

Part 1- Understanding Tonal Range in Photography

Part 2 – Understanding your Histogram

Part 1

Understanding Tonal Range in Photography

Before we go any further...

Sometimes we hear the term Dynamic Range.

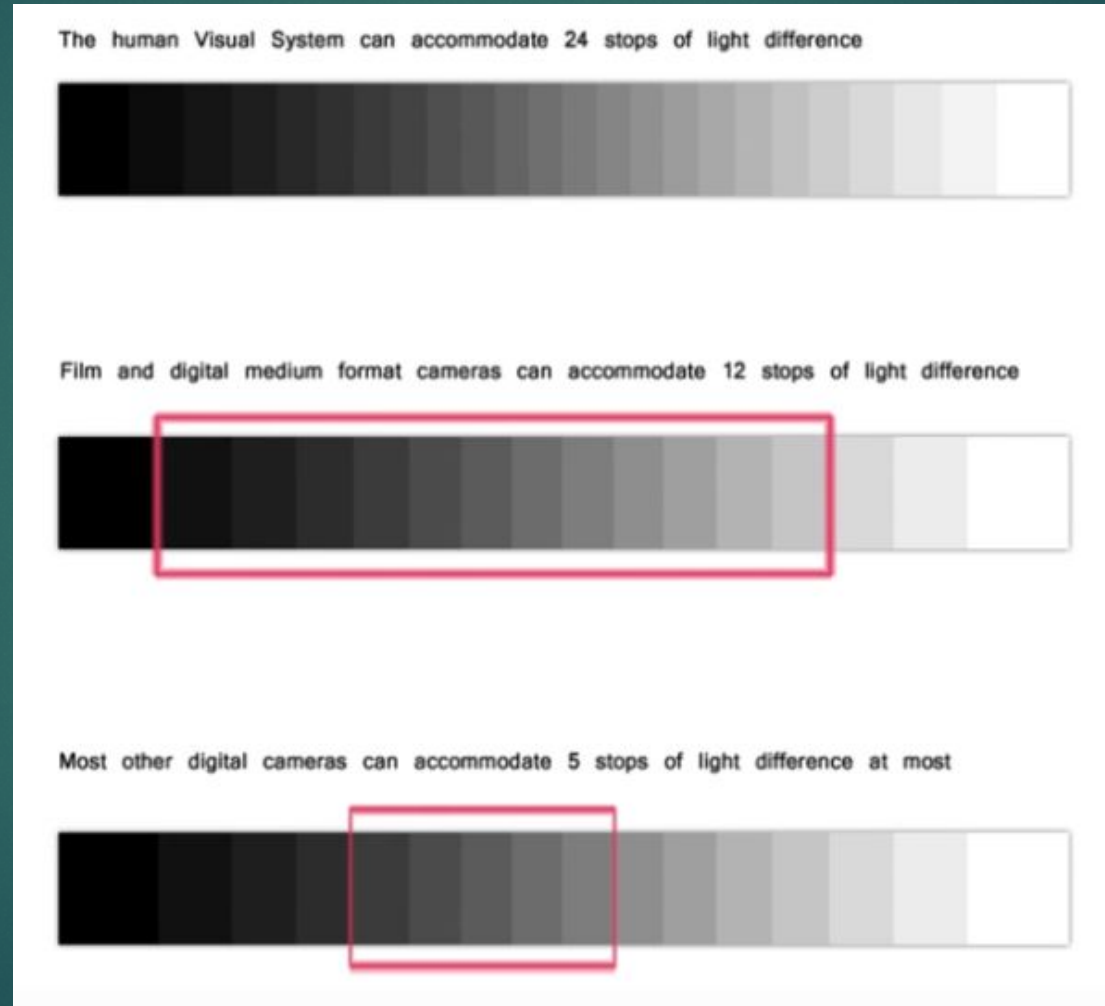
This is not to be confused with the Tonal range of an image although these are related.

Dynamic range refers to the difference in light between the brightest value and the darkest value that **the camera can capture**.

The human eye can see 24 different stops of light difference as a result of variation in light levels from highlights to shadows.

Cameras, however, only make instantaneous exposures, with film and expensive medium format digital cameras being able to capture 12 different stops of light variations, while most other digital cameras can only capture about 5 stops of light variations.

