Racing pigeon navigate with ultraviolet rays

Ove Fuglsang Jensen, Denmark

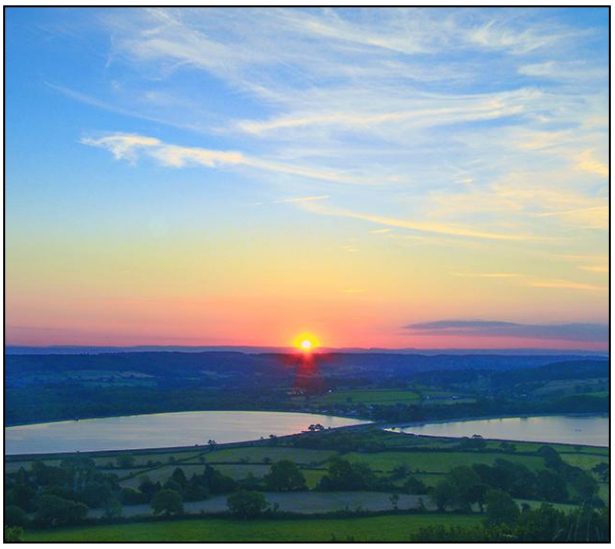
Strange race in good weather

Scattered returns - why?

Usually when our pigeons are released, the weather must be taken in concideration for a good release. Normally this will give a good race long or short. However if the race is not as good as expected maybe with scattered return of the pigeons. Here we have to use our common sense and the exclution principle to find out what can be the trouble for the racing pigeons in the race.

It is a scienticfic fact that racung pigeons (and a lot wild birds) take a bearing after two impotant elements: 1. The geomagnetic field of the earth 2. The ultraviolet rays from the sun.

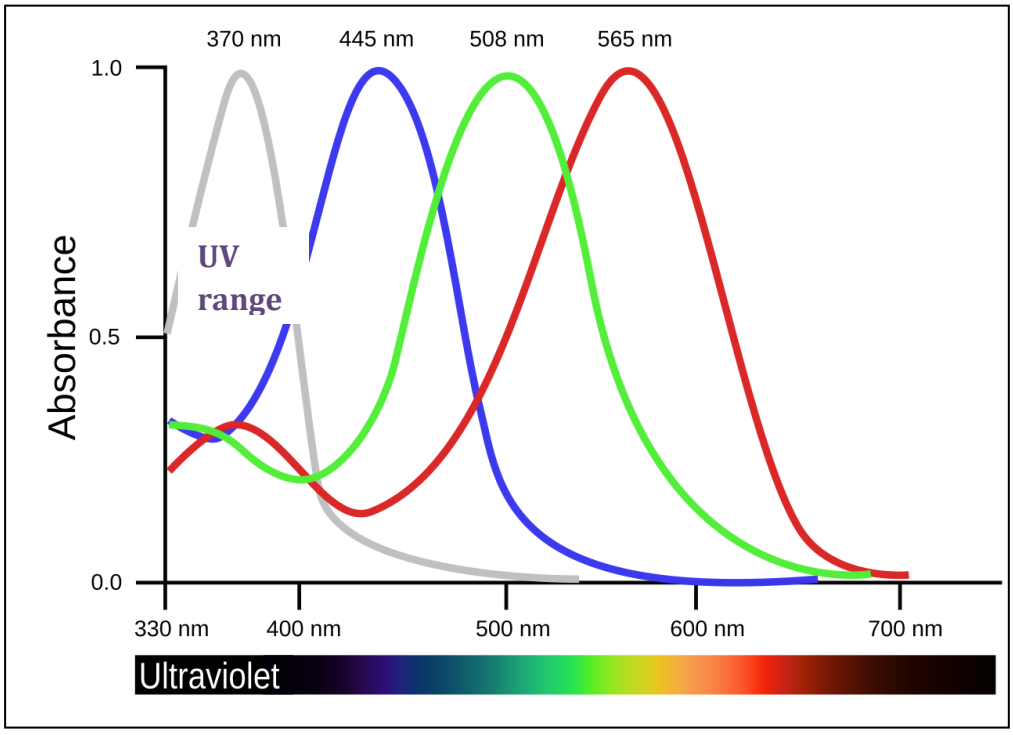
If we look thoroughly lnto the meteologic facts and find everything in order, we have to look at disturbasnce from the sun on the geomagnetic field of the earth. We also have to look at the time of the sunrise compared with the time of the release where the amount of ultraviolet rays can have an effect on the pigeons.
Are the return of the racing pigeons scattered, we have to look for trouble from the sun harrasing the magnetic field, and are there no trouble here we must turn into the amount of ultraviolet rayes from the rising sun!



