

Psycho Sunrise

At some point in our photographic journeys, all of us have been seduced by nature and its warm light: sunrise and sunset, glorious light, breath-taking colours. **Kaleel Zibe** ponders the reasons why we love the golden hour



I think I have turned into one of my children. Probably, my wife would say I have always been a big kid anyway, but let me put that aside for a moment and address the issue: I have started, to my own exasperation, asking repeatedly, "yes, but why"? If you have children, or nephews and nieces, you will recognise this inquisition and may have answered it thus: "just, because, ok"?

I know I have been guilty. The thing that has made me ask questions is our emotional reaction to sunrise and sunset. But I cannot say, "just, because" to myself; so I'll have to write the rest of the article instead.

Almost certainly as photographers you have crossed paths with the phrase "golden hour", or one of its variants, which refers to the glorious light we experience at sunrise and sunset; given a clear enough sky actually to see it, of course. I have been as seduced as anyone by the warm light of the sun's tendrils caressing the dawn landscape or the orange-red sunset setting fire to the sky around brooding, silhouetted hills. The light at these precious times of day makes us feel good.

The question is, why? »



» It is easy to say, "it makes us feel good", but why should this be so? And, can knowing why help make our photographs of these special moments more compelling or engaging?

Getting Emotional

When I look at a sunrise or sunset, either in the real world or in a photograph, I usually feel calmness and tranquillity as well as awe at the beauty of the natural world. At its rawest level, physics provides us with a stunning spectacle. I'll say more about that later, but our interpretation of the scene is based on much more than just the colour of the light, the shapes, form and textures and so on. Our minds colour the scene with our own emotional associations. I am interested in these emotional responses. Are they shared among us?

It is a surprising fact that, despite the number of colour-sensitive cones in human retinas varying by up to a

massive 40 times, we all map what we see to more-or-less the same colours; maybe, not exactly, but remarkably close. This implies that some kind of correction is going on in the brain and that a shared colour perception based on collective experience of the world around us has been arrived at in our common conscience.

So, if colour is seen the same, is it felt the same? What emotions are evoked in us at dawn and dusk? Do we all feel the same emotions? And is this learned or innate? To make further sense of this, I contacted Professor John Suler of Rider University in the USA, whose fascinating online book, 'Photographic Psychology: Image and Psyche' www.users.rider.edu/~suler/photopsy explores the psychology of photography. As well as being a professor of psychology, John is a highly accomplished photographer and has written extensively about where the two disciplines meet. He shed some light

on the emotions of the golden hour:

"Although cultural beliefs no doubt affect how we think and feel about sunrises and sunsets, I am sure that at least some of our perceptions of these events are inborn or innate, due to the fact that humans have been experiencing sunrises and sunsets forever. Our eyes have evolved to deal with how light changes between sunny and dark (i.e. cones and rods), so why not also our minds?"

He explains further that the feelings we have about sunrise and sunset are linked to the larger cycles of life:

"The cycles of day and night, beginning and end, opportunity and end, are analogous. Some would say that buried deep within our collective unconscious lie ancient memories of returning to the cave, to safety, warmth, and family, as the sun disappears below the horizon. The uncertainty and possible dangers of night approach. After the darkness, the sun rises once again, bringing »

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Sunrise at Victoria Falls, Zimbabwe
Nikon D3, 24-70mm lens @ 24mm
f/13, 1/50sec, ISO 200

Above

Bellowing stag at sunrise
Nikon D3X
Nikon 600mm f/4 & 1.4 TC
f/5.6, 1/800 sec, ISO 400

Right

Impala at sunset, Botswana
Nikon D3
Nikon 600mm f/4 & 1.7 TC
f/7.1, 1/200sec, ISO 3,200



» the promises and challenges of a new day to life".

So dawn and dusk are transitions between night and day and therefore remind us of the emotional associations we have with darkness and light.

Because we are diurnal animals, living our lives in the light of the day, our poor night vision shapes our perception of day versus night. Perhaps, because these transition times of day are fleeting, they evoke powerfully concentrated emotions, reminding us how much happier we are with the light of daytime. When this light is extinguished after sunset, the darkness crowds us with possible danger: the unknown threat of every shadow and unseen sound.

