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FOCUS

The magazine of discovery



INEXPLICABLE?
Something strange in the skies: the fireballs that science can't explain

Earth lights



Dateline
Midsummer night at Glastonbury Tor, Somerset

UNBELIEVABLE?
Why Christmas blow-outs are good for you – official



IRRESISTIBLE?
The wild, wet world of white water rafting



IMPOSSIBLE?
If you can't figure it out you'll just have to buy the magazine

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Puzzle page solutions

Number tease

11. Deduct the number formed by the first two digits from that formed by the last two to get the middle two (eg, 57-23=34)

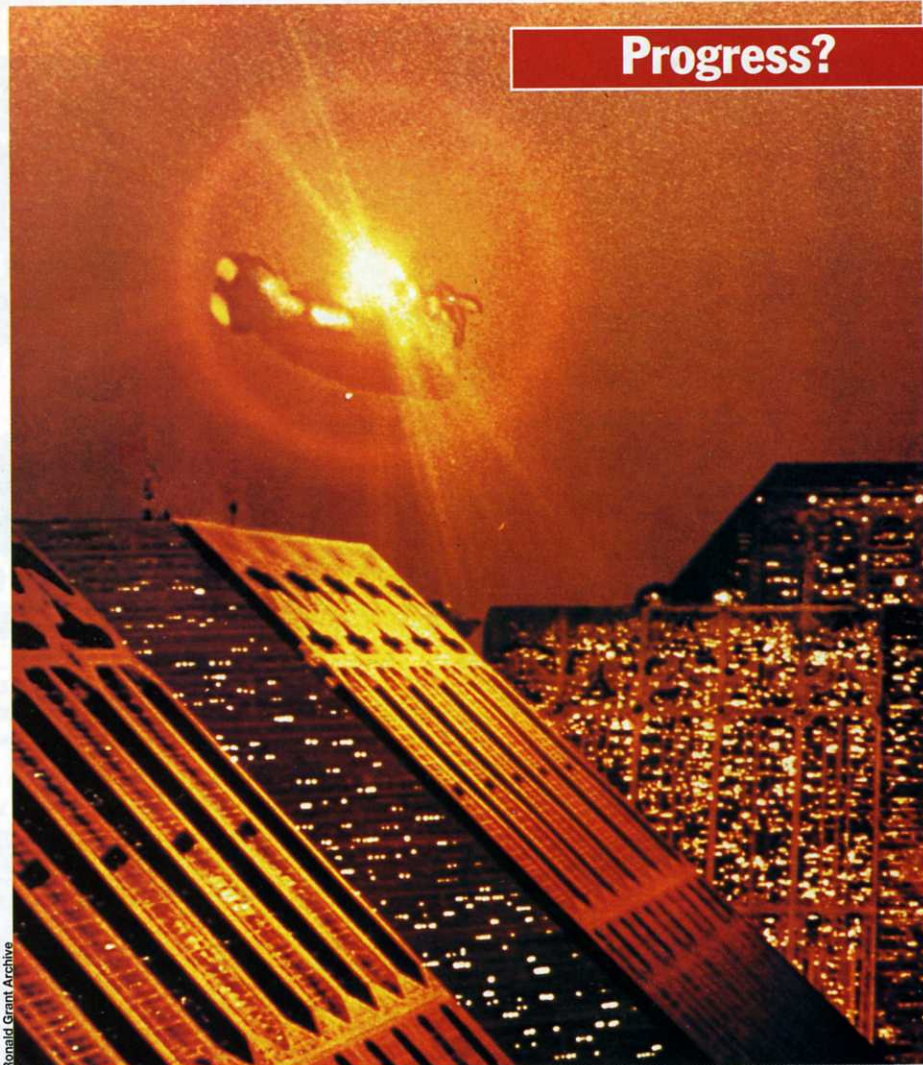
Mixed up

Peter 77, Robert 41

Puzzlegram



Don't miss next month's special N



Ronald Grant Archive



Vintage Magazine Picture Library

LOOKING INTO

There's nothing under the sun that Focus won't look into – but the future is our special territory. Come with us on a fantastic journey

Getting there

You don't need a time machine to reach the world of 2050: all you have to do is live longer. Medical researchers reckon humans should be good for 120 years – and that's without any technological fixes.

Still, 2050 is a long way off... and accidents do happen.

Read how the cryonics industry wants to freeze you till you can be fixed – or so they say.

Future city

Virtual village or megalopolis? With the world's population cramming itself into burgeoning new cities, we look at urban life 21st-century style. Are we heading for the lap of luxury – or a brutally policed desolation?

You and your family

The traditional two-parent family is reeling – rocked by rising divorce rates and changing expectations. At the same time genetic engineers talk of cloning and grandmothers give birth.

