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

Why did the people all of a sudden start to think that the people were the only ones who were not?

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00:00:10,000 --> 00:00:20,000

Why did the people all of a sudden start to think that the people were the only ones who were not?

3

00:00:21,000 --> 00:00:35,000

Why did the people of prehistoric Britain set up this great stone circle on Salisbury Plain?

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What is the meaning of stonehenge?

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00:00:42,000 --> 00:00:56,000

Were Britain's other rings of stone centres of an unknown pagan cult?

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00:00:56,000 --> 00:01:01,000

Were they places of sacrifice and death?

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00:01:01,000 --> 00:01:09,000

Were they observatories where 4,000 years ago astronomers plotted the courses of the sun, moon and stars?

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00:01:10,000 --> 00:01:13,000

Now, press the door.

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00:01:31,000 --> 00:01:38,000

Mysteries from the files of Arthur C. Clarke, author of 2001 and inventor of the communication satellite.

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00:01:38,000 --> 00:01:46,000

Now in retreat in Sri Lanka after a lifetime of science, space and writing, he ponders the riddles of this and other worlds.

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Everyone must feel awe, indeed reverence, at a place like stonehenge.

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00:01:52,000 --> 00:01:58,000

But these latter-day druids have no more right to be there than anyone else.

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Their association with stone circles is an invention of 18th century romantic writers.

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The druids flourished a thousand years after the completion of stonehenge.

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So to confuse them with stone circles is like mixing up the Battle of Britain and the Battle of Hastings.

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This is one of the few facts we do know about the thousand or so stone circles scattered over the British Isles.

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The

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00:02:57,000 --> 00:03:04,000

I'm standing amongst the 2,000-year-old ruins of Anuradapura, the ancient capital of Sri Lanka.

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The Romans sent their ambassadors here before the birth of Christ.

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00:03:09,000 --> 00:03:14,000

We know the exact history of this city because its builders left written records.

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00:03:14,000 --> 00:03:21,000

Indeed, we know what it looked like in its glory because its greatest shrines are now being restored.

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00:03:35,000 --> 00:03:42,000

By contrast, the hundreds of stone circles scattered over the British Isles are a complete mystery.

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00:03:42,000 --> 00:03:47,000

Their builders left no record of their thoughts or their motives.

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00:03:49,000 --> 00:03:54,000

More than a thousand circles and hengies have survived into modern times.

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00:03:54,000 --> 00:04:05,000

The power of their lingering magic has outlasted the rise and sometimes the ruin of Christianity.

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00:04:25,000 --> 00:04:29,000

These are empty places scattered over the British Isles.

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00:04:29,000 --> 00:04:33,000

The ground they stand on holds few clues to their purpose.

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00:04:37,000 --> 00:04:42,000

But in some circles the layout of the stones themselves may indicate the answer.

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00:04:42,000 --> 00:04:48,000

At Long Meg in Cumbria, the sun sets behind this megalith only on midwinter's day.

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00:04:48,000 --> 00:04:53,000

So did standing stones help to fix the calendar in prehistoric times.

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00:04:53,000 --> 00:05:00,000

Nowhere on earth is there more spectacular proof of ancient fascination with the changing skies than here.

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

This is New Grainge Tomb in Ireland.

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00:05:04,000 --> 00:05:08,000

Set on a hilltop above the River Boine, it is an almost unknown wonder.

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00:05:08,000 --> 00:05:11,000

Yet this is the oldest building in the world.

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00:05:12,000 --> 00:05:18,000

Faced with gleaming and immaculate quartz, it was built five centuries before the pyramids.

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00:05:18,000 --> 00:05:21,000

It is 5,000 years old.

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00:05:22,000 --> 00:05:26,000

THE END

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00:05:40,000 --> 00:05:49,000

Every year on one special day, New Grainge Tomb is a place of pilgrimage for the archaeologist who

restored it, Professor Michael O'Kelly.

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00:05:49,000 --> 00:05:57,000

He comes here in the pre-dawn darkness because this is December the 21st, the winter solstice, the shortest day of the year.

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00:05:58,000 --> 00:06:03,000

THE END

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00:06:15,000 --> 00:06:22,000

Professor O'Kelly began to unlock the secret of New Grange when he uncovered a strange slit above the door.

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At first its purpose baffled him.

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00:06:28,000 --> 00:06:33,000

The tomb has an inner chamber magnificently vaulted.