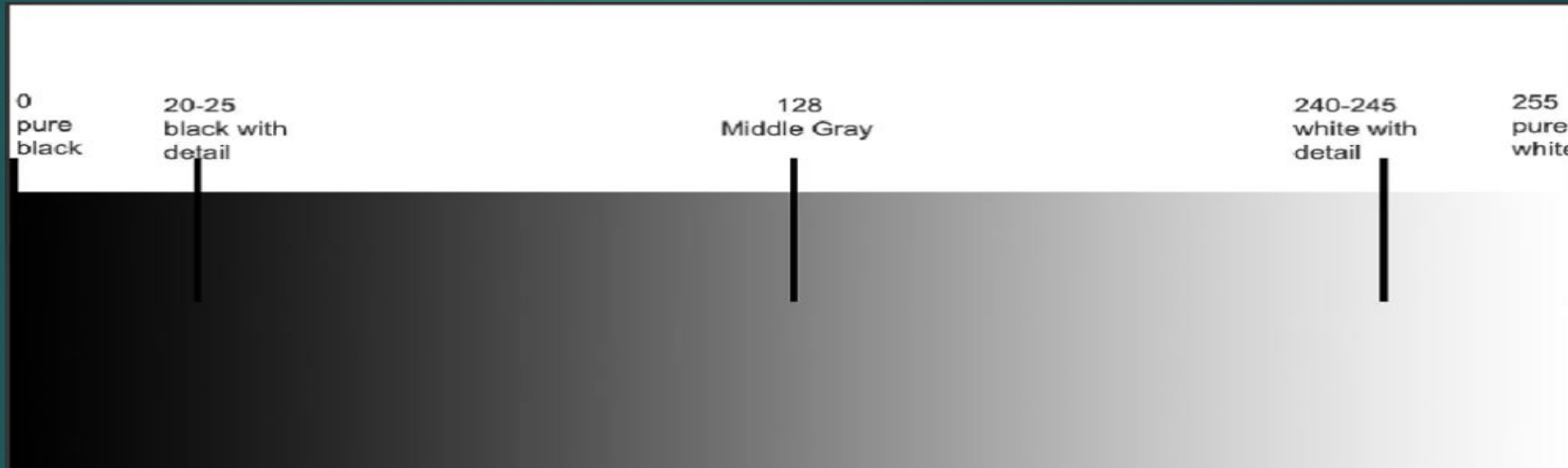
Human eye vs Film & Digital Sensor



Tonal Range

Tonal range refers to the measurement between the darkest to brightest area and everything in between within an image.

Values will range from 0(Pure Black), 128(Middle Gray) & 255(Pure White)



The range between the different brightness levels (also referred to as Luminance) within our photos determines its degree of contrast.

(An image with **contrast** will have values at both ends of the scale).

Naming the values



We move from complete darkness on the left (black) to complete light (whites) on the right. This scale applies for both colour and black and white photographs.

Tonal Range



Wide tonal range:
More mid-tone values
Great contrast



Narrower tonal range:
Less contrast



Even narrower tonal range:
Even less contrast

The wider the range expands, the more contrast there is, and the more mid-tone values would be represented in the image.

An image with a narrow tonal range would cover a more restricted area between its lightest and darkest values, thus mainly consisting of mid-tones and in turn, having less contrast.

Highlights

Traditionally, we think of highlights as the brightest portions of an image. In truth, highlights can be considered the areas of a photograph which consist of high luminance values yet still contain discernible detail.



Here's an example of highlight luminance values.