With this in mind, it is easy to see how sunrise can be associated with a new beginning: the birth of a new day, hope and a return to control, reason and normality. The tide of light floods back into the world, chasing away the fears of the previous night's darkness, and offering up opportunity for the new day. The positive associations we have with light are many. Throughout human history we have looked up to the sun as provider of light, heat, happiness and even deified it as a god. After all, without the sun, pretty much everything on earth would die.

Similarly, sunset is a metaphor for an ending: a time for winding down, returning to calm and homely warmth and safety before the creatures of the night emerge as the light ebbs away.

And the following morning, the sun rises again, repeating the cycle: the celestial

clock ticks. The solar heart beats.

To return to the question of whether we all feel the same emotions when we see a sunrise or sunset: there are many and various subconscious associations we apply when interpreting these glorious ephemeral moments between day and night. My opinion is, that between us, there are likely to be a mix of shared and individually unique emotions and I should be interested in your feedback.

And does this new understanding make our photographs more compelling and engaging? I like to think that anything in which we attempt to have a deeper knowledge, translates into better photography. The more we know, the better the connection between us and the image.

Below • Quartering short-eared owl at sunset

Nikon D3 & Nikon 600mm f/4
f/4, 1/2000sec, ISO 640

Below right • Angry clouds in France

Nikon D3 & Nikon 20mm
f/8, 1/13sec, ISO 200, -0.7 EV



Colour Psychology

Considering the associations we have with the transition times of sunrise and sunset, it is worth saying something about the psychology behind the colours themselves during the golden hour.

"Golden" is not really a good description because gold is only one form of this beautiful light. In general, the colours we are seeing are at the warmer end of the spectrum, associated with comfort and a warm feeling of happiness.

Orange is a colour with energy and excitement, warmth and enthusiasm.

Yellow is the colour of cheerfulness, the colour we associate usually with the sun itself (even though the sun actually emits white light).

Pink is a lighter tint of red and is tranquil, calming and romantic.

Red is lively, energetic, stimulating, urgent, angry even. It certainly commands attention.

Occasionally I have looked at a particularly red sunset and thought the Martians had finally made their minds up to take a swing at us; Mars: the red planet, bringer of war. And indeed, if there are dark, dramatic clouds involved, the scene can be pretty threatening as well as exhilarating.

On holiday in France last year my daughter and I rushed outside to experience a huge thunder storm that had boiled up one evening. The light was bright red-orange and the clouds roiled and crackled with lightning. Along with the colossal noise and electric charge in

the air, the intense colours contributed to a feeling that we were about to be smitten down at any moment.

But usually we are seeing oranges, orange reds and golden yellow in the sky, which results in a sense of optimistic, non-threatening wellbeing: happy colours.

Combining these colour emotions with those associated with the transition times of sunrise and sunset discussed earlier, it is not surprising they inspire our awe.

The Physics

Pure sunlight is white and is made up of all the colours of visible light (the colours of the rainbow) combined together. This full spectrum white light is what we see on a bright, sunny day at midday.

The reason we see non-white, warmer sunlight at dawn and dusk is that not all of the colours which start out at the sun are getting through to our eyes. At sun-up and sun-down, those warm reds, oranges, pinks and yellows in the sky are coming to us after some of the greens, blues and violets have become lost somewhere on the way.

Have you ever noticed the stars twinkling? I used to think I was witnessing some distant violent spinning star, spitting out multi coloured coruscations, or an alien spaceship signalling across the void. I was disappointed, although intrigued, to discover that the steady, pure white starlight was being modified by the atmosphere only in the last little bit of its journey to earth. The light is bent about randomly and repeatedly when travelling »



» through the varying densities of matter that makes up the atmosphere. This bending process is called refraction.

Because the atmosphere is turbulent and fluctuates in density all the time, the refraction process bends the light randomly in different ways so that the starlight does not come to our eyes in a constant, direct stream. The result is a varying of the intensity of light over time and the stars appear to twinkle, which is known as "stellar scintillation". If the atmosphere can make the light of a distant star appear to wobble, it is not surprising that it can have a much larger effect, albeit via a different process, on our own star, the sun, which is much closer.

