LET THERE BE LIGHT

SOME THOUGHTS ON FLASH PHOTOGRAPHY

- **LIGHTING**
- In the early days of photography the only source of light was, of course, the sun, so most photography depended upon long days and good weather. It is said that Rejlander used a cat as a primitive exposure meter: placing the cat where the sitter should be, he judged by looking at its eyes whether it was worth taking any photographs or whether his sitter should go home and wait for better times!.
- The first artificial light photography dates back as far as 1839, when L. Ibbetson heated Quicklime to create LIMELIGHT; he made a Daguerreotype in five minutes which, he claimed, would have taken

Magnesium

- In the 1850's it was found that burning a

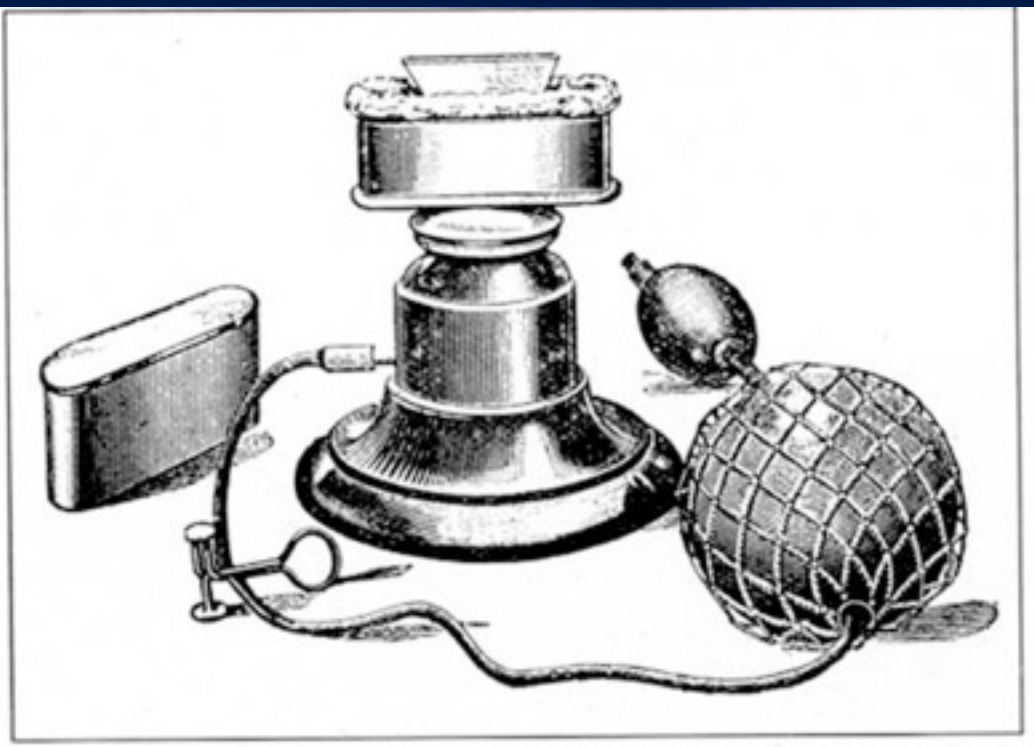
  strip of Magnesium (a metal) in oxygen produced a brilliant light that was used for lighting for photographing caves.

  Soon this form of lighting was used for

  Studio portraiture

Flash photography

- This, coupled with the introduction of dry plates in the 80s soon led to the introduction of magnesium flashlamps. They all used the same principle: a small amount of powdered magnesium would be blown, using a small rubber pump, through a spirit flame, producing a bright flash lasting about 1/15s. It also produced much smoke and ash!



Flash powder device, 1888

Magnesium powder was inserted below a spirit lamp, and the netted ball pumped up with air. When the tube clip was released, the powder was blown into the flame. This type of flash arrangement was impossible to synchronize with the camera shutter.

- Then in the late 1880s it was discovered that magnesium powder, if mixed with an oxidising agent such as potassium chlorate, would ignite very easily. This led to the introduction of flash powder. It would be spread on a metal dish, the flash powder would be set off by percussion, sparks from a flint wheel, electrical fuse or just by applying a taper. However the explosive flashpowder could be quite dangerous if misused. The smoke made up of Magnesium Oxide was also most unpleasant and slow to disperse

Certainly early flash photography could be a hazardous business. It is said, for example, that M.Riis, working during this period, twice managed to set the places he was photographing on fire!