Sunrise in the horizon. Even if the sun are partial visible, the amount of ultraviolet rays are not sufficient for releasing the pigeons. Are the sun in the horizon the sun rays goes through the earth atmosphere and hinder the ultraviolet rays in maximum. The ultraviolet rays make the sky blue!

Birds navigate in ultraviolet rays

Scientific investigation has shown that wild birds in navigating are using the ultraviolet rays from the sun and also using the ability to sense the magnetic field of the earth.
At the investigation with the wild birds on their sensitivity to ultraviolet rays, the scientist used a filer to close for the ultraviolet rays witch have a clear effect on the birds to lose the navigation. It is clear that birds use ultraviolet rays as critical tool for navigation, orientation and survival. Specialized eye structure allow the birds to perceive wavelengths between 330 and 400nm. The racing pigeon may use polarized UV light patterns near the horizon to calibrate internal magnetic compasses and time setting during sunrise and sunset.
Migrating birds can navigate on cloudy days using ultraviolet rays because UV rays penetrate cloud cover more effectively than visible light. Scientific research suggest that birds light dependent magnetic compass is primarily sensitive to short wavelength light including the ultraviolet ray spectrum.

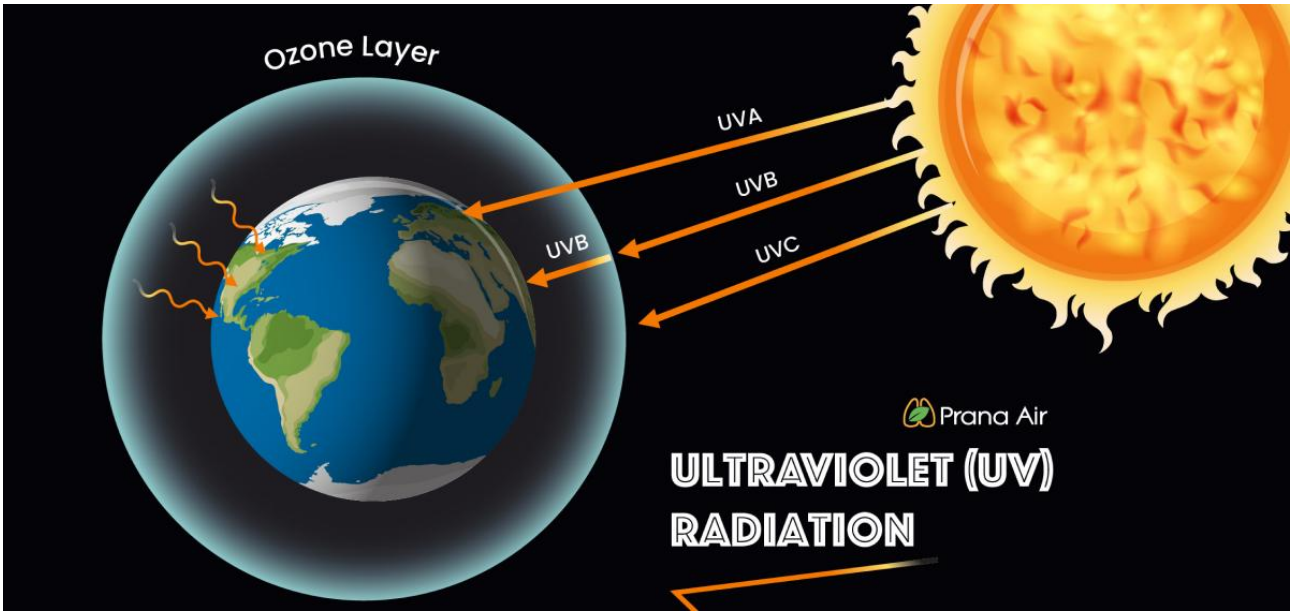


There are two sorts of light receptions in a bids eye, Rods and Cones. Rods contain the visual pigment which are for daylight and for less light in night. The cone cells are responsible for the shortest wavelengths extends to the ultraviolet range, making them UV sensitive. The UV range are 330-400nm.