When the midday sun is directly overhead, the pure white light punches down through the earth's atmosphere to reach us. In general, the colour of this light is not modified that much. In comparison, at sunrise and sunset, by definition, the sun's position in the sky is very low on the horizon. The sun is still sending us pure white light, but this light is travelling much further, sideways if you like, through the earth's atmosphere before it reaches us. The more atmosphere the light has to travel through, the more of a colour shift we observe.

Because the sun is much closer to us than the other stars, sunlight is less affected by the refraction process that makes stars twinkle. But it can be modified dramatically by a process called Rayleigh scattering, where light is absorbed by gas molecules in the atmosphere and radiated off in different directions.

Not only that, but the scattering is progressively more pronounced towards the blue/violet end of the spectrum. So, the more these cooler colours become scattered, the greater the visible warming effect we'll

perceive, because what is left are the warmer reds, oranges, pinks and yellows that are unaffected largely by the gas molecules and pass straight through.

The most vivid sunrises and sunsets happen when there are larger particles in the atmosphere, such as dust and water. Light gets bounced off the surface of these particles in the sky around the sun, including the warm colours, and this spreads the light out to a wider area of the sky. The cooler wavelengths are then Rayleigh scattered on the way to our eyes, leaving only the warm light.

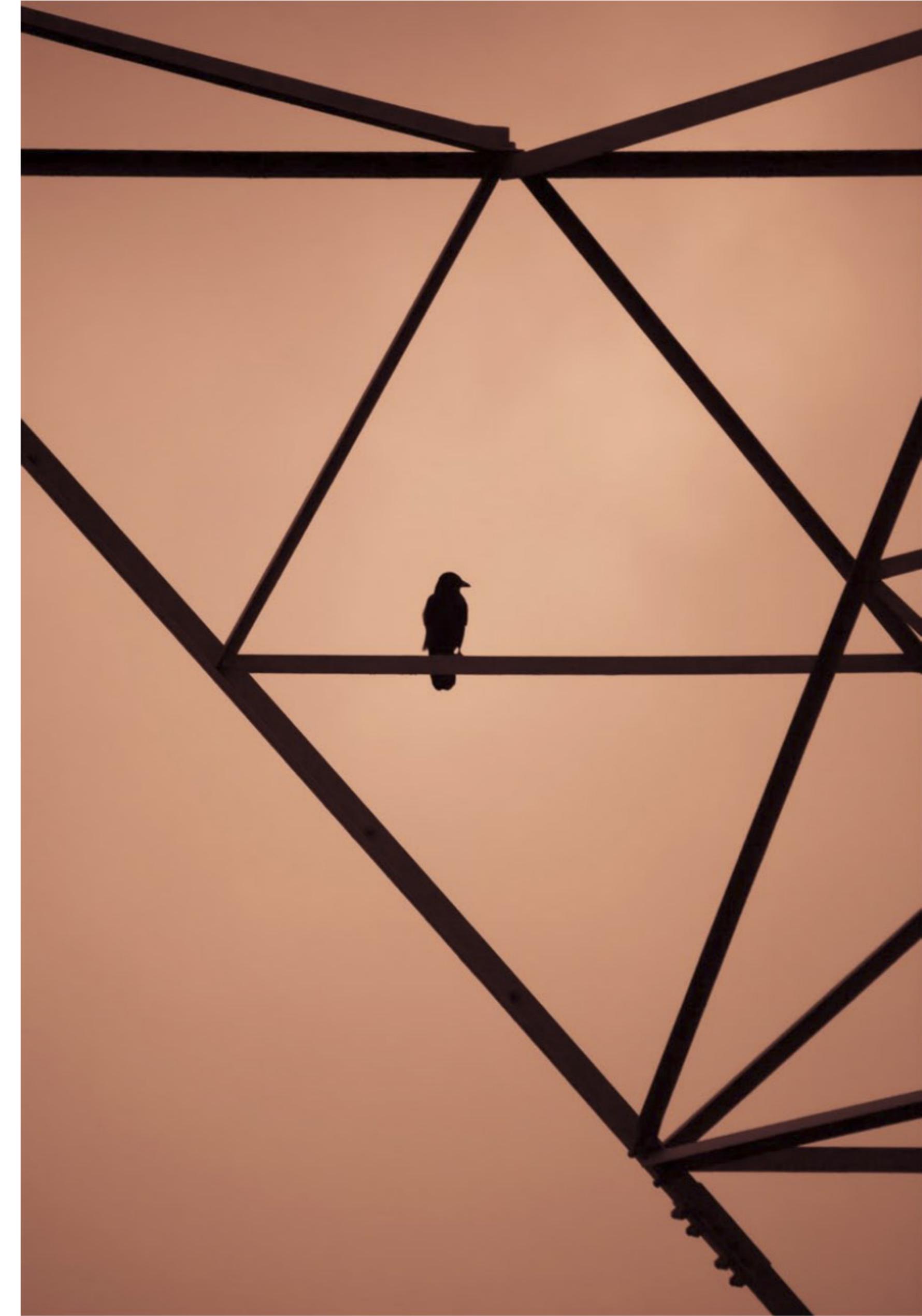
Dawn and dusk colours actually can be quite variable. The hues left over after scattering are dependent on the type, composition, size, colour and other properties of the matter doing the scattering. Volcanic dust, man-made pollution, water vapour, ice crystals, soot, salt and pollen are some of the almost endless list of atmospheric soup ingredients; not to mention the air itself, which is mainly nitrogen and oxygen molecules. »

