

1

00:00:30,000 --> 00:00:37,360

This Russian was in his youth one of the first men to gaze on the scene of perhaps the most

2

00:00:37,360 --> 00:00:42,080

awesome destruction ever wrought on the face of the earth, and he's lived with the riddles

3

00:00:42,080 --> 00:00:45,360

he found there ever since.

4

00:00:45,360 --> 00:00:53,280

Fifty years ago he set out by horse and sledge across the frozen wastes of Siberia to investigate

5

00:00:53,280 --> 00:00:57,880

the great catechism of Tunguska.

6

00:00:57,880 --> 00:01:04,200

Before on the morning of June 30th 1908 something came hurtling out of the sky, an enormous

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00:01:04,200 --> 00:01:09,800

ball of fire which exploded above the Siberian forest with a sound that was heard a thousand

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00:01:09,800 --> 00:01:15,480

miles away and a blast that laid waste the trees over an area the size of London and

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00:01:15,480 --> 00:01:23,400

New York put together.

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00:01:23,400 --> 00:01:30,880

For weeks afterwards the nights in Europe were almost as bright as day.

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00:01:30,880 --> 00:01:34,480

These pictures were taken after midnight.

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00:01:34,480 --> 00:01:39,640

A lifetime later the theories still abound about what it was that came out of the sky

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00:01:39,640 --> 00:01:41,360

that June day.

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00:01:41,360 --> 00:01:47,400

Was it a colossal meteorite, a black hole from interstellar space, an atomic bomb long

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00:01:47,400 --> 00:01:50,040

before such bombs were invented?

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00:01:50,040 --> 00:01:54,440

Could it even have been a spaceship?

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00:01:54,440 --> 00:02:00,600

A mystery from the files of Arthur C. Clarke, author of 2001 and inventor of the communication

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00:02:00,600 --> 00:02:03,520

satellite.

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00:02:03,520 --> 00:02:09,720

Now living in Sri Lanka he has studied the enigma of the great Siberian explosion.

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00:02:09,720 --> 00:02:19,400

So imagine that as I'm standing here that thing detonates five miles above us.

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00:02:19,400 --> 00:02:24,400

Well, there would have been a flash in the sky so brilliant that by comparison the sun

22

00:02:24,400 --> 00:02:27,080

is a feeble electric light bulb.

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00:02:27,080 --> 00:02:34,120

The flash of light and heat would have boiled the sea around us and set the city on fire

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00:02:34,120 --> 00:02:36,040

instantly.

25

00:02:36,040 --> 00:02:42,960

In the blast wave the concussion, you can't use the word sound, just a devastating pulverizing

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00:02:42,960 --> 00:02:48,160

concussion would have flattened all the buildings except possibly the one immediately beneath

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00:02:48,160 --> 00:02:54,000

the explosion which might have stayed upright as indeed in Hiroshima buildings directly

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00:02:54,000 --> 00:02:57,400

under the center of detonation remain standing.

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00:02:57,400 --> 00:03:03,320

But what we're talking about now is something one thousand times more devastating than the

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00:03:03,320 --> 00:03:05,320

first atom bomb in Hiroshima.

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00:03:34,320 --> 00:03:39,760

More than 70 years after the great Siberian explosion the scientists still come together

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00:03:39,760 --> 00:03:42,960

to puzzle over that catastrophic event in 1908.

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00:03:42,960 --> 00:03:50,040

Dr. Nikolay Vasiliyev and Professor Alexander Dolgov have flown in from Tomsk and Novosibirsk

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00:03:50,040 --> 00:03:53,520

to meet at the Soviet Academy of Sciences.

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00:03:53,520 --> 00:03:59,680

Professor Yavnoi comes from the meteorite committee of the USSR and Dr. Leonid Khrinov,

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00:03:59,680 --> 00:04:11,120

one of the first scientists to reach the site is still active.

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00:04:11,120 --> 00:04:16,960

The discussions go on because to this day they are still not sure what happened in the depths

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00:04:16,960 --> 00:04:23,040

of the Siberian wilderness on that June morning.

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00:04:23,040 --> 00:04:28,720

The investigation into the mystery of the Siberian explosion began in 1921 just after

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00:04:28,760 --> 00:04:30,320

the Russian Revolution.