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00:06:33,000 --> 00:06:38,000

Oddly it contained the bones of just four adults and one child.

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00:06:41,000 --> 00:06:48,000

His hunch was that the slit above the door was to let the sun into the tomb to wake the spirits of the dead.

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00:06:48,000 --> 00:06:53,000

This would probably happen, he thought, at dawn on midwinter's day.

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00:06:54,000 --> 00:06:58,000

THE END

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00:07:08,000 --> 00:07:11,000

His hunch proved to be correct.

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00:07:11,000 --> 00:07:16,000

THE END

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00:07:20,000 --> 00:07:29,000

Through the slit on the shortest day of the year come the first rays of the sun as it rises above the ridge on the far side of the river Boine.

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00:07:29,000 --> 00:07:40,000

Michael O'Kelly will never forget the first time he witnessed the astounding phenomenon which the builders of New Grainge designed their Stone Age Cathedral to capture.

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00:07:41,000 --> 00:07:54,000

The first shot of orange-red light penetrated right to where I was sitting, gradually widened to a 17-centimeter band.

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00:07:54,000 --> 00:07:57,000

Illuminated the whole interior.

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00:07:57,000 --> 00:08:02,000

THE END

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00:08:05,000 --> 00:08:15,000

I could feel the spirits of the dead ha-ha round about me and I wondered if a voice shouldn't come and say something,

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00:08:15,000 --> 00:08:22,000

even if only to tell me to get the hell out of here, but nothing happened. Silence.

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00:08:23,000 --> 00:08:35,000

The band of light slowly crossed the floor and then a point came after 17 minutes, suddenly cut off, darkness.

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00:08:37,000 --> 00:08:45,000

How to explain it? I don't know, but quite obviously the builders of this place had taught the whole thing out,

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00:08:45,000 --> 00:08:52,000

and they had organized this slit so that it would be level with the local horizon,

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00:08:52,000 --> 00:09:03,000

and so that when the tip of the sun appears there's a horizontal line from the horizon through the slit right to the center of the floor.

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00:09:06,000 --> 00:09:10,000

The world's oldest building guards one of the world's oldest mysteries.

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00:09:10,000 --> 00:09:15,000

Perhaps people gathered here 5,000 years ago to commune with the spirits of the dead.

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00:09:15,000 --> 00:09:21,000

Perhaps this unique dawn marked the end of the old year, the beginning of the new.

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00:09:21,000 --> 00:09:29,000

Whatever the truth, the marvel of new Grange displays the central importance of the movements of the heavens to the builders of the ancient world.

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Far to the north in the Scottish Highlands, Dr Archie Tom believes he has proof that standing stones mark full-scale observatories used by prehistoric astronomers.

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00:09:47,000 --> 00:09:56,000

His theory, first suggested by his father and Oxford professor, is that the stones were aligned with distinctive features on the horizon.

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00:09:56,000 --> 00:10:01,000

In this case, a cleft in the hills, the Papps of Jura, 26 miles away.

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00:10:06,000 --> 00:10:12,000

The Tom's surveys suggested that the astronomers stood on this platform known to be man-made.

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00:10:12,000 --> 00:10:19,000

In an age when Scotland enjoyed fine weather, they could fix the date of the winter solstice by standing in line with the stone

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00:10:19,000 --> 00:10:23,000

and watching the sunset precisely in the cleft of the hills of Jura.

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00:10:26,000 --> 00:10:45,000

The Tom's believe ancient astronomers used observatories like this to fix their calendars for the business and ceremonial of their year.

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00:10:46,000 --> 00:10:55,000

A computer has already established what seemed to be dozens of astronomical alignments at Stonehenge.

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00:10:55,000 --> 00:11:08,000

But strange pits on the top of the Stonehenge lintels have inspired this American schoolmaster Richard Brinkerhoff to suggest an even more exotic astronomical theory.

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00:11:09,000 --> 00:11:16,000

He believes the ancient astronomers used the top of Stonehenge as a catwalk.

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00:11:20,000 --> 00:11:29,000

From there, with the help of sighting poles stuck into the pits, they could observe important developments in the cycles of the moon.

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00:11:30,000 --> 00:11:37,000

There are eleven pits altogether, probably, perhaps more obscured by later erosion.

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00:11:37,000 --> 00:11:49,000

These two particular holes, like all the others, were probably used as sights by people on top of the lintels yonder,

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00:11:49,000 --> 00:11:56,000

looking past them at moonrise on the distant horizon.