Highlights

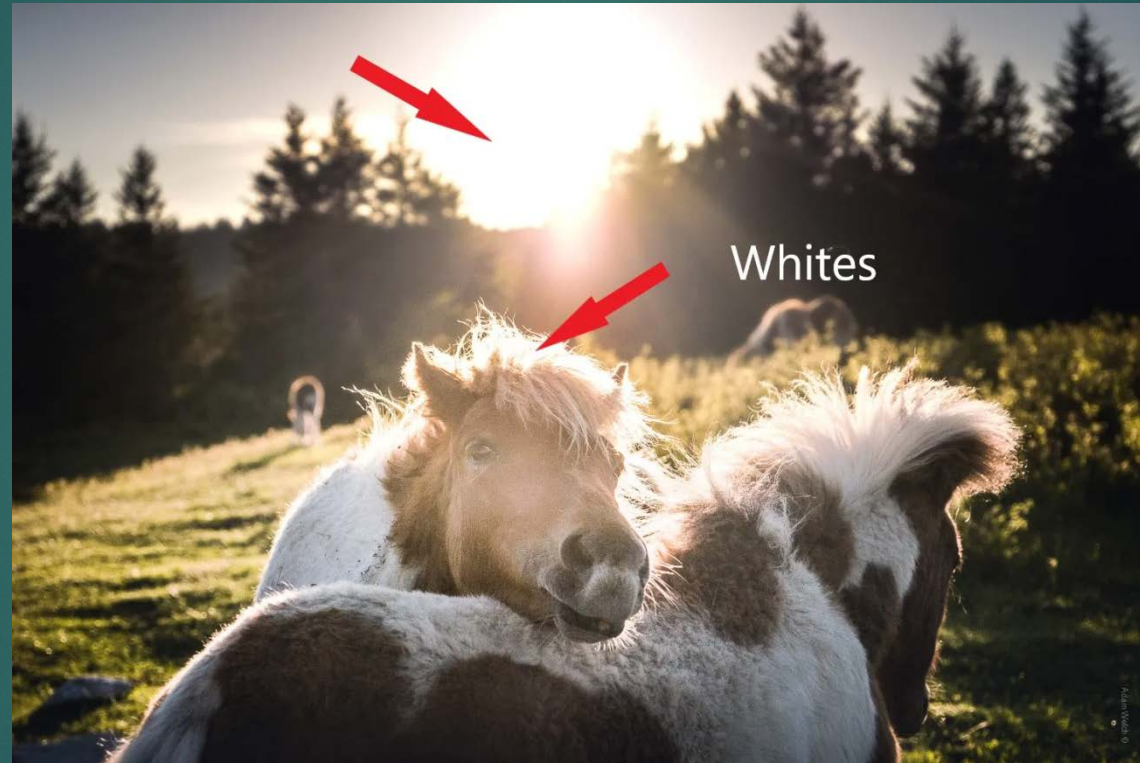
Notice that even though these areas are bright, there is still **some discernible texture and detail to be made out within the bright spots.**



If we were to increase the exposure, in camera or with post-processing, it would become so bright that it would lose detail entirely, which brings us to our next point.

Whites

If we increase the brightness to the extent that our highlights become 'blown out' (where details are invisible), we have complete white.



Depending on your photograph, it may or may not be desirable to push the exposure to the point of white-out. We'll talk more about this as we discuss the relevance of tonal range in regards to constructing your images.

Midtones

A mid-tone is precisely that – all luminance values that are not dark or light are considered to be mid-tones. Most of the time our camera meter will attempt to expose for this average brightness when in Automatic Mode.



While mid-tones help to ensure much information is contained in an image, a photograph consisting of only mid-tones lacks dynamics.

Shadows

Areas that appear as shadows are closely related to highlights albeit in the opposite direction. Shadows are the areas of a photo that are dark but still retain a level of detail.



These darker areas still possess information seen by the viewer.

Blacks

Any portion of a photograph that has zero luminance is considered to be black.



Completely black areas are so dark that you can see nothing. Consider them the 'dark abyss' within a photograph.

Having these areas within your image isn't necessarily a bad thing.

Luminance Values and You

Some photographers feel that images should contain no areas of complete black or complete white – that all portions of the photograph should present some level of detail for the viewer.

Still, others contend that it's perfectly fine to either black out or blow out some luminance values for the sake of contrast. Doing this means that there is an area of complete black and complete white so that all the other luminance values fall somewhere between those two absolutes.

While it's true that it is often desirable to deliver the maximum amount of visual information to your audience, this is not always the case. There are times when a crushed and burnt out shadow or a super-bright highlight are just what you need to bring a photograph home.

Like most concepts in photography, it's essential to have a full understanding of the tonal range falling within your photos. You should use this knowledge to strive for technical excellence and also so you know when to break the rules in favour of **fulfilling your creative vision.**

Summary of terms

Highlights – Bright areas within a photo that still maintain detail

Whites (Blown out) – Areas of extreme brightness where there is absolutely no information(detail) remaining

Midtones – These are neither shadows or highlights but rather a middle value of luminance (what your camera meter will aim to expose for when in Automatic mode)

Shadows – Darker areas of the image that still maintain detail

Blacks – Portions of a photo that contains absolutely no information(detail)

Part 2

Understanding Histograms

Histograms

► What is the histogram of an image?

The **histogram of a picture** gives the photographer an enhanced understanding of the brightness values in an image. Clipping, under/overexposure, and proper exposure can all be gauged with a glance.

How do you read a histogram in photography?

- **Reading a histogram** is done by gauging the amount of pixel information recorded at particular points along the curve. The more the curve is filled into the left of the graph, the closer you are to underexposure, and vice versa.

What is the perfect histogram?