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00:04:30,320 --> 00:04:34,720

The Academy of Sciences was one of the first institutions to be set up by the Bolsheviks

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00:04:34,720 --> 00:04:37,200

in Petrograd, now Leningrad.

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00:04:37,200 --> 00:04:42,040

And it was decided that the new scientific socialism should also be in the vanguard of

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00:04:42,040 --> 00:04:49,560

the natural sciences.

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00:04:49,560 --> 00:04:54,320

The Academy gave a commission to a young scientist called Leonid Kulik to investigate

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00:04:54,320 --> 00:04:58,680

the falls of meteorites on the territory of the USSR.

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00:04:58,680 --> 00:05:04,360

A friend showed Kulik an eyewitness story on the back of an old calendar, his first hint

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00:05:04,360 --> 00:05:08,960

of the extraordinary happening 13 years before in 1908.

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00:05:08,960 --> 00:05:10,760

It was a strange time.

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00:05:10,760 --> 00:05:15,840

Far away in England, the Daily Express of July 3rd, 1908 reported the weird happenings

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00:05:15,840 --> 00:05:18,440

of an already unusually hot summer.

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00:05:18,440 --> 00:05:23,240

It said, the extraordinary occurrence of night trains running over the Grampian Hills without

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00:05:23,280 --> 00:05:28,520

lights took place for the first time on record.

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00:05:28,520 --> 00:05:33,040

A golfer wrote to The Times saying it was light enough for play on the links at Brankester

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00:05:33,040 --> 00:05:35,160

in Norfolk at 11 p.m.

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00:05:35,160 --> 00:05:38,000

And he himself was aroused at 1.15 a.m.

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00:05:38,000 --> 00:05:42,320

and could read a book in his chamber quite comfortably.

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00:05:42,320 --> 00:05:46,840

This photograph of Whitkirk Church in Leeds was taken long after what should have been

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00:05:46,840 --> 00:05:49,080

dusk.

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00:05:49,080 --> 00:05:56,080

And this houseboat at Gloucester was snapped towards midnight.

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00:05:57,720 --> 00:06:04,720

What people took to be the northern lights lit up the whole east coast.

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00:06:06,080 --> 00:06:11,000

The Royal Meteorological Society reported an extreme shock in southern England, followed

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00:06:11,000 --> 00:06:18,000

by the vibrations of an air blast which travelled twice around the world.

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00:06:20,120 --> 00:06:25,120

Culek found similar evidence in the local press of Siberia.

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00:06:25,120 --> 00:06:32,120

The Tomsk paper thought a meteor had struck.

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00:06:35,120 --> 00:06:40,600

Armed with these few details, Culek set off on the Trans-Siberian Railway from Petrograd

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00:06:40,600 --> 00:06:46,520

across European Russia and half of Siberia to the small station of Tyshtet.

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00:06:46,520 --> 00:06:53,520

There he and his helpers left the train and set off towards the Angara River.

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00:07:01,560 --> 00:07:06,080

From there on they had only horse and boat to take them through the ice and snow of the

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00:07:06,080 --> 00:07:11,160

Siberian Forest, the Tiger.

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00:07:11,160 --> 00:07:16,320

There were endless river crossings made more hazardous by the spring thaw.

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00:07:16,320 --> 00:07:21,080

Eventually accompanied by the great Soviet cameraman Strukov, they reached the tiny trading

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00:07:21,080 --> 00:07:28,080

post of Vanavara.

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00:07:28,480 --> 00:07:33,520

The local people were fur traders, Mongols of the Ivanky tribe, with hunting territory

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00:07:33,520 --> 00:07:36,640

running up the Timbuska River.

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00:07:36,640 --> 00:07:42,400

It was now 20 years since they had experienced the extraordinary event of 1908, but as Dr.

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00:07:42,400 --> 00:07:49,400

Khrinov recalls they still had the most vivid memories.

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00:07:51,280 --> 00:07:54,960

Well there was Luchat Kansmyanov.

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00:07:54,960 --> 00:08:00,680

I questioned him and he told me in detail how he was held from his porch by the wave

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00:08:00,680 --> 00:08:02,240

of air.

