:23,160 --> 00:27:28,000

But despite finally finding her, we still don't know what happened.

327

00:27:28,000 --> 00:27:29,400

There is no enemy action.

328

00:27:29,400 --> 00:27:32,400

How does this submarine go down?

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00:27:41,680 --> 00:27:51,560

After twelve failed missions, in 2017 the Australian submarine AE-1 is finally found.

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00:27:51,560 --> 00:27:57,960

But why she sank with all 35 hands lost is still a mystery.

331

00:27:57,960 --> 00:28:04,040

Sonar images reveal that she's sitting upright at a depth of around 1,000 feet.

332

00:28:04,040 --> 00:28:10,280

Bizarrely, there are no clear signs she was attacked.

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00:28:10,280 --> 00:28:18,160

If we can examine it, look at it, we may be able to discover what went wrong.

334

00:28:18,160 --> 00:28:26,080

During the 2017 expedition, the only underwater camera the team have is tethered to a winch.

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00:28:26,080 --> 00:28:30,720

It limits them to a top-down view of the wreckage.

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00:28:30,720 --> 00:28:35,400

But it's enough to reveal a vital clue.

337

00:28:35,400 --> 00:28:41,480

Several fins called hydroplanes that control the submarine's pitch are set in what's called

338

00:28:41,480 --> 00:28:44,480

the Hard to Rise position.

339

00:28:44,480 --> 00:28:51,320

That indicates there was a desperate attempt by the captain to get the submarine to the surface.

340

00:28:51,320 --> 00:28:57,280

More importantly, it reveals that AE-1 had executed a dive.

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00:28:57,280 --> 00:29:03,040

It's a strange manoeuvre for a submarine that's only on a scouting mission.

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00:29:03,120 --> 00:29:07,200

Theoretically, there's no real need for them to dive deep below the surface.

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00:29:07,200 --> 00:29:15,000

Could it be that the submariners on AE-1 spotted an enemy vessel and is that why they dived to greater depths?

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00:29:15,000 --> 00:29:17,640

Was the dive a training exercise?

345

00:29:17,640 --> 00:29:25,000

We know the crew was trying to train up and were hoping to be deployed to a more active theatre of conflict soon.

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00:29:25,000 --> 00:29:31,680

They could well have been putting themselves through some very, very hard training to get themselves ready.

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00:29:31,680 --> 00:29:39,680

In order to truly lay this mystery to rest, the team must figure out what went wrong.

348

00:29:39,680 --> 00:29:44,680

In 2018, they go in for a closer look.

349

00:29:44,680 --> 00:29:50,680

Could this be their chance to solve the 100-year-old mystery?

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00:29:50,680 --> 00:29:56,680

Before long, the wreck of AE-1 comes into sharp focus.

351

00:29:56,680 --> 00:30:01,680

The first ROV sighting on HMAS-21.

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00:30:01,680 --> 00:30:05,680

100 for three years in the making.

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00:30:05,680 --> 00:30:14,680

The footage reveals for the first time the devastating forces that would have killed AE-1's 35 crew members.

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00:30:14,680 --> 00:30:20,680

Researchers could see from the video that the forward section of the submarine had actually been crushed,

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00:30:20,680 --> 00:30:24,680

much like if you squeezed a soda can.

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00:30:24,680 --> 00:30:29,680

The submarine actually imploded.

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00:30:29,680 --> 00:30:35,680

Before long, video from the ROV reveals a small but highly significant clue,

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00:30:35,680 --> 00:30:39,680

an open vent above the sub's engine room.

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00:30:39,680 --> 00:30:44,680

Archaeologist Dr James Hunter is watching the feed from the surface.

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00:30:44,680 --> 00:30:52,680

As we're looking, we realize, wait a second, hold up, it looks like one of those might not be completely closed.

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00:30:52,680 --> 00:30:55,680

It might be, you know, partially open.

362

00:30:55,680 --> 00:31:02,680

This is something we weren't expecting at all, and we realized this was a really significant piece of the puzzle.

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00:31:02,680 --> 00:31:07,680

The vent may not look like much, but if left open when the submarine dived,

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00:31:07,680 --> 00:31:11,680

it would have caused a catastrophic ingress of water.

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00:31:11,680 --> 00:31:17,680

It no doubt short-circuited the electric engines, shutting them off.

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00:31:17,680 --> 00:31:22,680

And as that water enters the submarine, it starts to create more weight in the stern,

367

00:31:22,680 --> 00:31:27,680

and that causes the submarine to start to sink by the stern.

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00:31:27,680 --> 00:31:34,680

We suspect around 300 feet, the hull could no longer withstand the external water pressure,

369

00:31:34,680 --> 00:31:37,680

and the front end of the submarine imploded.

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00:31:37,680 --> 00:31:44,680

We now know how sub-AE-1 met its end, but why the valve was left open is still unsolved.

