Brainbox Drafts November 2011-11-10

Brainbox 1

We have all become so used to relying on our mobile or cell phones that some of us find it difficult to imagine life without them? Sometimes however, the geography of the land around gets in the way and our phones don’t work as well as we would like.

 Mobile networks with lots of masts evenly spread all over the UK would generally offer the best mobile phone coverage and send and receive strong signals. But if the weather isn’t perfect the signal strength drops. The Cell phone radio waves travel best when the atmosphere is moist, but not too humid . Low storm clouds like cumulo-nimbus with lightening can interfere and distort the signals between your phone and the masts. Heavy rain may do the same. Very dry days may very slightly reduce the range of your phone.

Much more common and noticeable problems are caused but hills, woodland and large buildings directly between you and the phone mast. It is often difficult to get a signal by the seaside on a beach if there is a cliff behind you, or in a wooded valley. These ‘dead spots’ could be removed if more masts are built but often these rural areas would not have enough users to justify the cost. In cities, more masts and ‘cellular repeaters’ are used to keep signals around and in buildings high though many large buildings still have poor or no signals inside.

To keep your connection as strong as possible you should

* Charge your battery to full power. With Low batteries, your signal is more easily stopped by obstructions
* Turn off other features that drain battery power. such as [Wi-Fi](http://www.ehow.co.uk/how_8684763_boost-wireless-signal-bad-weather.html) or Bluetooth.
* Move away from other electronic equipment like , microwaves, [radios](http://www.ehow.co.uk/how_8684763_boost-wireless-signal-bad-weather.html), other phones and computers.
* Make your call at the top of a hill rather than on the way up and go to a window or door in a big building..

Brainbox 2

The problems of Coal mining in Wales

The Autumn of 2011 provided some sad reminders that Wales and coal mining have been linked for

nearly 200 years , in both the positive way of providing employment but also the very negative way of being one of the most dangerous industries in the Country.

In the Tawe valley near Swansea flooding in the tiny Gleision colliery killed four miners in September and only six weeks later and only a few miles away in Glynneath a trench collapsed in the Aberpergwm drift mine trapping and injuring three men.

The Aberpergwm is a modern and efficient drift mine employing over 200 people while the Gleison colliery had less than 10. Both mines get at the coal by cutting downward sloping ‘roadways’ into the valley sides to get at the coal seams.





Images like this but with white roadway sloping down to towards coal and with no valley on the right hand side ,

Mining coal from underground has a number of serious hazards.

Explosive methane gas leaks from the coal,

The roof of the passages will fall in has to be supported and sometimes even the walls are dangerous when the pressure on the rock shatters the wall into the passage.

The dust and noise are also hazardous to the long-term health of the miners.

The Drift Mines in the South Wales coalfield have an additional problem. The coal seams have been partly mined away by , in some cases, very old workings that are not accurately mapped or in recorded. These old mines can fill up with water and if the modern drift mine gets within a few metres, pressure can explode the wall , filling the workings with water so quickly that escape is difficult. This is what is thought to have happened to the Gleision Colliery miners . Very strict regulations to test the walls with probes and to move to safety points when blasting new tunnels must be followed in areas where old workings are thought to exist.

Brainbox 3

A set of explanatory diagrams - animations could be of use here but it is not essential

Most people usually link tornadoes to an area of Mid-West USA where the weather conditions can create monster ‘twisters’ . The UK has its share of tornadoes too and though none are as large as the USA storms, the do cause serious damage to buildings and have killed people with flying and falling debris.

The most recent UK tornado warnings were for November 3rd 2011 as the correct combination of weather features was needed was predicted

This is what they were

1/ When a low pressure area (depression) crossed the UK , air was drawn in from the west behind it.

2/ This drawn-in air had begun its journey in the Arctic and was very cold. It stayed cold high up but on its journey over the warmer sea it got much warmer at lower levels. This resulted in an unusually large temperature change from low to high in the sky.

3/ This air is call unstable because any hot air bubbles that starts to rise will shoot up (convect) like an uncontrolled hot air balloon. (Tornadoes need , of course, this fast rising air.)

4/ The next thing they need is the upper air to be moving away faster than the ground level air. This is called wind shear and when it occurs , it is just like a vacuum cleaner sucking up a carpet . On November 2nd the depression was moving the upper air quicker than the lower air, pulling it upwards.

5/ Finally the gravitational rotation forces of the earth ( caused the Coriolis Force) was there to start the spinning bit, like water down a plug-hole but in this case upwards! The rising bubbles of air could change into ‘super cells of convection’ In these the pressure drops so much that cloud forms in the spinning tube, occasionally touching the ground to create a visible tornado !

In the end, although the deeply unstable air was in place, it only led to a lot of places seeing heavy showers through the day and strong gusty winds. Bad news for tornado chasers but good news for the rest of us and the emergency services!