Ultraviolet meter

Now it is established that ultraviolet rays have an effect on our pigeons, the question is then if it is possible to measure the amount of ultraviolet rays. On the market there are several types of UV meters in different prices, but the best UV measures are properly at 150 US Dollars. The types of UV rays from the sun are UVA-B and C as seen on the picture, and a UV meter who take the UVA and UVB should be good.

If it is not possible to buy a UV Meter, one must watch the sun rise sufficiently over the horizon to have the right amount of UV rays. Are the sun not visibly one can take a calendar and take the time of the sunrise here and wait for 30-40 minutes.



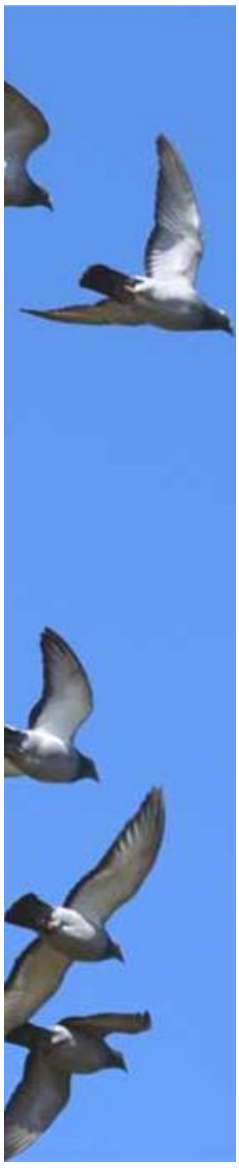
Types of UV meters

UV race in GPS

Early release at sunrise

Are there a race with scattered return and do 1 or 2 pigeons have GPS ring, and is it here possible to see how the pigeon react in the difficult race.

