

SCIENCE AND TECHNOLOGY NEWS | THE WEEK'S BEST IDEAS

# NewScientist

December 20, 2003 - January 9, 2004

**INSIDE**  
**US JOBS**  
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## HOLIDAY SPECIAL

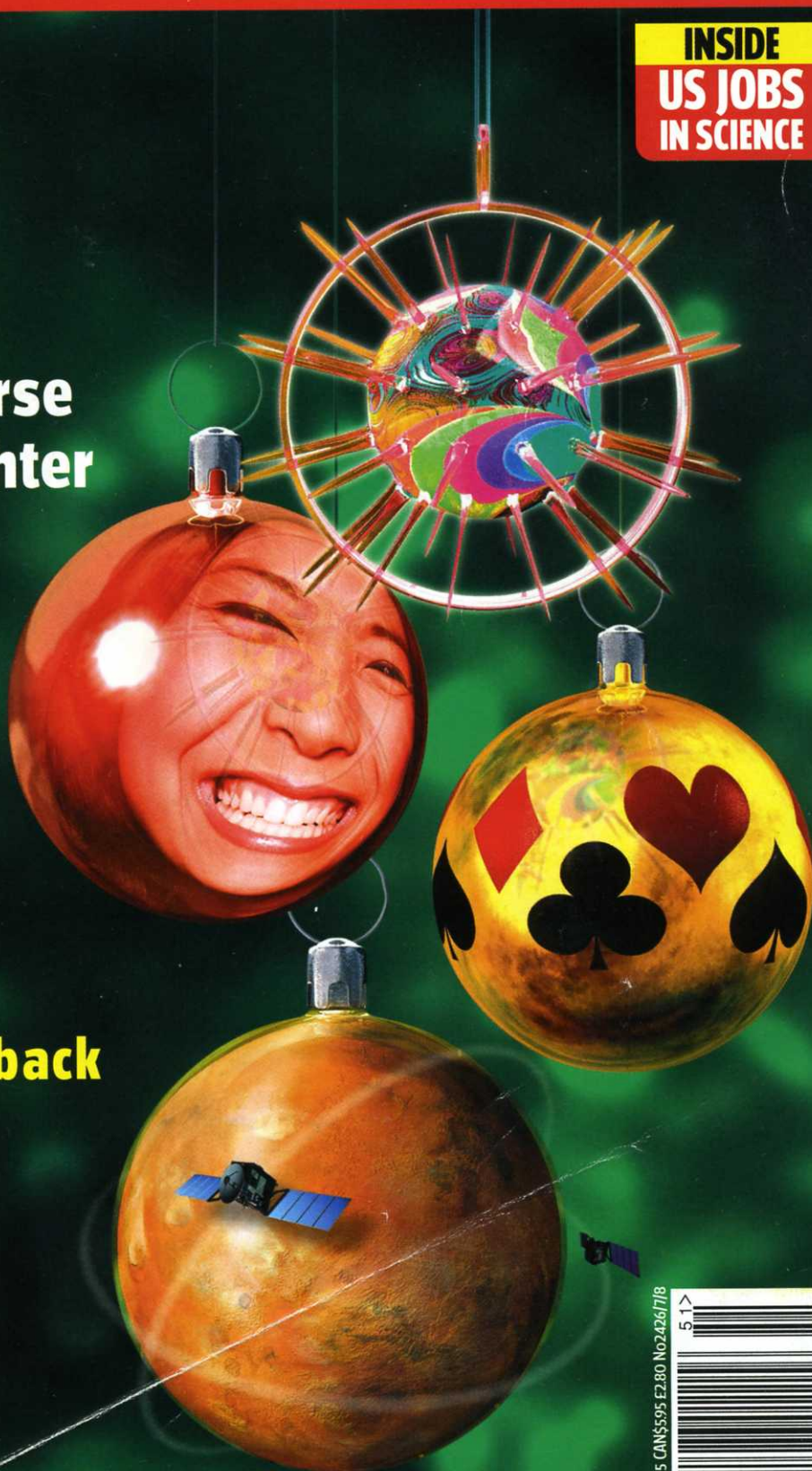
**Psychedelic universe**  
**The origin of laughter**  
**Poker-faced robot**  
**Meeting on Mars**