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00:31:44,680 --> 00:31:50,680

It could have been one of the crewmen forgetting to close it, and then realizing too late,

372

00:31:50,680 --> 00:31:53,680

or it could have been something like a piece of debris.

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00:31:53,680 --> 00:31:58,680

Whether it was human error or sheer bad luck may one day be answered.

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00:31:58,680 --> 00:32:02,680

For many, though, the most important mystery is solved.

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00:32:02,680 --> 00:32:09,680

The AE-1 and a 35 Brave Submariners are found and not forgotten.

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00:32:15,680 --> 00:32:24,680

In a world of dwindling natural resources, could the answer to our future renewable energy needs

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00:32:24,680 --> 00:32:28,680

be hiding in the depths of our planet's oceans?

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00:32:28,680 --> 00:32:35,680

Potato-sized metallic nodules, which contain the materials to power electric cars,

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00:32:35,680 --> 00:32:41,680

cover vast areas of the ocean floor, and they're worth trillions of dollars.

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00:32:41,680 --> 00:32:45,680

When people think of what's valuable on the sea floor,

381

00:32:45,680 --> 00:32:51,680

they most often think of shipwrecks and valuable treasures like gold and silver.

382

00:32:51,680 --> 00:32:57,680

But what most people don't realize is there's something more valuable.

383

00:32:57,680 --> 00:33:05,680

Mining finite resources from the Earth can make or break a nation's fortunes and even start wars.

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00:33:05,680 --> 00:33:13,680

These nodules contain rare earth elements and some of the most precious metals known to humankind.

385

00:33:13,680 --> 00:33:19,680

But what exactly are they, and is it possible to turn them to our advantage?

386

00:33:19,680 --> 00:33:24,680

The world is changing.

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00:33:24,680 --> 00:33:29,680

As we transition to sustainable power and a technology-driven society,

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00:33:29,680 --> 00:33:35,680

the demand for precious metals mined from the Earth is at an all-time high.

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00:33:35,680 --> 00:33:39,680

But there is an alternative.

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00:33:39,680 --> 00:33:45,680

Deep beneath the ocean, in the dark realm that's almost totally unexplored by humans,

391

00:33:45,680 --> 00:33:54,680

there's a mysterious crop of black potato-sized objects named polymetallic nodules.

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00:33:54,680 --> 00:34:00,680

Scientists think these so-called nodules are millions of years old.

393

00:34:00,680 --> 00:34:04,680

But what's the difference?

394

00:34:04,680 --> 00:34:09,680

Scientists think these so-called nodules are millions of years old.

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00:34:09,680 --> 00:34:14,680

And there could be over 500 billion tonnes of them on the sea floor.

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00:34:14,680 --> 00:34:24,680

What's more, they're loaded with highly valuable resources.

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00:34:24,680 --> 00:34:32,680

Individual nodules are first discovered by early ocean explorers in the 1870s.

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00:34:32,680 --> 00:34:34,680

They didn't know what they were.

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00:34:34,680 --> 00:34:43,680

They didn't have any feel for whether this was something created by an organism or whether it was just a rock.

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00:34:43,680 --> 00:34:53,680

Examining them reveals strange tree-like rings inside that suggest these small, mysterious objects are somehow growing

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00:34:53,680 --> 00:35:00,680

and that they contain concentrations of the precious metal manganese.

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00:35:00,680 --> 00:35:07,680

But without the scientific tools to investigate further, these unexplainable curiosities are filed

away

403

00:35:07,680 --> 00:35:13,680

and forgotten for a hundred years.

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00:35:13,680 --> 00:35:21,680

It's not until 1974 that they are thrust back into the limelight in a very unexpected way.

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00:35:21,680 --> 00:35:28,680

When US intelligence reacts to intel of a Soviet submarine wrecked at the bottom of the Pacific,

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00:35:28,680 --> 00:35:32,680

1500 miles west of Hawaii.

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00:35:32,680 --> 00:35:40,680

In a bid to recover the sub and the Soviet secrets inside, the CIA launches a top-secret mission

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00:35:40,680 --> 00:35:45,680

involving iconic entrepreneur Howard Hughes.

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00:35:45,680 --> 00:35:56,680

They wrangled in this eccentric billionaire and they claimed together that what they were looking for instead of the sub was polymetallic nodules.

410

00:35:56,680 --> 00:36:04,680

The secret mission is a failure for the CIA who are unable to raise all of the sub from the sea floor.

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00:36:04,680 --> 00:36:10,680

The ocean mining cover story, however, is a remarkable success.

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00:36:10,680 --> 00:36:17,680

For the first time, scientists are able to examine the strange nodules in detail.

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00:36:17,680 --> 00:36:27,680

They find high concentrations of nickel, copper and cobalt and trace amounts of silicon, aluminum and titanium.