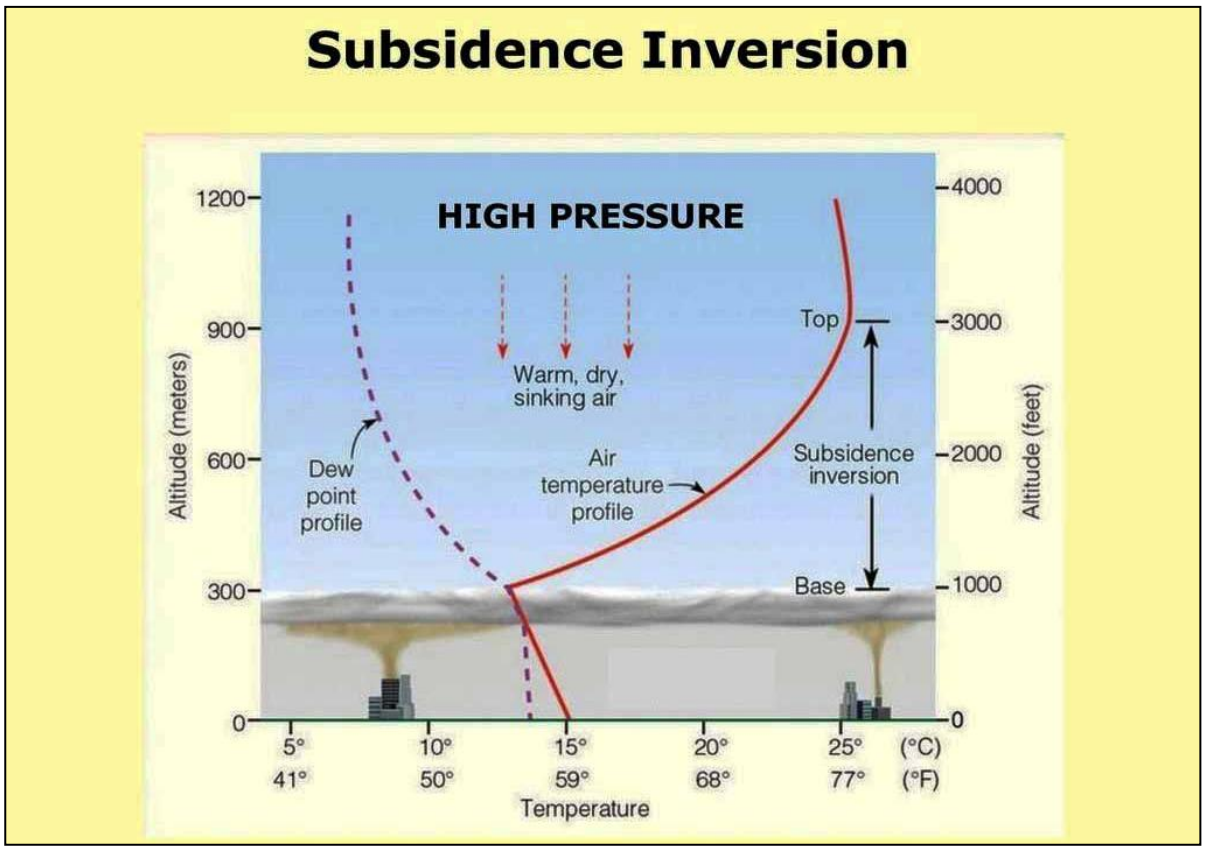
Haderslev release



Here are 2 races from the same destination with one week apart.
In 27. July it is clear that the pigeon takes a wrong bearing from the start, but takes a new bearing later on. The release are around 15 minutes after sunrise, and the sun will not give enough ultraviolet rays for a good bearing! All releases that day at 6.00 had scattered returns! On 3. August the release was 06.20 and gave a more normal race.

Ultraviolet rays in Subsidence Inversion

It has very clearly been proven, that a subsiding inversion will have a bad influence on the pigeons ability to navigate in a proper way, and that will of course make it difficult for the pigeons to take the right bearing home to the loft. In some cases this subsiding inversion can give loses of pigeons.
In recent years it is obvious that the Earth is having climate change, and one can just look at the News from all over the world showing the effect of climate chance. The climate change will also have an effect in racing our pigeons! One of the effects from climate change are the high pressures that can occur in the summertime.



This illustration shows clearly what is happening in a high pressure making a subsiding inversion. As shown the inversion are in position in 300 meters (1000 feet) over ground level.
When the pigeon are released, they feel an drift upwards and when the pigeons reach the inversion in 300 meters height things goes wrong for the navigation of the pigeons. The inversion layer is lifting the oxygen, moisture and ultraviolet rays into the inversion layer and the pigeons use the ultraviolet rays to navigate. In the inversion layer the pigeon will be "caught", and will be disoriented. In this way the pigeons can fly hundreds maybe 1000 km away!

A subsiding inversion are invisible, but the smog show the bottom of the inversion.

GPS in Subsidence Inversion

These 2 illustrations with 2 GPS routes, shows a remarkable coincidence of these routes even if the pigeons are released in 2 different destinations. The answer is simply that it is the same factor responsibly for the wrong bearing in the start of the race, and that is the very great high pressure over Scandinavian. This will make a subsidence inversion! The effect of the high pressure is not in the strongest because the release points are in the edge of the high pressure.

Chaos in subsidence inversion!

The release are in Carlstorf (481km) south of Hamburg. The pigeon tumbling chaotic around for several hours before the pigeon settle down.
It is a high pressure over Poland east of Germany and even if this high pressure are not very strong it can have an effect on the pigeons. Many fanciers had scattered return and missed pigeons on the day.

The scientist about ultraviolet rays in birds

1. It is clear that birds use ultraviolet rays as critical tool for navigation, orientation and survival.

2. Specialized eye structure allow the birds to perceive wavelength between 330 and 400nm = UV range.

3. Migrating birds and racing pigeons can navigate on cloudy days using ultraviolet rays because UV rays penetrate cloud cover more effectively than visible light.

4. The racing pigeon may use polarized UV light patterns near the horizon during sunrise and sunset to calibrate internal magnetic compasses and time setting.

5. Ultraviolet rays can be measured with a UV meter.