Below • Elephant sunset, Botswana

Nikon D3
Nikon 24-70mm lens @ 70mm
f/10, 1/320sec, ISO 200

Right • Lone crow on a pylon at sunset

Canon 5D
Canon 100-400mm f/4.5-5.6L @ 400mm
f/5.6, 1/40sec, ISO 800



» By the way, the reason the sky is blue during the day is because of all the blue light that is scattered up in the atmosphere. We get the white daylight directly from the sun, but also see the blue light in the sky that has been scattered indirectly in all directions. It is scattered everywhere, but is more obvious overhead.

But just a minute, violet is the shortest visible wavelength and therefore is scattered even more than blue, so why is the sky not violet? Actually, the sky is violet as well as blue, but the three types of colour-sensing cones in our retinas overlap somewhat in the way they register colours. For some colour combinations a third colour is perceived when more than one cone type registers colours together. It just so happens that we perceive a blue and violet combination as blue and white without the violet, effectively just blue. So the next time a child asks, "why is the sky blue", you can blind them with science.

The animal kingdom has several different adaptations to seeing colour, probably to do with different evolution strategies. We are trichromats, meaning we have three types of colour sensing cones in the retina. Many primates share our trichromacy, whereas most other mammals are dichromats and see the world with only two types of cone receptors. For good measure, there are plenty of animals that have other arrangements of two, three or even four types of cones, with the latter also responsive to ultraviolet light.

Undoubtedly, animals with different colour perception are unlikely to see colours the same way as we do and probably do not see a blue sky, either.

Who knows what a tetrachromatic zebra finch sees when it looks up to the heavens?