Will busy working women leave laboratories to do the child bearing? If so, who'll be related to whom? "I'd like you to meet my step-brother, who's also my uncle." How will you count your kith and kin in 50 years time?

The shape of games to come

The people of 2050 will be just as sports crazy. But what sport will they be crazy about? Any more for zero-gravity weight-lifting? Or will they be a race of virtu

'Fluffy balls of orange-coloured fire, moving through space, unhurried and majestic'



**The dragon lights
above Glastonbury Tor**

Baffled motorcyclists watch as earth lights flicker over Glastonbury Tor on Midsummer Day 1981. The Somerset hilltop, associated with Celtic Christianity and the legend of King Arthur, has long had a reputation for unexplained light

Strange tales of Earth lights



Once, they were fairies or dragons flitting through the air. Today, they're flying saucers. Is there an explanation for earth lights that really makes sense?

Glastonbury Tor, the purple light of an early mid-summer dawn. Two people are watching the tower from a distance. Abruptly, several fizzing balls of bright white light burst out of nowhere, streak across the sky, circle the Tor twice, and then disappear into the early morning gloom.

Norway, a freezing sub-Arctic twilight. A scientist watches a bright light move rapidly along a nearby mountainside. Inside a hut another scientist scans a radar screen that carries a blip where the light appears to be. He can't believe his eyes. The light source is travelling at 30,000 km/h.

Sightings of strange or anomalous lights have occurred in places all over the world, throughout history. In Ireland they have been seen as fairies, in Africa as devils and in parts of South America as the spirits of shamans flying through the night sky. In Denmark and Germany they were known as treasure lights, and people said that they hovered over buried gold. In England people invoked a different legend: the Anglo-Saxon Chronicle for



Dragons, gases or UFOs? It depends on your culture

Throughout history, and all over the world, there have been sightings of strange lights. Whether they are attributed to supernatural characters or to flying saucers is largely a matter of cultural belief

AD 793 noted that "fiery dragons were seen flying through the air".

People have always felt a compulsion to identify unidentified flying objects. Invariably they identify them according to their cultural beliefs. In our time, dragons are not an acceptable explanation. Our folklore is technological, our legends of flying saucers and alien spaceships chime with the 19th- and 20th-century myth that science and technology will create a perfect future. The "alien" explanation has fastened itself as firmly to strange lights as the dragon interpretation did in Anglo-Saxon times.

Unfortunately, as many interested researchers regrettably note,



Illustration by Arcana; Insets: Mary Evans Picture Library



In today's scientific world people would rather believe in flying saucers than in dragons

▶ the taint of flying saucer cultists has hindered scientific study. If you talk about the reality of lights in the sky in front of most scientists, they will stop taking you seriously fairly quickly.

But the lights do need an explanation. Does anyone have one? For centuries there have been people who didn't accept the folk consensus. In the 13th century Albertus Magnus wrote: "Some people say they have seen dragons flying in the air...This I think impossible, unless they mean vapours... These have been shown to burn in the air."

More recently, a number of researchers have begun trying to understand these puzzling lights. Perhaps the two most significant findings are the repeated occurrence of lights in particular areas, and the remarkable correlation between geological faults and unknown lights. It is this correlation that has led some researchers to talk about "earth lights".

Early in the 20th-century some scientists noticed that lights were often seen in the sky before, during and after earthquakes: following a 1930 earthquake on the Idu Peninsula, Japan, researchers collected 1,500 reports of unknown lights. Geological faults – fractures in the earth's surface – are often found where these lights are seen. A survey of a wave of sightings in 1954 found that 80 per cent of the sightings were at locations close to geological faults.

In 1979 two British researchers, geochemist Paul McCartney and writer Paul Devereux, decided to test the correlation. Their first test area was Warminster, a Wiltshire

town with a colourful recent history of flying lights – and a name that means serpent or dragon in Old English. The town and surrounding area, particularly a place called Cley Hill, had been the focus of a series of reports about an orange light-form "gambolling" around the landscape and beams of light emerging from the ground. But most of the Warminster region is tectonically stable chalk land, an unlikely area for geological faults.

However, it turned out that although there are only two faults in the region, one ran through Warminster and right beside Cley Hill. The other, shorter, fault also

What ball of gas shows up on radars and goes faster than military jets?

ran close to the hill. Numerous other studies show similar "hits", often just a few metres from sites where earth lights have occurred.