This is a still from a U tube film made by a Texan guy who made a replica of an old flash pan, filled it with powdered magnesium and potassium chlorate and ignited it with a

Knowing how much light was needed was, as now, a problem

- By varying the amount of flash-powder, the distance covered could also be varied. To give some idea, using a panchromatic film of about 25ASA and open flash technique, at f8, a measure of 0.1 gms of flash would permit the flash-subject distance to be about 2.5 m, whilst 2.0 gms would permit an exposure 10m away.

Flash bulbs appeared in the 1920.s

- These consisted of a glass globe filed with a fine Magnesium, Aluminium or Zirconium strip, and Oxygen, and fired (as in exploded!) with electricity.

The shutter held open, the flash fired, and the shutter closed. Hence the "BULB" setting on your camera to-day.

In the 1930s the electric trigger was fired by the shutter itself….Synchronisation had arrived!!

This is my old flash gun from the 1950,s

- The bulbs were wrapped in thick blue plastic for [illegible]ow colour caste.

The bulb had 1/10th sec delay in ignition, and so the camera had a “M” connection which delayed shutter opening by1/10th sec. There was a second instantaneous “X” connection for electronic flash in later cameras.

Electronic flash

Today's flash units are electronic flashtubes.
An electronic flash contains a tube filled with Xenon gas, where electricity of high voltage, stored in Capacitors and charged with small batteries, is discharged to generate an electrical arc that emits a short flash of light.

A typical duration of the light impulse is 1/1000 second, but can be much less. The majority of cameras now have an electronic flash unit built in.

Synchronisation

- In fixed lens cameras, the Shutter is made up of a spring loaded diaphragm in the lens.
- This is manufactured to open very quickly, remain open for the designated exposure time and snap close again.
- Electronic flash is of very short duration, and is synchronised to flash when the shutter is open.
- The shutter speed setting is irrelevant in normal situations.

Single lens interchangeable lens reflex cameras are quite different.

- The shutter is immediately in front of the sensor and covers the whole of it.
- They are called FOCAL PLANE SHUTTERS

They, traditionally, consist of two curtains which move across the sensor in about 1/100th sec. One curtain starts to expose the sensor, and the second follows to cover it. Exposure is determined by the size of the gap between them.

For example if the gap is half the width of the sensor, the exposure will be 1/200 sec and only half the sensor is exposed at any moment, and a flash will only expose half the scene.

In this example the minimum exposure that which would expose the whole sensor is 100th sec.

Modern camera shutters are more complex with several titanium “curtains” working more quickly, but similar limitations will still apply.

- Don’t panic: your modern up to date camera will automatically grab the correct exposure when you switch on the flash, but you need to know the limitations.