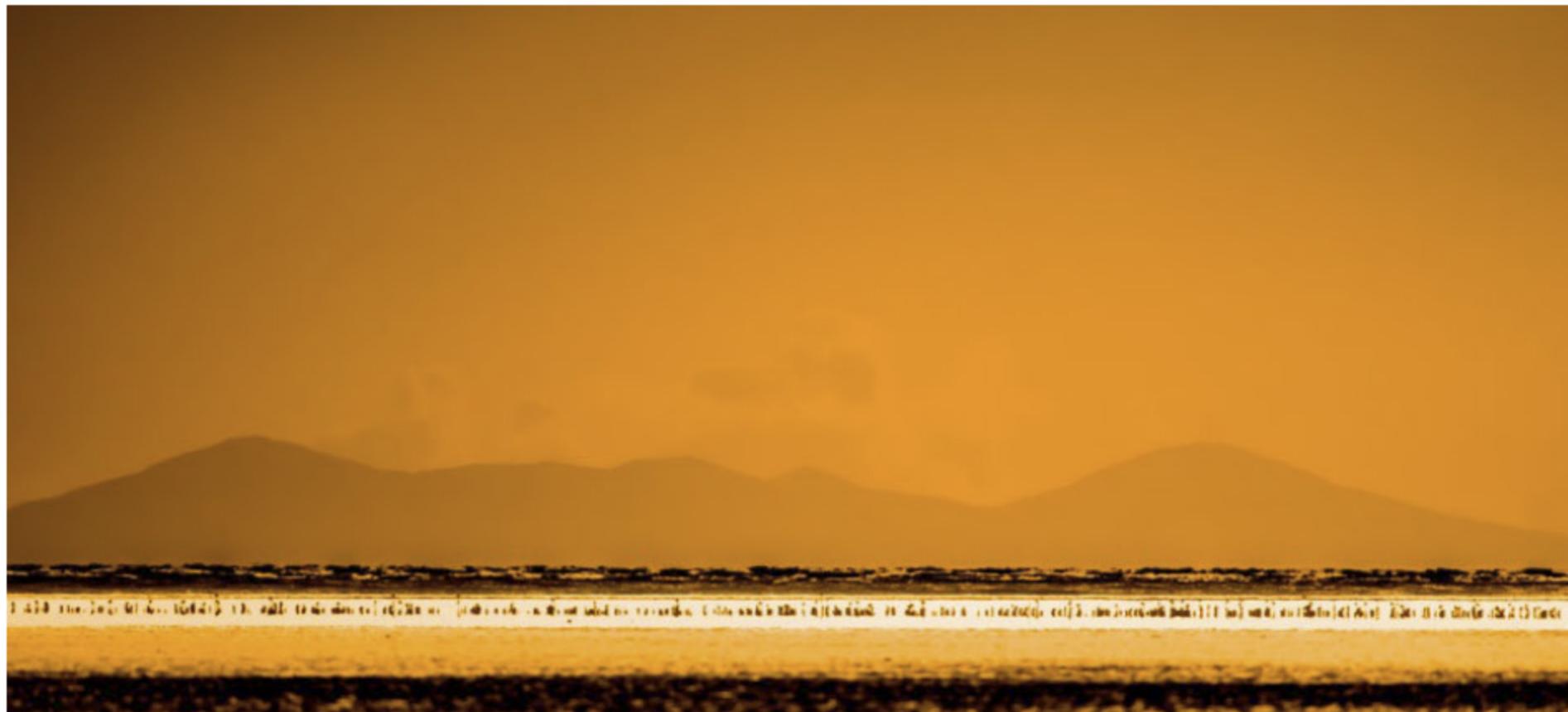
Golden Rules

And last, but not least, I'll say something about how to get the best out of photographing a landscape or wildlife scene, or preferably both, at this magical time of day.

It goes almost without saying that you will need sturdy tripod support for the camera. The ambient light level is usually a lot lower at dawn and dusk and therefore long shutter speeds are the norm. However, if you are shooting a silhouette, the sky is likely to be bright and, as long as you meter for the lightest part, avoiding the sun itself, you should be able to throw the landscape and any wildlife into silhouette while keeping relatively high shutter speeds, perhaps enough to avoid a tripod. Actually, there is a serious point to this: if I go out walking on the hills, I am happy to take a good camera and lens, but usually I am loath to carry a sturdy tripod unless I have gone out specifically to photograph rather than just enjoy the walk. If you can get a decent shutter speed, you do not need a tripod.

Also, not every landscape picture should be taken at extreme depths of field. I find often that an aperture of f/8 is absolutely fine, or even wider sometimes. It depends on the situation, but if it allows you to increase the shutter speed with an acceptable ISO, then it is an option. Indeed, for many wildlife pictures, it is pleasing to blur the background, so wider apertures of f/5.6 or f/4 can work well.