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00:08:02,240 --> 00:08:07,720

He was literally thrown from his porch and he lost consciousness.

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00:08:07,720 --> 00:08:13,520

His daughter, a young girl, was at the time with her friend down by the stream and when

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00:08:13,520 --> 00:08:20,520

they heard the thunder and all the explosions they ran back home and saw him lying on the

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00:08:20,520 --> 00:08:24,720

ground.

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00:08:24,720 --> 00:08:30,440

Another eyewitness was on the far side of his hut, hammering something or other there.

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00:08:30,440 --> 00:08:37,440

So he was shielded by the hut from the place where the radiation came from.

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00:08:40,400 --> 00:08:45,520

But he felt that his ears had been scorched just as if he had walked into a hot, fiercely

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00:08:45,520 --> 00:08:47,480

heated steam bath.

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00:08:47,480 --> 00:08:52,000

His ears were scorched and he grabbed himself by the ears and ran inside.

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00:08:52,000 --> 00:08:59,000

Well by that time everything had already finished.

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00:09:00,880 --> 00:09:07,880

At Vanavara, Kulik's expedition set about building small boats which could take them

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00:09:12,960 --> 00:09:18,320

upriver towards the area where the locals said the explosion had happened.

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00:09:18,320 --> 00:09:23,040

There were many privations. Negotiating the rivers needed all the skills the local porters

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00:09:23,040 --> 00:09:28,520

could muster. At one point Kulik himself, with Stukov still filming, lost control of

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00:09:28,520 --> 00:09:33,040

his boat and was almost swept away.

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00:09:33,040 --> 00:09:37,720

It was the end of May before they made any significant progress. At one stage the porters

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00:09:37,720 --> 00:09:44,720

refused to go on towards a place they still viewed with some terror.

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00:09:58,520 --> 00:10:05,520

At last they reached the quieter waters of the Upper Tunguska and finally the junction

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00:10:12,240 --> 00:10:19,240

with the river Chombi.

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00:10:19,240 --> 00:10:26,240

From its southern bank they could see that the tops of all the trees had been sheared

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00:10:30,040 --> 00:10:35,400

off. They crossed the river and climbed through the battered forest to be confronted at the

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00:10:35,400 --> 00:10:42,400

top of a ridge by a chilling site.

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00:10:43,400 --> 00:10:49,400

As far as the eye could see the trees lay like an annihilated regiment in serried rows,

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00:10:50,160 --> 00:10:57,160

victims of some unimaginable slaughter.

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00:10:59,160 --> 00:11:06,160

The Taiga, the mighty Siberian Taiga, had everywhere been thick and without any clearing

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00:11:06,160 --> 00:11:13,160

or glades. But here we suddenly saw this place where the forest had been flattened

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00:11:14,400 --> 00:11:21,400

for many kilometers. The young trees that had grown after the event were still not very

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00:11:24,160 --> 00:11:31,160

tall and therefore they were covered by the snow. It was this that made the first and

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00:11:31,400 --> 00:11:38,400

strongest impression. We clearly saw the dimensions of the destruction. Of course this made a shattering

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00:11:45,760 --> 00:11:54,760

impression of Kulik, Krenov, Strukov and their helpers pressed on day after day through

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00:11:54,840 --> 00:12:00,040

the debris of bare and fallen trees. They had no idea how far they would have to go

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00:12:00,040 --> 00:12:07,040

to find the center of the devastation. They made camp, living as best they could with limited

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00:12:15,080 --> 00:12:22,080

supplies, off the land and the water. Though even fishing had its hazards.

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00:12:30,600 --> 00:12:37,600

Eventually, after fighting their way for more than 60 miles through the tangled mess of fallen

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00:12:39,040 --> 00:12:45,480

trees and new growth, they reached 20 years after the event the heart of the explosion.

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00:12:45,480 --> 00:12:51,240

Kulik was to call the place the Tunguska South Swamp, the center of 1000 square miles of

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00:12:51,240 --> 00:12:58,240

devastation. Convinced a meteorite must be the cause of the

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00:13:00,040 --> 00:13:06,520

cause, Kulik immediately began surveying the mosquito-ridden swamp. He thought that pieces

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00:13:06,520 --> 00:13:11,480

of the object which had caused such immense damage might be found in peculiar pits in

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00:13:11,480 --> 00:13:18,480

the swamp. His men drained the pits and excavated them without result.