The **ideal histogram** should look like a peak where all of the midtone values sit, with no clipping in either extreme of the graph. This, however, depends on more factors like the type of photography and the light conditions.

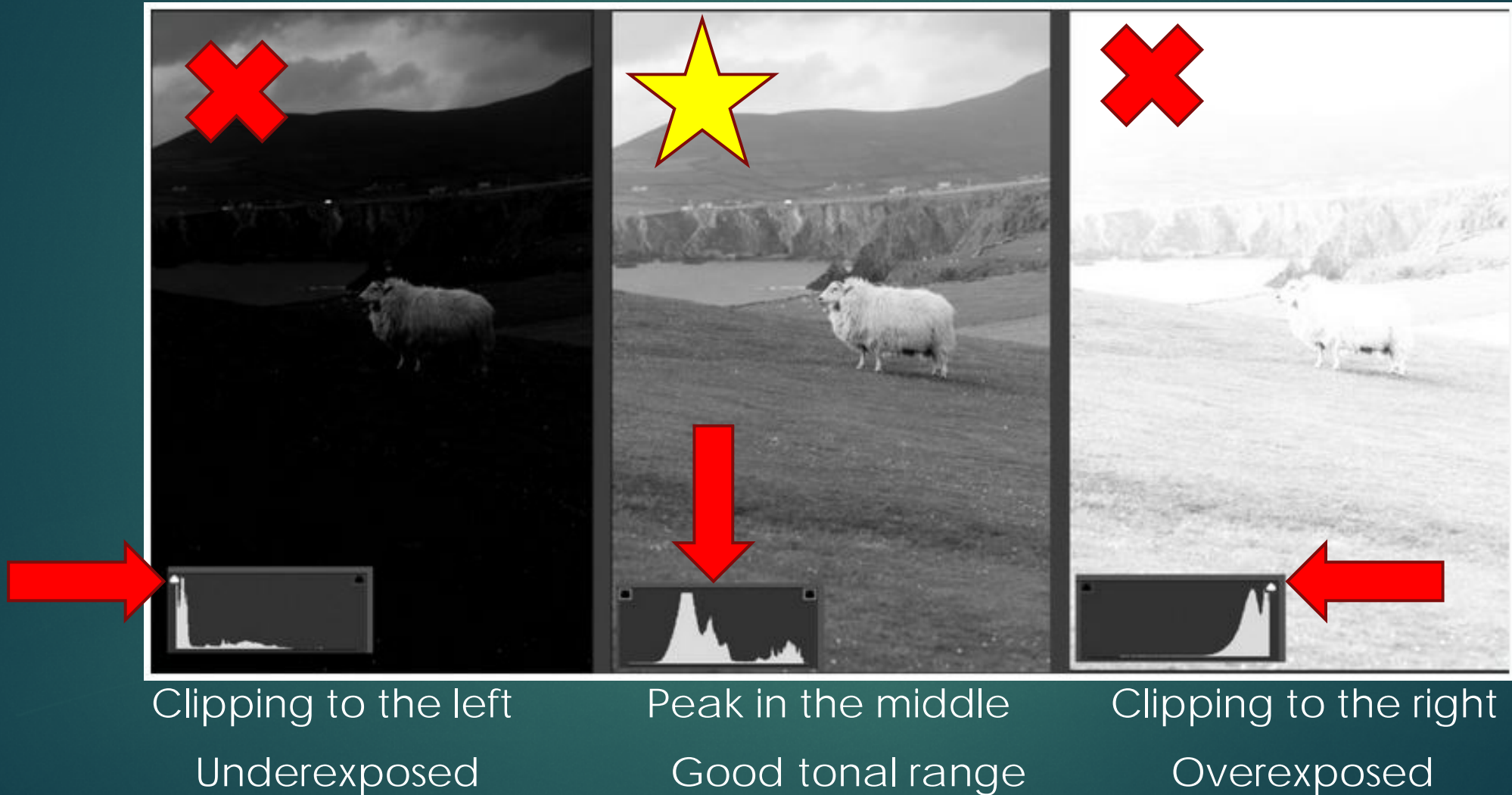
► Why would you use a histogram?

The **purpose of a histogram** is to gauge brightness in an image. In some applications, an over or underexposed image may suit your vision. However, histograms are perfect for giving a clue of how are the tones of your image in reality.

What does "clipping" the histogram mean?