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00:36:27,680 --> 00:36:36,680

Now we know that these nodules are highly valuable because of the metals and the minerals that they contain.

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00:36:36,680 --> 00:36:44,680

And these are essential in today's modern technology, whether it's the car you drive or the cell phone that you use.

416

00:36:44,680 --> 00:36:54,680

The nodules are so plentiful it's said that if we mine only 10% they'd keep the world supplied with key metals for thousands of years.

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00:36:54,680 --> 00:37:02,680

In one part of the Pacific Ocean alone, estimates of their worth run from 8 to more than 16 trillion dollars.

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00:37:02,680 --> 00:37:15,680

As worldwide economies transition from using fossil fuels to more modern technologies, these metals are going to become increasingly important.

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00:37:15,680 --> 00:37:22,680

This untapped underwater gold mine has the potential to transform the global economy.

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00:37:22,680 --> 00:37:32,680

But scientists still don't understand what these nodules are or how they've seemingly grown on the seabed since before humans walked the earth.

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00:37:32,680 --> 00:37:43,680

The mystery is how these nodules actually form. Are they biological? Are they an animal? Are they geological? Are they a rock?

422

00:37:43,680 --> 00:37:50,680

Could unlocking the secret of these mysterious nodules be the key to our technological future?

423

00:37:52,680 --> 00:38:12,680

In a remote part of the Pacific Ocean, a vast and mysterious crop of black nodules is said to be worth trillions of dollars.

424

00:38:12,680 --> 00:38:18,680

But what are they and why do they seem to grow at impossible depths?

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00:38:18,680 --> 00:38:33,680

In addition to these nodules being very valuable, they're also very precious because on average they grow one centimeter per million years.

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00:38:33,680 --> 00:38:47,680

During X-ray examination in the 1970s, scientists discovered that the growth rings in the center of these mysterious nodules often formed around a piece of organic matter, like a shark's tooth.

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00:38:47,680 --> 00:39:00,680

The deep ocean is a highly pressurized broth of dissolved metals and minerals. One theory is that some unknown microbial process draws them towards the tooth.

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00:39:00,680 --> 00:39:07,680

The theory is that shark teeth act as a catalyst to cause these minerals to precipitate out.

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00:39:07,680 --> 00:39:17,680

It's an astonishing thought. The metal nodules that could change the fortunes of humanity are the remains of a shark tooth graveyard.

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00:39:17,680 --> 00:39:30,680

Now, one might ask how many shark teeth can there possibly be on the seafloor? But the reality is, some species of shark shed over 35,000 teeth over the course of their life.

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00:39:30,680 --> 00:39:41,680

So if one shark can shed 35,000 teeth, imagine how many shark teeth there must be at the bottom of the ocean.

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00:39:41,680 --> 00:39:49,680

In another bizarre twist, scientists can't explain why or how the nodules stay visible on the

seafloor.

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00:39:49,680 --> 00:39:54,680

Over millions of years, ocean sediments should bury them out of sight.

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00:39:55,680 --> 00:40:04,680

You would still expect sediment to be drifting through the water column and gently covering these nodules, but that doesn't seem to be the case.

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00:40:05,680 --> 00:40:14,680

Somehow this ancient deep ocean crop remains exposed on the seafloor. It's a mystery that continues to stump scientists.

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00:40:14,680 --> 00:40:30,680

Some researchers have theorized that starfish or other invertebrates who live on the seafloor might be constantly clearing the seafloor sediment off of the polymetallic nodules, thus leaving them exposed on the seafloor for thousands, if not millions of years.

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00:40:33,680 --> 00:40:41,680

Although the nodules are still shrouded in mystery, the technology to harvest them from the seafloor now exists.

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00:40:42,680 --> 00:40:51,680

Today, deep sea mining companies are in a race to perfect the machines that will raise the nodules from the ocean floor on an industrial scale.

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00:40:52,680 --> 00:41:02,680

At the moment, no one on the planet has the right to extract minerals from the seafloor. However, licenses have been given to explore whether it might be feasible.

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00:41:03,680 --> 00:41:17,680

International authorities are scrambling to figure out how the spoils of this modern-day gold rush should be divided fairly. But many fear this race to the bottom could have devastating consequences.

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00:41:18,680 --> 00:41:25,680

Because for now, it's impossible to harvest the nodules from the seafloor without laying waste to the life around them.

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00:41:26,680 --> 00:41:34,680

There are an incredible amount of sea creatures down there that remain undiscovered, and the ones that are discovered are poorly understood.

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00:41:35,680 --> 00:41:42,680

We have to be careful that we don't cause other life forms to become extinct in the process.

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00:41:46,680 --> 00:41:53,680

We're still trying to find out how these mysterious natural treasures grow and how they stay visible on the seafloor.

445

00:41:55,680 --> 00:42:05,680

Meanwhile, as humans reach into the deep to fill their pockets, what will this mean for the future of our oceans and our world?