**PLUS**

**Non-shrink sheep**  
**Party dynamics**  
**The ancient matrix**  
**Freeze your grapes**  
**Phantom of the outback**

**NEWS EXTRA**

**REVIEW OF 2003**



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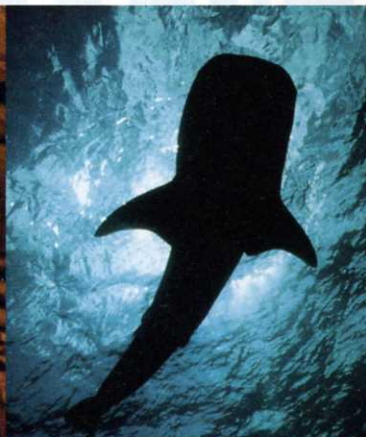
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Even if your holiday wishes don't all come true this year, at least you can rely on *New Scientist's* lucky dip of fabulous features – the perfect antidote to TV tedium. We bring you indoor avalanches, intoxicated animals and gravity-defying ice cubes. Find out how to throw the perfect party, go wild with a spot of extreme winemaking, or show off in your non-shrink woollens. And all you party-poopers out there take note: being a seasonal sourpuss can seriously damage your future happiness **36**

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If HMS Beagle hadn't sailed to the Galapagos, the Falkland Islands fox might have starred in Darwin's theory of evolution. Instead it went extinct **80**

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**"Is a sheep with human cells making up part of its brain no longer just a sheep?"**

Human-sheep chimeras may be created to supply transplant organs, page 4



# The shining

What on earth could be the source of the ghostly lights that chase travellers across the outback? **Douglas Fox** reopens the min-min files

**A BIT** past midnight, 16 September 1968, 200 kilometres east of Mount Isa in Western Queensland, Australia.

Traffic is sparse on this dusty, dune-wandering road – especially at this ungodly hour. But for five minutes now, Mike and Janette have suspiciously eyed the single dim light following 100 metres behind their truck.

Mike pulls over to let it pass. Instead, the light stops behind them. The pair begin to feel uneasy. Finally they climb out of the truck and stand in the darkness, watching the mysterious light.

Then it happens. With startling speed, the light hurtles into the air and rushes forward, glaring down on them from above. Janette screams, flees to the truck, slams the door, pounds the lock down and yells at Mike to follow. He leaps in, turns the ignition

**It's not just Australians who see weird lights – sightings have been reported in Norway and Texas, too**

and as the engine roars into life, the light shoots to the horizon and blinks out. As the truck gathers speed, Mike realises the hairs on his neck are standing on end.

That late-night fright was not a one-off. Known as the min-min, it is a fabled apparition of the Australian outback. Scrubby old diggers who have seen it are reluctant to tell outsiders, and even if they do, they are unlikely to confide that when it came upon them on some lonely road in the dead of night, they were terrified.

The min-min appears as an undulating orb, bathing those who see it in cold, whitish light. But what is so scary is how it behaves, bobbing and rushing in at you – sometimes as close as a metre. Even if you career down some



dirt track at 120 kilometres per hour, the min-min will follow.

This phantom has prowled the outback longer than anyone can remember.

The Aborigines gave it its strange moniker, and still frighten wayward children with it. Similar lights have been reported as far away as Hawaii, Texas and Norway. But while there have been many attempts to explain them, from atmospheric gases excited by spikes in the Earth's magnetic field to nocturnal birds dusted in phosphorescent bacteria, none of the theories is universally accepted.

Now the mystery may finally be lifting. In a recent paper, Jack Pettigrew, a neuroethologist at the University of Queensland in Brisbane, has presented results that might explain not only the min-min, but a host of other spooky lights too.

Pettigrew saw his first min-min over a decade ago while studying owls in remote western Queensland. As he and his companions drove across the outback one night, they noticed a bobbing disc of whitish light that seemed to be keeping up with their vehicle. After a discussion, they decided to take compass bearings on it as they drove and to use these fixes to determine its origin.

The result shocked them. Although the light looked as if it was 100 metres away, the researchers drove 5 kilometres before seeing even a 1 degree change in its bearing. In other words, the light that had apparently been mirroring their every move had hardly shifted.

Checking a map, their compass bearings intersected perfectly at a section of road in a small community called Windorah. Later, when Pettigrew talked to some of its residents, they told him that a convoy of trucks had travelled the road at the time he saw the min-min.

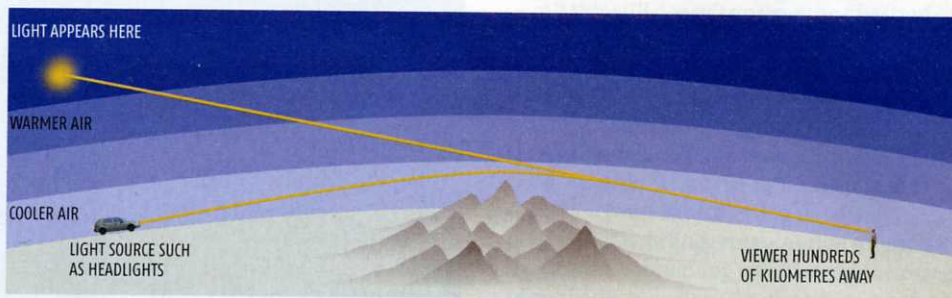
Their headlights would have pointed right at his team. The puzzling thing was that Windorah was 300 kilometres away, beyond a range of hills that rise to 100 metres in places. At that distance, the Earth's curvature should have placed the trucks far below the horizon.