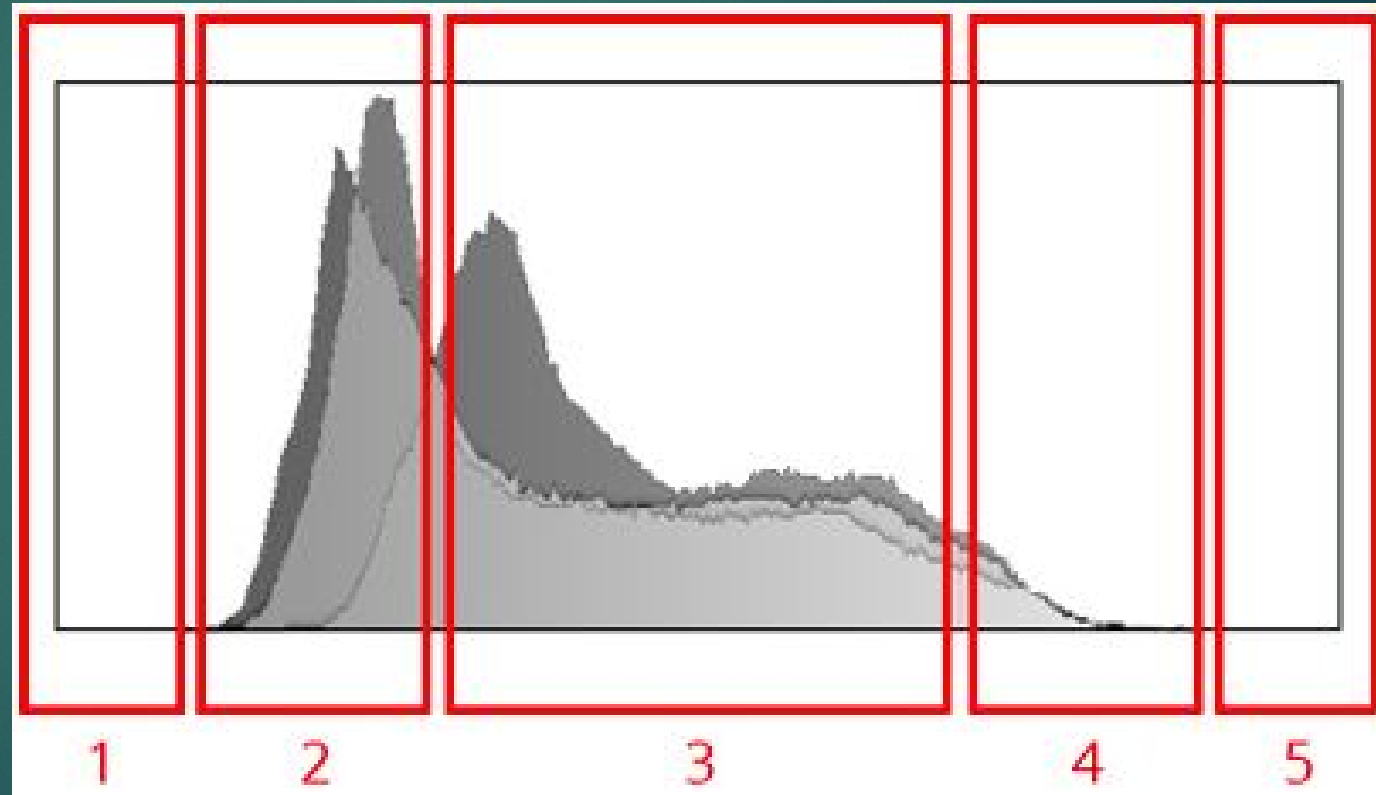
- **Clipping the histogram** refers to portions of the curve bunching against either extreme of the graph. Clipped tones have either 0% or 100% brightness values and are very inflexible in post.

Examples of Histograms



Reading your Histogram

- ▶ Zone 1 – Blacks
- ▶ Zone 2 – Shadows
- ▶ Zone 3 – Midtones
- ▶ Zone 4 – Highlights
- ▶ Zone 5 – Whites