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00:13:19,080 --> 00:13:26,080

This tree stump at the bottom of one hole was proof that this at least couldn't be a crater

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00:13:27,080 --> 00:13:33,080

caused by a meteor. Kulik persisted, but not a trace of a meteor was ever to be found.

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00:13:33,080 --> 00:13:38,080

Then the weather deteriorated.

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00:13:38,080 --> 00:13:45,080

So few provisions were left that I set off with one man to find the center of the devastation.

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00:13:49,080 --> 00:13:56,080

For the Vanavara trading post with squirrel skins to trade for money to buy food.

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00:14:02,440 --> 00:14:08,560

Kulik stayed behind with two men and he was forced to kill a dog to eat, though men with

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00:14:08,560 --> 00:14:15,560

supplies did eventually arrive.

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00:14:16,160 --> 00:14:23,160

I myself got frostbitten and the men who traveled with me also got frostbite in his feet and

129

00:14:24,280 --> 00:14:31,280

we were forced to go to the hospital at Kezhner where we spent two months.

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00:14:31,440 --> 00:14:38,440

Well what was the thing that detonated above the Siberian swamp in 1908?

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00:14:38,840 --> 00:14:44,000

We know end of theories. One is that it was a rather small lump of antimatter, perhaps

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00:14:44,000 --> 00:14:50,520

only a few pounds. Antimatter is material which has its atoms oppositely charged from

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00:14:50,520 --> 00:14:54,440

those of our ordinary terrestrial matter. So if a pound of antimatter meets a pound of

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00:14:54,440 --> 00:15:00,240

ordinary matter, the two annihilate each other giving a colossal explosion. The other is

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00:15:00,240 --> 00:15:05,040

that it was a very small black hole if such things exist. And that's a very small, perhaps

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00:15:05,040 --> 00:15:10,320

too small to be seen, but yet still weighing millions and millions of tons. Again if a

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00:15:10,320 --> 00:15:14,920

thing like that plowed into the earth it would go right through our planet and cause a colossal

138

00:15:14,920 --> 00:15:21,120

explosion at the point where it entered and the point where it went out. The remarkable

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00:15:21,120 --> 00:15:28,120

similarity between the Tungastka event and the after effects of the Hiroshima bomb has

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00:15:28,800 --> 00:15:33,960

prompted many people to suggest that it was some kind of nuclear explosion. The heat flash

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00:15:34,000 --> 00:15:39,480

was very similar. Trees at Tungastka were charred on the side towards the explosion,

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00:15:39,480 --> 00:15:43,600

but on the shadow side they were comparatively unaffected. Exactly the sort of thing that

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00:15:43,600 --> 00:15:50,600

happened at Hiroshima and Nagasaki. Well how could one have a nuclear explosion 40 years

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00:15:51,040 --> 00:15:57,720

before we had invented the atom bomb? Well perhaps a visitor from space had engine trouble

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00:15:57,720 --> 00:16:02,920

and tried to make a forced landing on our earth and didn't make it, but blew up five

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00:16:02,960 --> 00:16:08,040

miles above the surface. There's been at least one book written on this subject and a lot

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00:16:08,040 --> 00:16:15,040

of science fiction stories and it is a plausible theory and certainly a very romantic one.

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00:16:16,760 --> 00:16:21,600

But this romantic theory is still considered seriously by respectable scientists, particularly

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00:16:21,600 --> 00:16:28,600

in the Soviet Union. This is Soviet academician Alexei Zolotov. The Tungastka explosion took

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00:16:29,600 --> 00:16:36,600

place in the air. There exist only two possibilities for such an explosion. Either it came from an

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00:16:36,600 --> 00:16:42,600

internal energy source in the body or from the natural energy caused by its movement.

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00:16:42,600 --> 00:16:49,600

I believe it was a nuclear explosion from an artificially made object.