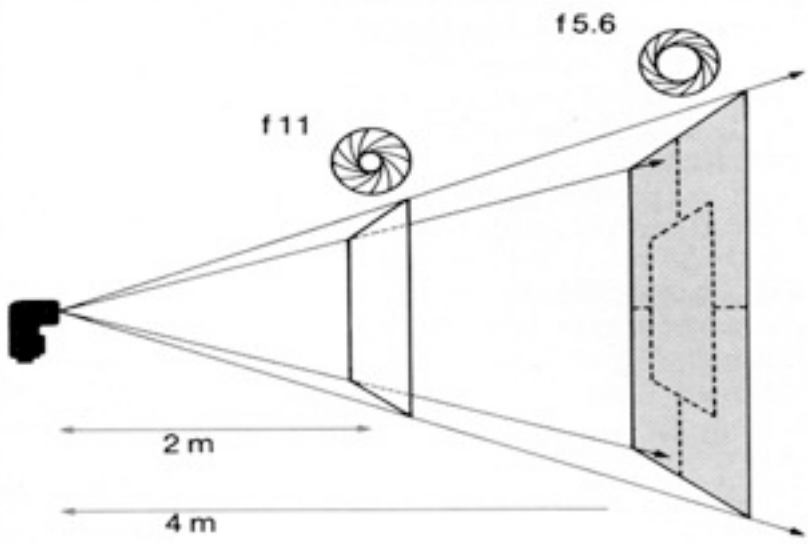
Calibration

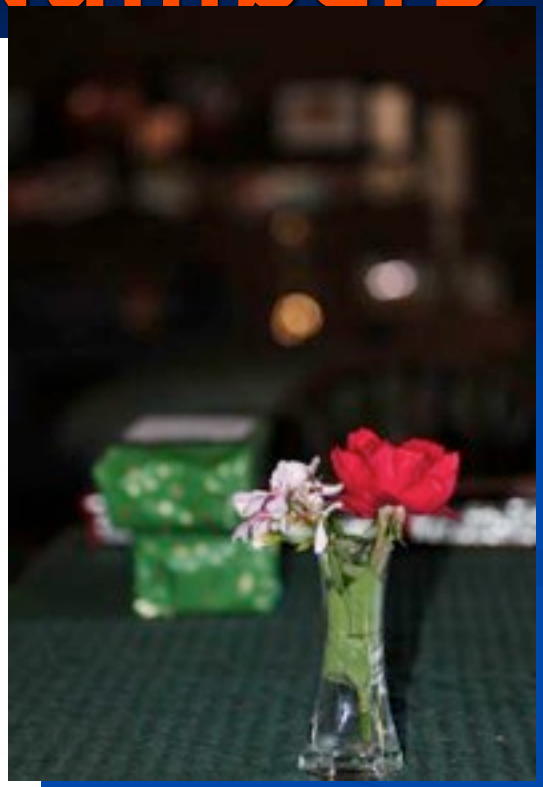
- Manufacturers allocate “guide numbers” to flash guns according to their “strength”.
- These numbers will specify a film speed, usually 100 iso and whether it is in feet or metres
- We used to have to divide the GN by the distance to the object to set the aperture, and we still may need to do so with remote flash units.
- e.g. an object 5 metres away from a GN 20 gun will need F 4 to give adequate exposure

Guide Numbers

Flash guide numbers

The farther the subject is from the flash the less light it receives, and the wider you must set the lens aperture in order to expose the film adequately. The small size of most flash sources means that they conform to the "inverse square law". This law states that doubling the distance between subject and light source quarters the light, and so you have to open the aperture two full stops (setting the aperture to half its original number). Changing distance from 3 ft (1.5 m) to 6 ft (2 m), for example,





Flash fall-off.

This illustrates everyone's experience of the relationship of light intensity and distance

The flash Gun in the Illustration has a Guide number of 22 (ie f11 times 2M). Doubling the distance requires 22 divided by 4, or f5.6. or four time the aperture.

Your camera will calculate this for you if in Auto. Mode.

Older Flash Guns

- Early guns had a printed table on the back to help set aperture.
- Then they were made with a diode sensor to detect the reflected light from the object and quench the flash instantly, perhaps after 1/10000 sec.
- We now have “through the lens” sensors which do the same thing much more accurately.

Modern Flash

- Nowadays we expect to stick the flash gun on the camera, which we set to AUTO-PROGRAM and everything is done for us. The shutter is set at the minimum setting, the object distance is measured, the aperture is set to let in enough reflected light from the object and the light is quenched appropriately and all is perfect.

Or so the handbook says….

Incorporated Flash Guns

- Most of our modern cameras have a flash unit incorporated.
- Problems with this:
  - 1. They are of low power, with a range of about 3 Metres at

    100 iso, and a tendency to provoke "noise" at higher iso values.
  - 2.They are too near the lens axis and shine light into any Eyes' retinas, giving "RED EYE"
  - 3. They cannot be angled, or "bounced"

- Christmas is here……Buy a SPEED LIGHT!!!

Advanced flash techniques

- Aperture preferred Automatic settings. You may want to exploit depth of field effects, and suddenly you need to understand Guide Numbers.

- You may need to go fully Manual, and the same applies.

Bounced Flash

STRAIGHT FLASH.

Harsh light. Background shadows.

Reflections and Uneven brightness.

BOUNCED FLASH off White ceiling

No, or soft shadows and even gentle tonal range.

BEWARE OF COLOURED SURFACES!!

“SLOW- SYNCH”

- This is a technique of using a LONG exposure at night with flash. This allows background detail to show through, rather than inky black

Rear Curtain Flash

- Normally ,with front curtain flash, the gun fires immediately the shutter is fully open, even though the exposure chosen may be much longer.
- With rear curtain flash the gun fires just before the rear curtain moves to cover the sensor.
- If you are using “slow-synch” as well this allows a retreating car to keep ahead its rear lights rather that drive through them, for example.

- You will need a tripod.

Rear curtain flash

With normal flash (front curtain) the rear lights, in this example, leave an image after the
car has been flashed. With rear curtain flash the car is flashed later and appears to precede
the light trail. This shot was probably taken with a longish shutter speed to record the car
movement and background detail (slow sync).

Rear-curtain sync

Front-curtain sync

Fill flash

- This is using balanced flash in full day-light if the object is back lit or has heavy shadows from harsh sunlight.
- This used to be a bit of a gamble, and I used to set the gun at a faster film speed to make it under expose and give a natural balance.
- Look at some press photos and see how they can over-expose fill light and make the subject look artificially bright, like I used to do.
- Now its all done for you with the correct camera and flash settings. The camera will expose correctly for the background and release enough flash to lighten the shadows

NO FLASH.