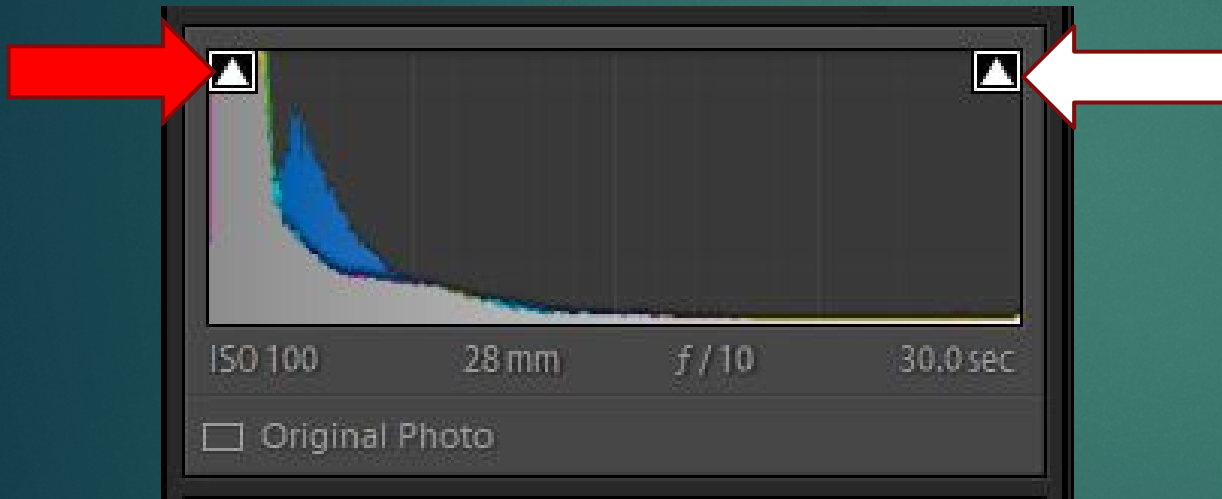


Why should we use the histogram?

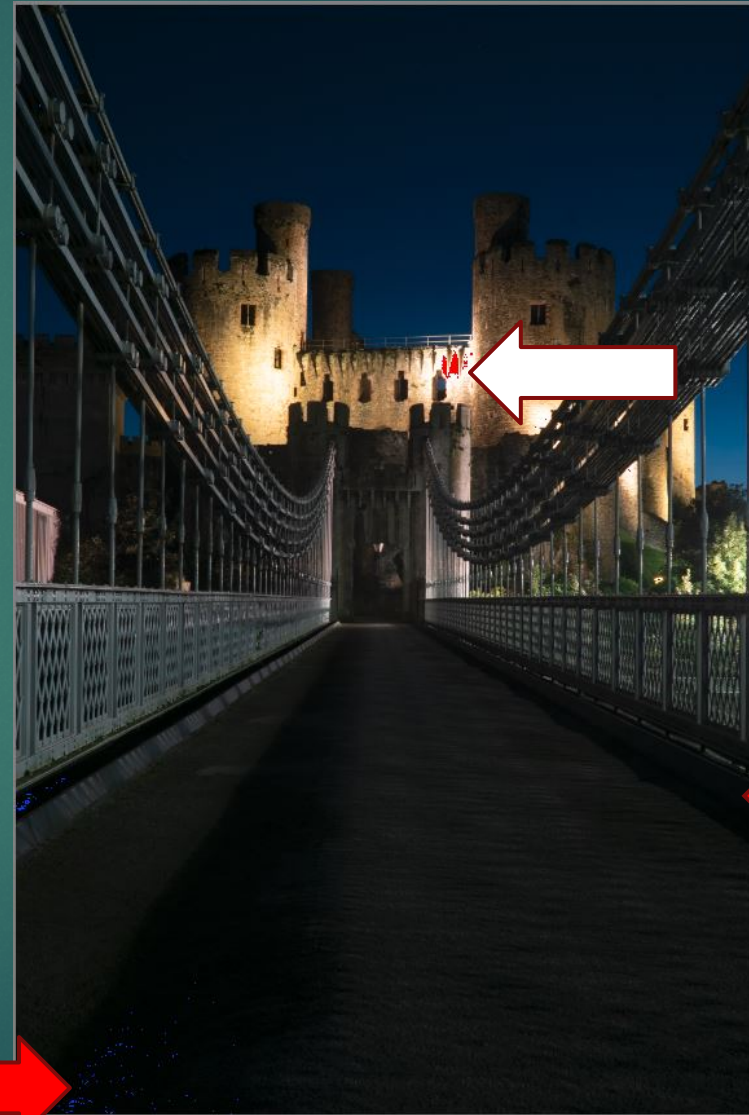
- ▶ The main reason for the use of histograms is because it is a much more precise representation of tonal distribution than a glance on the LCD screen.
- ▶ The screen preview might be misleading, especially in low light conditions as the display generates its own light and might make you think that your exposure is spot-on.
- ▶ Or vice versa – when the light is very bright (e.g. sunset) and you have to squint your eyes and still can't see much on the screen. That's the time for a histogram.
- ▶ Last but not least – use a histogram to avoid shadow clipping and highlight clipping.