As for metering, multi-segment will work for a lot of images, but if you want to take control and if it has one, put the camera in spot meter mode. This allows you to get an exact meter reading off the sky, which is the important feature. If you need to focus on a point that is different to the metering point, you can put the camera in aperture



priority mode, spot meter, and make a note of the shutter speed and aperture required. Then switch to manual and dial in those settings, focusing on a different point in the image. Or you can do it the other way round: focus where you need to, put the lens or camera into manual focus mode and then take a meter reading from a separate point.

For ultimate quality, ISO should be kept relatively low to avoid noise spoiling the image, but digital cameras have come such a long way that this is much less of a problem than it used to be. However, digital noise accumulates all the time the shutter is open, so if you are going for very long exposures, it is best to avoid the higher end of your camera's ISO range. If you are shooting film, all you will have to worry about is film grain. Grain does not change over the exposure. Digital sensors have a distinct disadvantage for extremely long shutter speeds of several minutes or tens of minutes, as noise piles upon noise.

Another consideration for digital shooters is that the farther away from your camera's happy range of ISO, the more the dynamic range falls off. So pushing the ISO high will record less subtle tonal detail as well as more noise.

If you have ever fiddled around with a digital camera's noise settings, you may have come across one that allows the camera to remove noise during the shoot. It will be called something like 'Long Exposure Noise Reduction'. I recommend turning this off. What it is doing is taking a second exposure immediately after the main one so it can compare for noise and remove it in-camera. This is good in theory, but in reality, it doubles the exposure time. Post-processing noise-reduction software is so good these days that there really is no need for in-camera noise reduction anyway. »

Undoubtedly, animals with different colour perception are unlikely to see colours the same way as we do and probably do not see a blue sky, either



Above • Oystercatchers
Solway Firth mudflats
Nikon D300

Nikon 600mm f/4
f/4, 1/4000sec, ISO 400

Left • African sunset

Nikon D3

Nikon 200-400mm f/4 @ 350mm
f/14, 1/250sec, ISO 1600

» The Angel of The North picture was taken with a bulb exposure of several minutes, where I left on the Long Exposure Noise Reduction. Considering that I took a number of pictures with a similar shutter speed, and each picture doubled up for noise-removal, it was a long time to sit around at midnight in Gateshead with a number of distinctly unsavoury characters for company. I have not used the Long Exposure Noise Reduction feature since.

Always shoot in RAW unless you have very good reason not to. Unless you are a press or sports photographer who needs to transmit your pictures remotely from the field, jpeg files are too inflexible. You will be able to eke out much more tonal detail from RAW images and will have more latitude for adjustments.

For white balance, you may well

find it more pleasing to warm up the colour temperature by putting the camera on "cloudy" or even "shade" if auto white balance is cooling the colours down. This depends on how warm the colours are in the scene, but if you shoot in RAW you can adjust this later without quality loss in post processing.

So, what about wildlife? Wildlife has a rather awkward habit of being more active at these times of day anyway. If you are lucky enough to get an amazing sky behind your wildlife, it can make a stunning picture.

Actually, there is a big advantage in photographing wildlife at dawn and dusk in late autumn, winter and early spring: the angle of the sun is much shallower compared with that in summer. The sun never gets as high in the sky and therefore the light has to travel through more atmosphere.

This extends the golden "hour" to several hours in the depths of winter and means you do not have to get up so absurdly early. The lovely low angled light also emphasises the three dimensional form and texture of your subject compared with shooting with the sun higher in the sky.

Finally, whilst you probably do not think of sunrise and sunset landscape photography as action photography, it is surprising how quickly the sun moves through the sky. You may have minutes, or, in extreme cases, seconds to take the perfect picture.

To avoid last minute panics, it is a really good idea to investigate the location of the shoot beforehand at another time of day. Work out where you are going to be, check the time of sunrise or sunset, and make sure you are there in advance with the camera set up and ready.



Kaleel Zibe

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Angel of the North, England
Night capture, the orange tint is street lights reflected off clouds
Nikon D3
Nikon 14-24mm f/2.8 @ 14mm
f/22, 241sec, ISO 200