On the basis of such correlations, two Canadians, Gyslaine Lafrenière and Michael Persinger, have developed Tectonic Strain Theory (see box below) which suggests that huge electrical charges occur when the earth's crust pushes rocks together. A recent conference in Hessdalen, Norway (see box, right), brought together a number of scientists who are trying to refine explanations of anomalous lights. Some, like You-Suo Zou, a scientist working in the Department of Meteorology at the University of Utah, believe earth lights are

rapidly rotating fireballs consisting of hot ionised gas, or plasma.

There are problems with such theories. Plasma balls are an unstable, short-lived phenomenon, even in carefully controlled conditions. But earth lights often have a remarkably coherent form. Their shapes are geometric and symmetrical – commonly spheres.

John Blofield, who studies China, gives an account of the classic ball of light. In 1937 he visited Wu T'ai, a sacred mountain on the North China Plain where there was a tower built for observing "Bodhisattva Lights", which were said to appear regularly. Blofield witnessed the lights in the company of a monk. "We could not judge their size, for no one knew how far away they were...Fluffy balls of orange-coloured fire, moving through space, unhurried and majestic."

Ball lightning

Similar to "earth lights", fireballs in the sky are usually assumed to be a distinct phenomenon deriving from thundery atmospheric conditions. Many scientific papers have been written on them, but their coherence remains unexplained

Werner Burger / Fortean Picture Library

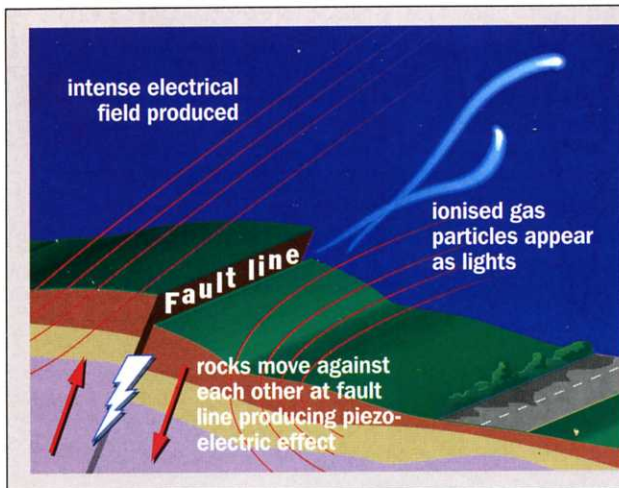


The balls are often orange, yellow or white, though they can take all kinds of colours – and sometimes they change colour. An American author, Phyllis Atwater, saw lights some 60 miles north of New York City in upstate New York. "The globes would bubble up from behind trees," she recalled. "They would first appear as pure white, until such time as they 'came loose' from the tree-tops, then they would turn blood-red. After attaining some height in the sky the globes would again change colour, this time to green."

Earth lights can be very stable. As a journalist from the *Birmingham Gazette* wrote in 1923, they can even travel against "quite a gale". Numerous marine reports describe glowing balls bursting out of the ocean. Sometimes they reach speeds that exceed those of the fastest military jets. They can measure several metres across and give a strong radar pulse. What ball of gas could do all that?

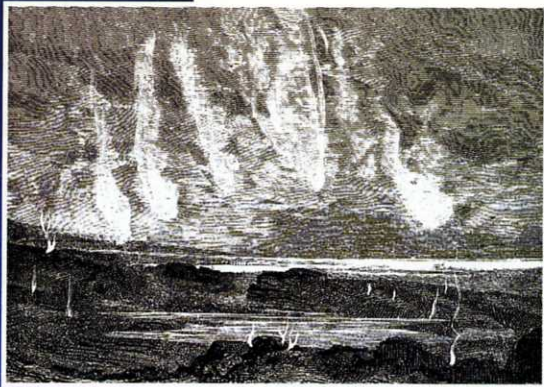
Any successful theory of earth lights has to explain not only balls but also other shapes, including bars, triangles, "tadpoles" and discs. It must also account for shape-changing. In 1905 an outbreak of lights occurred in Wales and a clergyman saw a mass of white light heading for a chapel.

"It suddenly took the shape of a solid triangle," he said. "Immediately over one corner of the chapel it hovered, and in spite of the distance we could see every slate." The next night, a reporter and a photographer from the *Daily Mirror* spent some hours



An electrifying explanation

When a crystal is squeezed, electrical charges occur across it (the piezo-electric effect); when enormous pressures in the earth's crust push rocks containing crystals together, vast voltages may accumulate – as high as 100,000 volts per square metre, according to some estimates. Tectonic Strain Theory suggests that such effects could create a surface "electrical column" that might ionise the air and produce glowing shapes. As tectonic stress would be especially intense along geological fractures, glowing shapes might particularly be expected in the air above and around faults.