Using Histograms in post-processing

At first glance this histogram indicates that the image is underexposed and we also have the highlights clipping...but all is not lost.



Let's start by increasing the exposure by 1.5 stops in order to deal with the underexposure first.

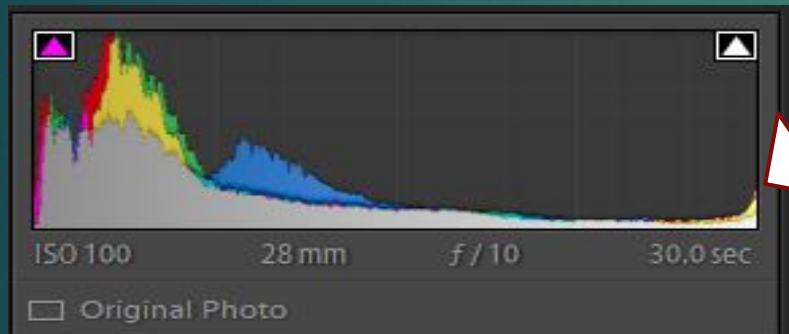


Using Histograms in post-processing

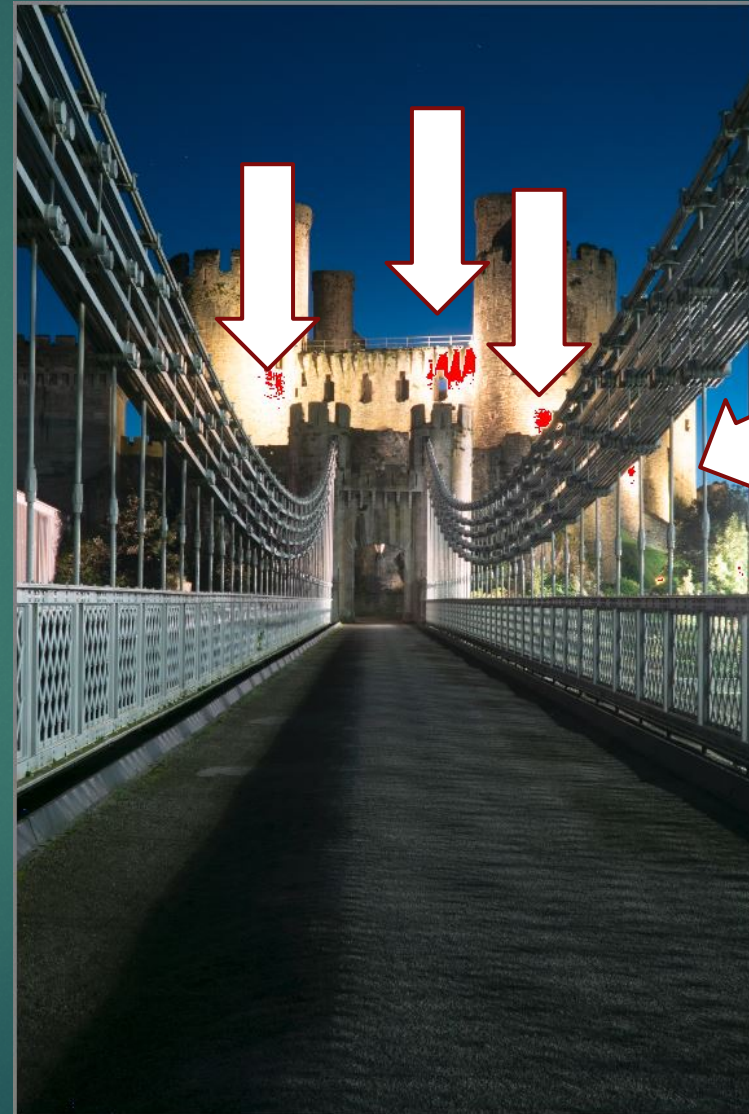
We have now increased the exposure by 1.5 stops.



Let's look at the Histogram now:

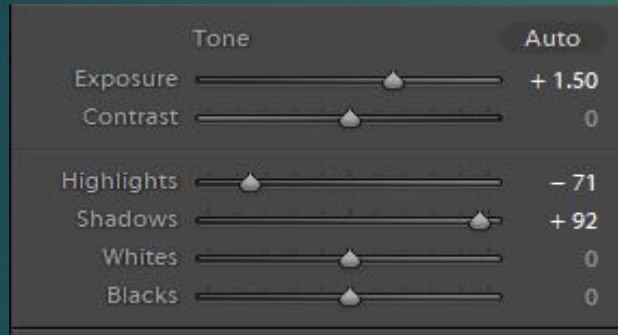


No pure blacks anymore but whites have increased.