Correctly exposed window

Black foreground

AUTOMATIC BALANCED FILL FLASH

Both the window and the flowers are properly exposed

Off Camera Flash

Flash guns can be fired remotely.

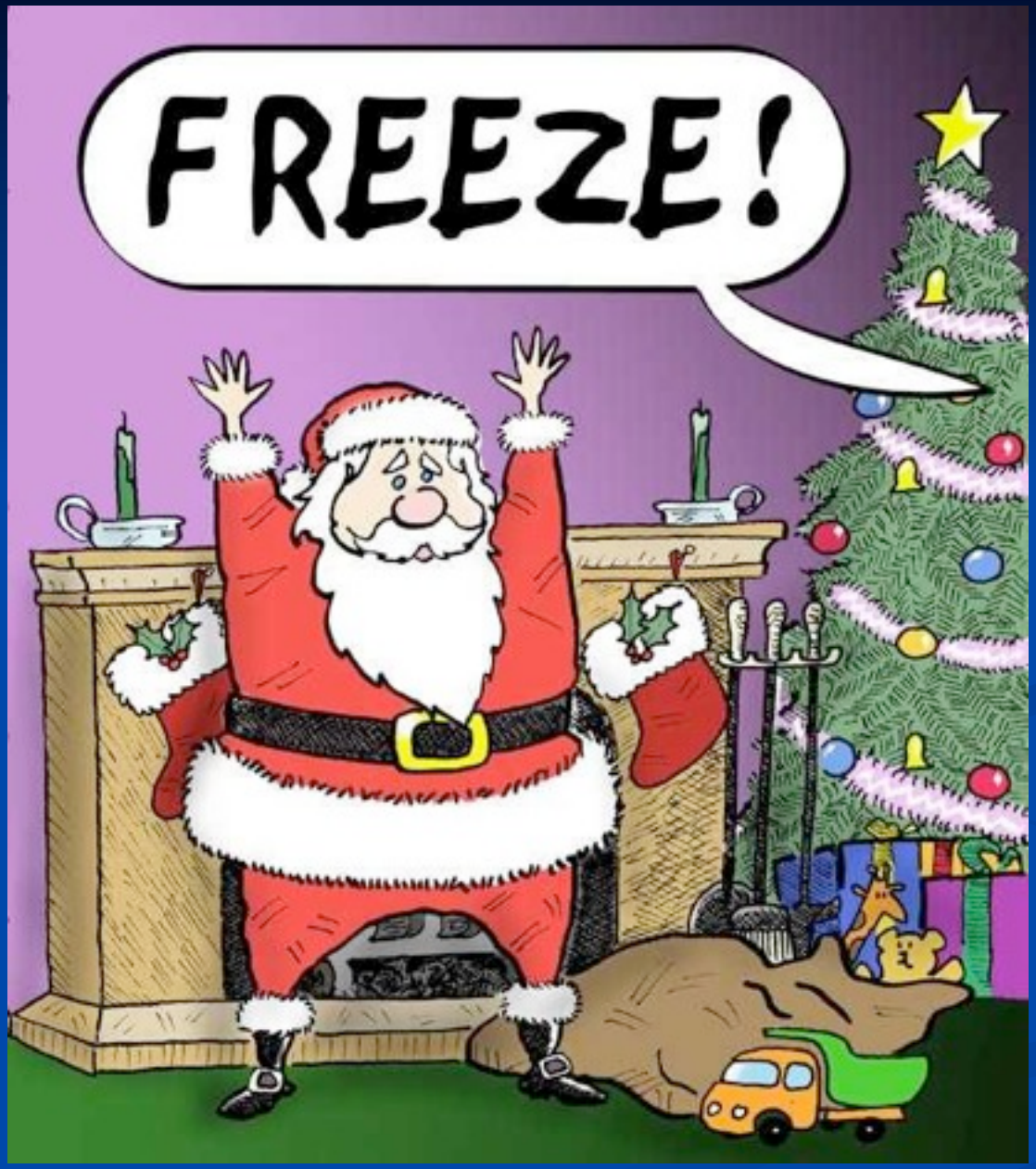
I used a extension cable for this to give a more contrasty print with modelling shadows and dimmer background.

Modern cameras can fire multiple remote flash wirelessly and this has been demonstrated at previous meetings.

Shadows can be a little hit and miss, and Portraits need careful placing of the nose shadow and precise fill lighting to look “right”.

Studio flash units have a modelling light incorporated to achieve this, and are moved about to adjust relative brightness using the inverse square law.

Flash Meters *are placed near the subject and indicate the correct Aperture to use after a trial flash.*



Have a

Great Chrismas

and

Best Wishes for

2010