Mary Evans Picture Library

The strange lights that nobody can explain

The streamers, aurora-like lightshows and flashes on hillsides that occur before, during or after earthquakes (above) have been ascribed to piezo-electric activity. Flame-like forms known as will-o'-the-wisps are often sighted on marshy ground (left). English folklore interprets them as wandering sprites. Scientists often assume them to be burning marsh gas, but the effect has not been satisfactorily replicated in controlled conditions. Curiously, the flames often produce no heat. There is no more a convincing explanation for ball lightning (main picture, left) than there is for other forms of earth lights. It is possible that they are all manifestations of the same phenomenon



Fortean Picture Library

watching the chapel. At 10pm a piercing point of light appeared. As the journalist ran towards it, the light "took the form of a bar of light, quite four feet wide, and of the most brilliant blue."

But that's not all. In 1980, Cynthia Newby Luce, a British woman living in Brazil, witnessed "a yellow-orange glowing ball" – a phenomenon familiar to locals who dubbed it "mother of gold". She recalls: "My gardener, fascinated, went after it. Foolishly, he reached out to touch it. The ball faded away to nothing as he put out his hand, then reappeared about 15 feet ahead of him."

Perhaps it was coincidence, but the ball of light appeared to respond to the man's movement. It also abruptly disappeared. Both these observations have been matched by other witnesses. The great rural poet John Clare wrote of lights in 19th-century Cambridgeshire. His first encounter left him at a loss: he felt "robbed...of the little philosophical reasoning I had about them". Several encounters later, Clare recorded this: "It came on steadily...and when it got near

me...I thought it made a sudden stop as if to listen to me." Its "crackling noise" and "luminous halo" terrified Clare so he "held fast by the stilepost till it darted away when I took to my heels."

Many witnesses of earth lights ascribe awareness or intelligence to the phenomenon. Two American geologists, Pat Kenney and Elwood Wright, saw an odd light several times in Marfa in Texas. They tried to "sneak up" on it by driving without headlights, but couldn't get close. "It looked as though it was playing with us," said Wright. "It was a heck of a lot smarter than we were."

Disembodied electrical intelligence? Plasma vortex? An unknown form of energy? However earth lights are eventually explained, these enigmatic atmospheric phenomena are not going to disappear. They are even embedded in our language: what, after all, is the origin of the phrase "fairy lights"? *Piers Alder* ■

Find out more ● Earth Lights Revelation by Paul Devereux (£5 including p&p from P Devereux, 39 Alma Place, Penzance TR18 2BX)

The curious case of the Hessdalen lights

In the early 1980s, strange lights suddenly began to appear in a sparsely inhabited valley called Hessdalen in central Norway, 120 kilometres south of Trondheim.

On 24 September 1982 at around ten in the evening, Bjarne Lillevold had just come home from work when he saw a "big light" on the mountainside – exactly at the spot where a friend's cottage was situated. Assuming that the cottage had caught fire, Lillevold anxiously headed out into the darkness to try to help.

When he came out of the pine forest close to the cottage he saw a light "as big as the cottage" hovering over the snow. The light was yellow and moved slowly up and down. A few minutes later it drifted down the valley and then it disappeared.

Both national TV and the newspapers became interested and a number of "ufo-logists" turned up, hoping to see aliens and flying saucers. Then, in 1984, a group of engineers from Ostfold College, near Oslo, also arrived. Intending to get some hard evidence, they set up a



The field station for the Hessdalen project in 1984

Photographs courtesy of Erling Strand © Project Hessdalen

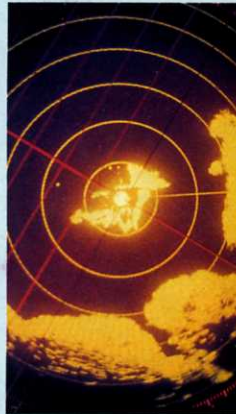
mobile field station with a range of instruments including radar, geiger counter, seismograph and cameras.

For just over a month the team staffed the field station in the middle of the icy winter. They reported 188 lights. Some were captured on radar while being seen by the naked eye; at other times there was a blip on the radar but no visible light. Some lights stayed in the same place for longer than an hour, others drifted slowly or moved off – at speeds of up to 30,000 km/h.

One or two members of the team became convinced that the lights were in some way sentient. One night a member of the team was monitoring a slow moving light when it started travelling across the valley directly

towards him. He decided to contact others in the team, and reached into his coat and pulled out his radio to do so. But the very instant he pulled it out, the light went out.

In the later 1980s, the lights appeared only rarely, but recently they have become more frequent. Ostfold College is currently testing a prototype automatic measurement station, which will detect, track and monitor the unidentified lights.



Visual proof

The lights gave a radar reflection (above) as strong as an aeroplane. Pictures of the lights (left) have been taken using a camera specially adapted for spectral analysis