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00:16:50,600 --> 00:16:57,600

The spaceship theory was born after the atomic bomb explosions of the 40s and 50s. The devastation

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00:17:01,680 --> 00:17:07,040

caused by the bombs dropped on Japan was remarkably like that at Tungastka. The concrete

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00:17:07,040 --> 00:17:12,560

buildings at the center of the Nagasaki blast still stood upright, as did the trees at the

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00:17:12,560 --> 00:17:19,000

center of Tungastka. The charring of the trees, even signs of radiation at Tungastka, resembled

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00:17:19,000 --> 00:17:26,000

atomic bomb after effects. Kulik was killed by the Nazis during the Battle of Moscow.

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00:17:32,760 --> 00:17:37,520

And it was 1958 before the first post-war expedition was mounted. It was now possible

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00:17:37,520 --> 00:17:44,520

to get by air to Vanavara. But the team still had to use precarious and inadequate boats

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00:17:45,120 --> 00:17:52,120

and needed the help of the local reindeer herdsmen to carry their supplies. They also needed

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00:17:52,520 --> 00:17:59,520

plenty of determination before they were able to get back to Kulik's original site.

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00:18:07,120 --> 00:18:14,120

Although the new growth theory was not yet clear, the Tungastka explosion was not yet

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00:18:14,520 --> 00:18:21,520

clear. The mass in the tiger was now 50 years old. The devastation was still very plain.

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00:18:31,960 --> 00:18:36,960

Again there was the vile work of surveying and testing in the most impossible terrain,

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00:18:36,960 --> 00:18:43,960

assorted still by summer insects. Slowly the evidence built up, but there was still

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00:18:48,760 --> 00:18:55,760

no sign of any debris from the Tungastka blast, except for tiny globules of silica and metal.

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00:18:56,800 --> 00:19:02,840

Carefully packed to be sent back for analysis, they were to provide an important clue. There

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00:19:02,840 --> 00:19:08,460

were continuing echoes of a nuclear explosion. In the first place it was clear that the Tungastka

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00:19:08,460 --> 00:19:15,080

blast, like that at Hiroshima, had been an air burst. No one had thought of that in 1928.

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00:19:15,080 --> 00:19:21,980

But the Russians decided to check with a precise experiment. It was true. Whatever devastated

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00:19:21,980 --> 00:19:28,980

the tiger in 1908 had exploded about 8 kilometers, 5 miles, up in the air. Out in the forest

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00:19:29,980 --> 00:19:35,980

the researchers returning every year now by plane and helicopter and armed with sophisticated

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00:19:35,980 --> 00:19:42,980

equipment, found extraordinary genetic effects. There seemed to be several mutated species

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00:19:42,980 --> 00:19:49,980

of insects. And among the devastated skeletons of the trees, there were some which had survived.

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00:19:50,980 --> 00:19:57,980

When these were felled, the tree rings showed a dramatic increase in growth after 1908.

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00:19:57,980 --> 00:20:04,980

This effect had also appeared in Hiroshima. Whether or not this was due to nuclear radiation,

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00:20:04,980 --> 00:20:08,980

the man who today leads the yearly expeditions to the tiger, Nikolai Vasilyev, is certain

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00:20:08,980 --> 00:20:15,980

there is what he calls electromagnetic chaos. Right up to the present time we have been

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00:20:16,980 --> 00:20:23,980

investigating certain geophysical and biological effects which are not observed when normal

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00:20:24,980 --> 00:20:31,980

meteorites fall. In particular, the genetic pattern has been violated. This violation is

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00:20:31,980 --> 00:20:38,980

to be seen in certain species of plants and in particular in the pine trees. There is

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00:20:39,980 --> 00:20:44,980

certainly some new type of radiation here. The explosion of a cosmic body seems to have

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00:20:44,980 --> 00:20:51,980

produced this new type of radiation field on the ground at the center of the blast.

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00:21:01,980 --> 00:21:06,980

The discussion continues among the experts and volunteers at the annual summer camps.