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00:11:57,000 --> 00:12:11,000

The northernmost point that the moon ever rises on the horizon, as seen from across the circle, is identified precisely by the farthest of these pits behind me,

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00:12:12,000 --> 00:12:16,000

above which the moon rises once every fifty-seven years.

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00:12:18,000 --> 00:12:33,000

The northernmost point that the sun rises is identified, seen by a man across the circle, is identified by the pit right there in front of me.

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00:12:33,000 --> 00:12:44,000

All of the pits between these two identify intermediate stages in the moon's motion northward along the horizon in those regions where the sunrise never occurs.

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00:12:44,000 --> 00:13:05,000

There's no doubt that some of these stone circles do have astronomical alignments, but this doesn't mean that their builders were skilled astronomers.

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00:13:06,000 --> 00:13:16,000

As for the other circles, the majority, well, perhaps there were no more than meeting places, the equivalent of the village hall, if you like.

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00:13:16,000 --> 00:13:22,000

We can't prove this because all these structures disappeared except for the basic stones.

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00:13:22,000 --> 00:13:28,000

Look at this forest of columns around me, known to every guest what this was.

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00:13:28,000 --> 00:13:37,000

In fact, these pillars were the foundations of a very tall building many stories high built about two thousand years ago, but all the wood has vanished,

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00:13:37,000 --> 00:13:46,000

so today it's impossible to guess what the original structure was like, and that may be the case with the still unexplained stone circles.

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00:13:46,000 --> 00:13:53,000

But the incredible scale of this circle at Avebury in Wiltshire almost defies modern explanation.

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00:13:53,000 --> 00:13:59,000

It covers twenty-eight and a half acres and encompasses a whole village.

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00:13:59,000 --> 00:14:11,000

In the ancient world some experts believe it must have been such a showpiece that Stonehenge with its weird arches was built later as a rival attraction.

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00:14:11,000 --> 00:14:17,000

Avebury must have been a massive undertaking. Its construction leaves archaeologists awestruck.

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00:14:23,000 --> 00:14:31,000

Dr. Aubrey Burr, the amazing thing is that places like Avebury and Stonehenge were built with tools as simple as this antler pick,

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00:14:31,000 --> 00:14:40,000

which I've just driven into the ground with a lump of stone, and the people who built these places would use tools like this to break up the chalk,

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00:14:40,000 --> 00:14:51,000

which lies underneath all this grass and earth, leave it out into huge blocks, and then having done that they'd take another very, very simple bit of equipment they had,

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00:14:51,000 --> 00:15:01,000

the shoulder blade of an ox, they'd use this to shovel up the chalk into wickerwork baskets, chalk which of course was as hard as rock.

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00:15:01,000 --> 00:15:07,000

It's not as soft as the sort of stuff we use in classrooms, it really is very, very hard.

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00:15:07,000 --> 00:15:24,000

They'd get it into a basket like this and then heft it up onto their shoulder, they'd carry this up the sides of the ditch to the bank where they'd dump load after load after load of it until the bank was 30 or 40 feet above them.

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00:15:24,000 --> 00:15:42,000

Now the amazing thing is that this ditch where I'm standing is only the top because when it was excavated just before the First World War, it was discovered that it's at least 18 to 20 feet deeper than this.

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00:15:43,000 --> 00:15:59,000

All this is just material that has fallen in over the last 4,000 years, and when the ditch was first dug it would have been shearsided, it was so steep in fact that the workers had to leave little steps in the chalk so they could lift the chalk up and out up to the ditch,

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00:15:59,000 --> 00:16:11,000

and it would have been so deep that had someone had a telegraph pole at the bottom, rising up here at the top would not have shown above the sides of the ditch, it's an incredible undertaking.

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00:16:11,000 --> 00:16:23,000

And it must have taken 50, 60 generations of people, people who would be born in the middle of the work, would work all their lives at it and yet would never see it finished.

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00:16:26,000 --> 00:16:39,000

And then inside the ditch were the great circles of stones. We know they were dragged several miles from the Marlborough Downs to Avesbury. The stones were carefully selected for size and shape.

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00:16:39,000 --> 00:16:50,000

When we look at a huge thing like this, it wasn't moved very easily, but what isn't obvious is the work that went on before they moved the stone because they couldn't just get hold of something like this and drag it.

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00:16:50,000 --> 00:16:59,000

First of all they had to make sledges, and they had to make sledges of oak or elm, something very, very tough and resilient. They would also need ropes.