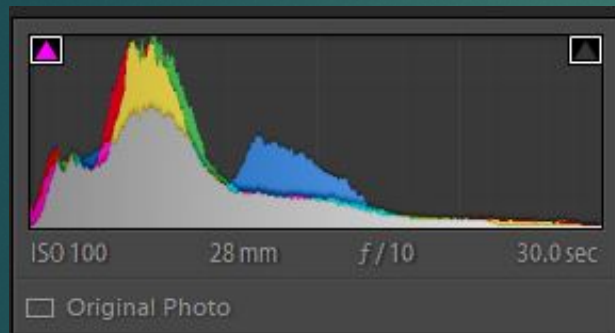


Using Histograms in post-processing

We have now reduced the highlights and increased the shadows



Let's look at the Histogram now:



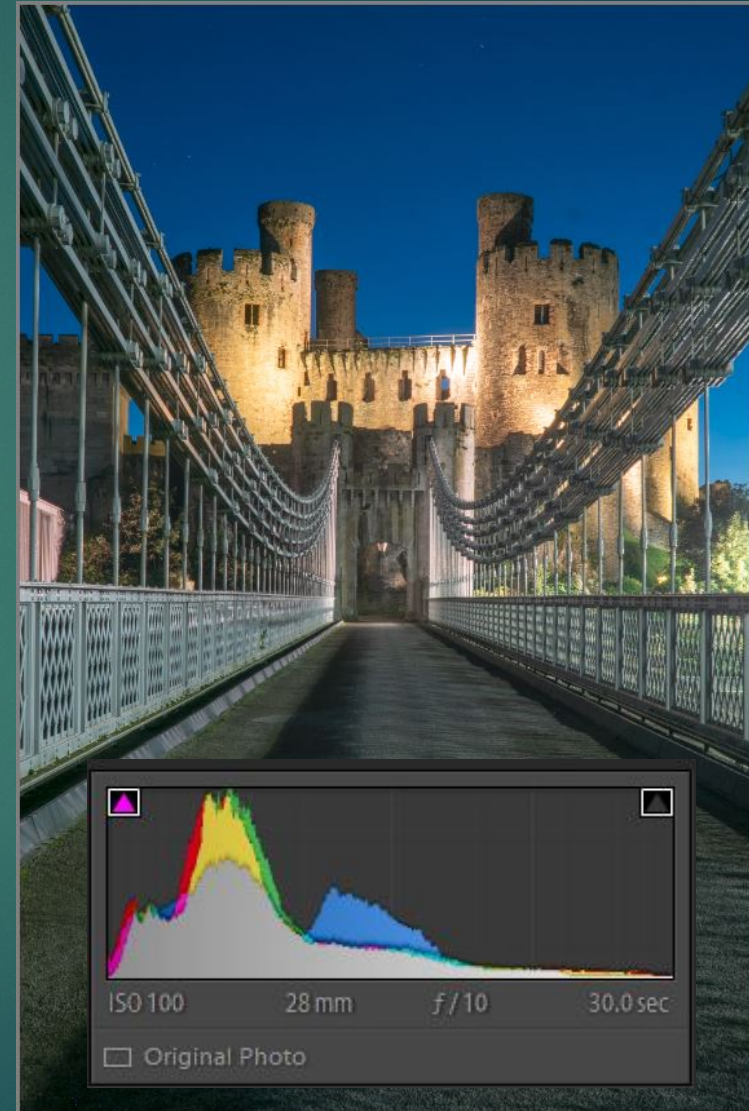
It now shows a more balanced tonal range with no pure blacks or pure whites.



Using Histograms in post-processing



In conclusion, we went from the original underexposed image on the right to a balanced exposure (bearing in mind it is a night scene) with three simple adjustments, spreading out the tonal range using the Histogram as our guide.



Last word

The most significant factor in taking any photo is to find the exposure that best suits the situation, and accentuates your intentions and the effect you're after at the same time.

There are some technical issues involved here such as the subject, the sensor dynamic range, the key parts and priorities of your image, light conditions and so on.

Although we could say that in every photographic situation there is one rendition that most people would agree upon as being the correct one, the truth is, limiting yourself to what's perceived as being "correct" and what isn't, will prevent you from achieving what you, as a photographer and individual, are really after - **self-expression and creativity**.

Enjoy your Photography!