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00:21:07,980 --> 00:21:11,980

It has become apparent that the little globules they have collected contain elements that

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00:21:11,980 --> 00:21:18,980

could only have come from outer space. Slowly many scientists have come around to a theory

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00:21:18,980 --> 00:21:24,980

first proposed in the 30s by an Englishman, Frank Whipple, and dismissed then as far too

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00:21:24,980 --> 00:21:29,980

fanciful. His theory was that for the only time in all our knowledge the earth had been

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00:21:29,980 --> 00:21:39,980

struck by a comet. Comets are among the most romantic objects in the universe. Great shining

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00:21:40,980 --> 00:21:45,980

bodies with tails thousands of miles long, sweeping through the solar system and turning

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00:21:45,980 --> 00:21:51,980

around the sun, either to disappear forever or to return to our view only after many years.

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00:21:53,980 --> 00:21:57,980

But the comet theory doesn't convince academician Zolotov.

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00:21:59,980 --> 00:22:05,980

The main argument against it being a comet is the fact that the cosmic body was apparently

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00:22:05,980 --> 00:22:11,980

moving at such a slow speed. For it to be an explosion involving natural energy the body

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00:22:11,980 --> 00:22:17,980

would have to be moving extremely fast, in theory no less than 30 kilometers a second.

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00:22:18,980 --> 00:22:24,980

If the body had been a natural object moving at this great speed with a mass of a million

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00:22:24,980 --> 00:22:29,980

or more tons and a hundred meters across, then it would have uprooted the forest in a huge

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00:22:29,980 --> 00:22:35,980

strip more than a hundred kilometers across for a great distance before the actual explosion.

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00:22:36,980 --> 00:22:40,980

But Dr. Vassiliyev and his colleague Professor Alexander Dolgov, who did the chemical analysis

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00:22:40,980 --> 00:22:45,980

of the globules, feel the evidence now points most clearly to a comet.

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00:22:51,980 --> 00:22:56,980

We've got a large content of hydrogen which is a typical cosmic element.

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00:23:00,980 --> 00:23:06,980

Then we got quite large amounts of carbon dioxide which in its frozen state seems to make up the

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00:23:06,980 --> 00:23:12,980

heads of comets. We also got a certain quantity of hydrocarbons, probably methane.

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00:23:13,980 --> 00:23:18,980

This too is very characteristic of the structure of the front part of comets.

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00:23:18,980 --> 00:23:25,980

Now comets are associated with meteor streams, the sort of rivers of meteorites which flow

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00:23:25,980 --> 00:23:30,980

around the sun and intersect the Earth's orbit at regular intervals.

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00:23:30,980 --> 00:23:35,980

Another day I was going through a book on comets and meteors and I came across what I think is a

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00:23:35,980 --> 00:23:42,980

solution to this particular mystery. The stream of meteors known as the beta torrid,

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00:23:43,980 --> 00:23:49,980

the stream of meteors known as the beta torrid. They hit the Earth, the stream of meteors,

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00:23:50,980 --> 00:23:56,980

every 30th of June, the same day as the Tungusta event.

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00:23:57,980 --> 00:24:04,980

And I am pretty sure that the Tungusta explosion was something to do with the stream of meteorites,

212

00:24:05,980 --> 00:24:11,980

the beta torrid, every 30th of June. Inevitably something like Tunguska,

213

00:24:12,980 --> 00:24:17,980

will happen somewhere on the Earth. It could happen tomorrow, it could happen in the next five minutes.

214

00:24:18,980 --> 00:24:22,980

I would say it will certainly happen within the next thousand years.

215

00:24:23,980 --> 00:24:28,980

If it does happen fairly soon, and it isn't too large a comet, it might trigger a thermonuclear war

216

00:24:28,980 --> 00:24:35,980

because an explosion like that in any country could easily be mistaken for an attack by ICBMs.

217

00:24:36,980 --> 00:24:41,980

However, a very large comet, well I'm afraid it wouldn't leave anyone to worry about.

218

00:24:42,980 --> 00:24:49,980

At the end of every summer now, Dr. Vasiliev and his team with almost religious fervour

219

00:24:50,980 --> 00:24:57,980

watch the dawn in that still remote region of the Tunguska explosion in Siberia.

220

00:25:13,980 --> 00:25:22,980

Every year the Russians vow that they will return to seek a little more knowledge about the most awesome event

221

00:25:23,980 --> 00:25:27,980

which has ever struck this Earth in all the recorded history of man.

222

00:25:42,980 --> 00:25:47,980

Next week, the Riddle of the Stones.