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00:16:59,000 --> 00:17:12,000

Now they hadn't got the sort of rope or horse we have today, they'd have to kill hundreds and hundreds of cattle probably to flay their hides and wind them, bind them into very thick skeins of leather.

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00:17:12,000 --> 00:17:23,000

So there then we have a stone weighing 20, 30, perhaps as much as 60 tonnes on its ledge. And there are people dragging on these great leather ropes.

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00:17:23,000 --> 00:17:42,000

But for every tonne of stone weighs you need perhaps four people to drag on the ropes. And so for a stone like this, this is this 50, 60 tonne stone, you need at least 200 people dragging and hauling and the stone is moving almost imperceptibly.

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00:17:42,000 --> 00:18:01,000

Some of these stones have been re-erected in modern times. In 1934 for example, quite a small stone

was put upright. It only weighed 8 tonnes, yet it took 12 men, 5 days, using steel horses.

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00:18:01,000 --> 00:18:14,000

At circles like Castle Rig in Cumbria, the construction was easier, but the layout is often puzzling. Many seem to have been deliberately designed to be non-circular. Penman Moor in Wales is an ellipse.

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00:18:14,000 --> 00:18:29,000

Burrow Hill in Roxbrookshire is one of many shaped like an egg. Castle Rig itself is a flattened circle. Such precise patterns are repeated all over the country.

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00:18:29,000 --> 00:18:32,000

16.25 meters.

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00:18:33,000 --> 00:18:47,000

Studying this strange geometry is the hobby of Dr John Edwin Wood. For it's not a case of bad drawing. Oddly, the early rings are perfect circles. The juicing how Castle Rig was laid out is a challenge.

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00:18:47,000 --> 00:18:54,000

We think that this was laid out quite simply, starting with a number of equilateral triangles.

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00:18:54,000 --> 00:19:07,000

An equilateral triangle is very easy to produce on the ground. You start off with an open field, and you cut strings all of the same length, and then you pull them taught at the corners, and that gives you an equilateral triangle.

116

00:19:07,000 --> 00:19:27,000

This was built up with four equilateral triangles, with ropes and pegs like this. One, two, three, four, and they put a peg there, and a peg there, a peg here, and a peg here.

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00:19:27,000 --> 00:19:38,000

Well, we think that it was probably laid out like this. Now, this represents Castle Rig, and the stones are shown by the black blobs on the plan.

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00:19:38,000 --> 00:19:55,000

And these pins are the positions where they would have had to put the pegs in to lay out the stone circle. And we think they started with a rope from that pin, direct to this one, and then round to make the circumference of the circle start there.

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00:19:55,000 --> 00:20:08,000

And notice how it swings round to that one, and then it comes free to give you a circle of a different radius, and when you get to here, it catches up again on this one to make the other little arc.

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00:20:08,000 --> 00:20:21,000

And now the next thing that they would have done is to transfer the rope to that peg and complete

the rest of it by allowing it to swing round the centre peg all the way.

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00:20:22,000 --> 00:20:31,000

So that finally you get the full geometry of the Castle Rig ring without anything more elaborate than strings and pegs.

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00:20:35,000 --> 00:20:46,000

The stone circles of the British Isles are strange and need haunting places. Many of them have precise astronomical alignments, which must require great skill.

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00:20:47,000 --> 00:20:53,000

For others, the geometry is very obscure. We simply don't understand the motives of the designers.

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00:20:53,000 --> 00:21:01,000

But there are clues from this circle in Aberdeenshire that these places were indeed the cathedrals or temples of the ancient world.

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00:21:01,000 --> 00:21:05,000

Well, most of their local stones are from the Granite Fund.

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00:21:05,000 --> 00:21:15,000

Castle Fraser has been studied by Dr Aubrey Burl. There's an extraordinary feature in the Aberdeenshire circles, a great stone lying on its side flanked by two uprights.

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00:21:17,000 --> 00:21:24,000

Well, this stone is a recumbent. You can see why it's called that because it's just lying flat between these two huge stones.

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00:21:24,000 --> 00:21:28,000

One of the remarkable things about these stones is that they're absolutely horizontal.

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00:21:28,000 --> 00:21:33,000

If we put a spirit level on it just like that, look where the bubble comes right in the centre.

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00:21:33,000 --> 00:21:41,000

The people obviously have shifted and balanced these stones because they have bases that are shaped like this and they can be rocked to and fro until they're absolutely level.