A few months later Pettigrew got the chance to test a theory that had begun to form in his mind. One night when he and a team were camping in the same area of western Queensland, he climbed into a truck and drove 10 kilometres to the bottom of a sunken watercourse on the far side of a hill, out of sight of the camp. Then, calling his companions by radio, he pointed his truck toward the camp and flipped its headlights on. Instantly, his companions at the camp saw a min-min appear, and as Pettigrew flipped his lights, the min-min blinked on and off in perfect sync.

Pettigrew had timed his experiment carefully. The weather had been hot the day before, but the night was clear so the ground lost heat quickly – exactly the sort of conditions in which a rare form of mirage, the Fata Morgana, can form. Named after the

## NIGHT LIGHT

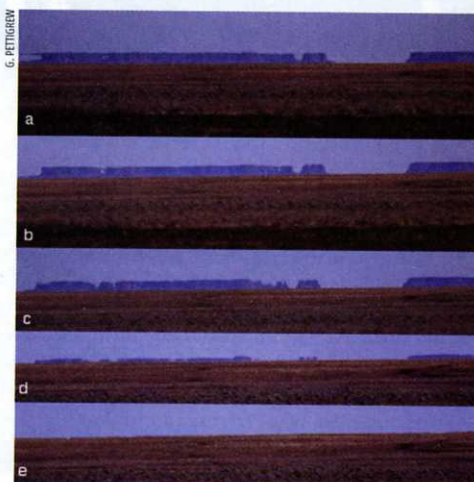
Min-mins appear when cold air is trapped near ground level under warm air. The cooler layer of air acts like an optical fibre, concentrating and guiding light for hundreds of kilometres



Arthurian sorceress Morgan le Fay, who conjured cities floating in the ocean, these mirages appear when cold air is trapped near the ground beneath a layer of warmer air. Because cold air has a higher refractive index than warm air, light is trapped in the lower layer by refraction and images of distant objects can be seen over long distances (see Diagram). Add natural features such as hills or valleys that fence in this cold air and you could end up with an air layer that behaves exactly like a giant optical fibre, channelling bright headlights over hundreds of kilometres, even over hills.

Over the next decade, Pettigrew continued to investigate the phenomenon in his spare time, and came to realise his explanation had to be right. Min-min lights are usually seen during the winter, for example, when cold-air inversions abound. This, and his artificial min-min, seemed to confirm the theory. But why had no one made the connection before?

Part of the reason, Pettigrew believes, is that the min-min appear at night. Daytime Fata Morganas are easy to distinguish as unreal, not least because they create an inverted image. But the min-min – a single point of light at night – is a different matter.



A Fata Morgana, revealing a range of hills that are usually far below the horizon. They fade as the air warms up (e)

Most people trust their vision implicitly, but at night our eyes are easy to fool. Take the way we estimate distance. Normally we use several cues, including our binocular vision and comparison with fixed reference points. Each is unreliable on its own, but together they work well. However, with a single spot of light in the darkness, we lose most of these cues. "You're left struggling and you put a lot of weight on brightness cues," says Pettigrew. "So if it gets brighter you assume it's getting closer." Maybe even that it is metres away. Imagine watching the moon from a car, for example, skimming the treetops and keeping up with you.

If you didn't know what it was, you might assume it was nearby and following you – even responding to your movements. "That's what makes people weep," says Pettigrew.

"The physics is strong, the meteorology is strong, it seems highly likely that that is what is happening," says Bill Physick, a meteorologist at CSIRO, Australia's national research institute, in Melbourne. But if Pettigrew has put the bugbears of the Australian outback to sleep, paranormal groupies and Scooby-Doos of the world need not despair just yet. There are still those other weird lights elsewhere in the world, and these haven't lost all their mystery yet.

Take the Hessdalen lights seen in Norway, for example. "Some might be Fata Morgana," admits Erling Strand, a researcher at Østfold University College in Halden, Norway, who studies them. But sometimes the Hessdalen lights are seen simultaneously from two directions by different people communicating via radio. "Fata Morgana cannot do that," says Strand. And for those who have seen it, even the min-min is unlikely to be spoiled by Pettigrew's talk of cold air. "There's something other-worldly about it," he admits. "Even when I muster all of my knowledge about optics and vision, it's still pretty amazing." ●

Douglas Fox is a science writer living in California

Further reading: "The Min-Min light and the Fata Morgana: An optical account of a mysterious Australian phenomenon" by John Pettigrew, *Clinical and Experimental Optometry*, vol 86, p 109 (2003)