Over the years, **The Last Word** has received some astonishing images of clouds. Here is a selection of the best

Clouding the issue

Joyce Lowe took this photograph while holidaying in Taormina, Sicily, about 30 kilometres north-east of Mount Etna, on 10 May 2006.

She sent it into **The Last Word**, wanting to know what had caused it; her grandson suggested it was a flying saucer, but **Last Word** readers weren't convinced.

Andrew Brown, a glider pilot from London, explained that these are lenticular clouds, caused by waves in the air downwind of mountain ranges.

These clouds do not drift, but form continuously as moist air from the upwind side of the mountain condenses. As the air descends on the downwind side, it warms and the cloud evaporates.

Solitary mountains rarely produce waves strong enough to form clouds, but in this case airstreams deflected around each side of Mount Etna may meet on the downwind side, contributing to the updraft.

Hadrian Jeffs from Norwich, UK informed us that lenticular clouds can provide useful signposts for aviators – albeit for quite contradictory reasons.

Pilots of large aircraft attempt to avoid lenticular clouds, because of the threat posed by the extremely powerful rotor forces that fashion their distinctive shape.

However, glider pilots will actively seek them out to use those same vertical air movements to obtain lift.

On the tube

Shuvra Mahmud saw this huge tube of cloud floating just below a uniform blanket above rural Oxfordshire, UK on 11 December 2007 and sent it to **The Last Word** to find out why it formed.

Again, Hadrian Jeffs came to the rescue.

Despite resembling a cigar, rather than being saucer-shaped, these clouds are formed by a variant of the same process that forms the lenticular clouds in the previous slide.

Cylindrical clouds are fashioned by rotor currents, when air, rising through a region of high humidity, abruptly descends instead, and the water condenses out to form droplets.

Usually this takes place along the lee side of mountain ranges or high ridges, such as those found in the Owen Standly range in New Guinea and along Germany's Rhine valley.

Circular clouds form when the currents mould the water droplets, like clay thrown onto a spinning potter's wheel – whereas a cloud cigar such as this is shaped like dough being rolled on a pastry board.

The best places to see cloud cigars are the Massif Central in France, and the Alps.

The former was a hotspot for sightings during the great French UFO flap of the mid-1950s, and the latter was the location for numerous reports of huge cylindrical "foo fighters" by British fighter pilots during the second world war.

Earn those stripes

While walking his dog on the beach on Waiheke Island, New Zealand, Brendan Zwaan spotted this cloud formation.

As he watched, more followed. The stripes gradually got longer and longer, then slowly disappeared.

Last Word reader Mike Follows explained that these are billow clouds, created by wind shear.

They are a manifestation of a kind of turbulence known as Kelvin-Helmholtz instability, which is created when different layers of air move at different speeds.

Typically the upper layer moves faster than the lower layer, creating eddy currents or an oscillation at the boundary between the layers. This creates a ripple effect.

Airline pilots normally take a detour around billow clouds, because they betray the presence of potentially dangerous turbulence.

Flight of fancy

Patrick Gregory came across these extraordinary clouds while flying from London to Grenoble on the morning of 23 December 2005.

The pictures suggest chimneys belching steam into the air at cloud level, yet the cloud base was seemingly far too high for this to be the explanation. The two images are from different angles.

Christopher White explained that the the clouds in these images are indeed produced by chimneys belching water vapour, although these chimneys are not at cloud level.

On this occasion, high air pressure has created a temperature inversion.

This means that, unusually, air temperature is higher at high altitude. Descending air warms up and traps any colder air at ground level.

There will be very little wind in the cold air mass, so the steam belching from chimneys will rise straight through the cold winter air. Because the steam from the chimney is warmer than the upper air mass, it can break through the temperature inversion into the warm air above it.

Incidentally, it's no coincidence that the temperature inversion is at the same level as the cloud.

Where the warm and cold air masses meet, the cold air causes water vapour to condense, forming the blanket of stratus cloud through which the steam emerges.

White even checked archives for the day in question at www.net-weather.co.uk, revealing that the necessary high pressure was present.

Genius of the lamps

Omara Williams sent in this photograph of clouds that look like they have come out of Aladdin's lamp.

It was taken by her husband outside their house in Cambridge, UK.

A number of **Last Word** readers responded, including three who sent in photoraphs of the same five clouds, taken on the same day but from different locations in eastern England.

See the next slide

Genius of the lamps – more

Reader Storm Dunlop explained how these shapes were formed.

They are altocumulus clouds, from which precipitation is falling.

Such trails of water droplets, or ice particles, are called "virga". By definition, they do not reach the ground.

Virgae are produced from "heads". These can be distinct, rounded clumps of cloud like the ones that are shown here, or ragged tufts.

They can also be extremely small patches of cloud that are difficult to distinguish from the tops of the virgae themselves.

Virgae occur at all cloud levels. Indeed, cirrus clouds – the thin wispy clouds that are popularly called mares' tails – essentially consist solely of virgae.

Bottom right image: taken by Rowan Moore at Dunchurch, near Rugby, 100 kilometres west of Cambridge.

Bottom left: taken by Martin Williams at Holme, near Peterborough, 40km north-west of Cambridge.

Top right: taken by Clive Semmens in Ely, 25km north of Cambridge.

The final picture, top left, is of a larger group of similarly shaped clouds. They were photographed from Nottingham, UK by Sean May on a different date.

Beaming down

Not all the images of extraordinary clouds that have been sent in over the years have been explained.

Back in 2004, **Last Word** reader Chris Mowbray sent in this photograph of a sunset producing vertical shafts of light, wanting to know what caused them.

He also wondered whether they might be related to a thunderstorm that was brewing.

If any of you can help, please email us or leave a comment on the Last Word Blog.

Multicoloured clouds

Jonathan Catt from Auckland, New Zealand took this photograph of clouds that look a bit like jellyfish.

Explanations to **The Last Word** please!

Chiltern cloud

Richard Blaise Machin from Oxford took this photograph. He wanted to know how such a strange-shaped cloud might have been formed.

Can anyone help? Again, please email us if so.

Cloud waves

Robert Salaman took this photograph at Ribble Head in Yorkshire, UK on December 2005.

He told **The Last Word** that the "waves" in the dark cloud rolled and broke just like real waves at the sea, taking about 10 minutes to do so.

Before these waves formed, and afterwards, the cloud top was fairly flat.

Does anyone know what is going on? Please email **The Last Word** if so.

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3

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