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00:21:41,000 --> 00:21:44,000

Then they bang these huge chalk stones in underneath.

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00:21:45,000 --> 00:21:50,000

The presence of the recumbent stone has given Dr Burl an insight into the minds of the circle builders.

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00:21:50,000 --> 00:21:58,000

These are places of dread. People who built these circles were people who had very insecure lives.

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00:21:58,000 --> 00:22:03,000

They had no knowledge of what caused a blizzard or a drought or an epidemic.

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00:22:03,000 --> 00:22:12,000

They saw their children dying. They saw their crops failing. Not every time, but when it did happen, they had no means of stopping it because they had no understanding of it.

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00:22:12,000 --> 00:22:16,000

Now, if you're in that sort of situation, you either take an attitude of,

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00:22:16,000 --> 00:22:21,000

K-sur-ah, sur-ah, what will be, will be, or else you try to do something about it.

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00:22:21,000 --> 00:22:30,000

In other words, you're either fatalistic or else you try to be adventitious and try to intercede with

whatever is causing these disasters.

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00:22:33,000 --> 00:22:40,000

The recumbent stone told Dr Burl what the people who built this circle turned to for help in their uncertain world.

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00:22:41,000 --> 00:22:46,000

He found the stone had been placed between the southeastern and southwestern points.

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00:22:49,000 --> 00:22:55,000

They were concerned with one and one phenomenon only. That was the moon up in the sky.

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00:22:55,000 --> 00:23:02,000

Because the moon rises towards the southeast. It sets towards the southwest.

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00:23:03,000 --> 00:23:10,000

And there are nearly 50 recumbent stone circles where it's possible to work out exactly in which direction a recumbent stone is directed.

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00:23:10,000 --> 00:23:21,000

And every one of them is directed just to that position where the moon would pass between one

flanker and the other flanker passing over the recumbent stone and then setting.

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00:23:22,000 --> 00:23:30,000

The moon must have been an object, I think, of very special reverence, if that's the right word, to these people.

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00:23:30,000 --> 00:23:41,000

We don't know how they regarded the moon, but we do know, even from today's astronomical observations, that to pass from one flanker to the next,

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00:23:41,000 --> 00:23:46,000

the moon must have been slowly moving across the recumbent for one, perhaps two hours.

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00:23:46,000 --> 00:23:50,000

And it must have been at that time that the people performed their ceremonies.

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00:23:50,000 --> 00:23:55,000

But there's rather more than that. The moon has a very peculiar motion in the sky.

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00:23:55,000 --> 00:24:02,000

And once about every 19 years, the moon is very, very low on the southern horizon. Very low indeed.

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00:24:02,000 --> 00:24:09,000

And at that time, instead of being high up, it would have appeared almost to roll along the top of the recumbent stone.

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00:24:09,000 --> 00:24:11,000

A magical moment for the people.

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00:24:11,000 --> 00:24:22,000

Although there are some clues to ceremonies enacted on nights of the full moon, the ashes of fires, even the pitiful remains of many different children, the stones keep their eerie secrets.

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00:24:23,000 --> 00:24:36,000

When we look at circles like these, at least I am always very much aware of a mystery surrounding them, because we can collect so many facts about them, we can make so many deductions about them.

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00:24:36,000 --> 00:24:46,000

And yet in the end, when we stand in a ring like this on a beautiful moonlit night, I am more aware of mysteries than of answers.

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00:24:47,000 --> 00:24:54,000

I can see shadows, but what I can't see, however hard I try, are the people who built them.

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00:24:54,000 --> 00:25:01,000

I know something about their lives. I know their lives were short. I know their children suffered.

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00:25:01,000 --> 00:25:05,000

I can understand why they put up these stones.

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00:25:05,000 --> 00:25:11,000

But what actually went on inside the rings? The actual beliefs of the people.

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00:25:12,000 --> 00:25:17,000

These are matters which escape me, and I suspect they will always escape.

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00:25:17,000 --> 00:25:28,000

It's like reaching out into the darkness. You can go so far, but in the end, you can never touch them. You are always reaching for a shadow.

162

00:25:41,000 --> 00:25:45,000

Finally, the people who created this world.

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00:25:47,000 --> 00:25:51,000

Subtle questions, from life, by birth or death, in immense terraces.

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00:25:53,000 --> 00:25:57,000

And then but still in the end and at last, we have the kingdom of the stars.

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00:26:01,000 --> 00:26:02,980

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