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*Photo: Bart Mulder*



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## FROM DUSK TO DAWN

*Photography in Poor Lighting*

### Midsummer night

What is twilight?—The light diffused over the sky after sunset and before sunrise (especially, in popular use, the former) which is caused by the reflection from the higher portions of the atmosphere.

The term could also be defined as follows:

“Evening twilight begins at sunset and lasts until the sun is 6° below the horizon, when faint stars begin to appear (in clear weather). The reverse applies in morning twilight. During twilight, it is normally light enough to permit the reading of ordinary print in a book or newspaper.”

The closer a site is to the earth's poles, the longer the duration of twilight. Thus, an almanac notes that twilight in Copenhagen, Denmark, for example, at 55° north lasts approx. 50 min on May 15th. But twilight lasts 2 hrs 12 min in Haparanda in northern Sweden on the same date. Here are 3 experimental photographs taken on a June night in Göteborg (in southwest Sweden) half an hour after sundown. The Hasselblad magazine was loaded with High Speed Ektachrome film (160 ASA). Both reflected and incident light meter readings were taken of a subject mainly consisting of water and sky. Both readings indicated f/5.6 and f/8 as suitable apertures with a 1 s shutter speed. A test series was made at f/4, f/5.6, f/8, f/11, f/16 and f/22. The latter apertures produced more night than twilight. F/11 and f/8 resulted in projectable, appropriately murky images. At f/5.6, the water was rendered paler and the horizon less pink. F/4 produced a weakly saturated “daylight” image. Thus exposure is vital to color rendition. “Right” color is too much to hope for.

Cover photograph: Peter Johnson/Moonrise in The Antarctic. (Note: Moonrise and sunset at the same time.)

Photo left: Ulf Sjöstedt.

Twilight backlighting makes terrestrial subjects look very dark. But there may still be enough light for a picture even after sundown.



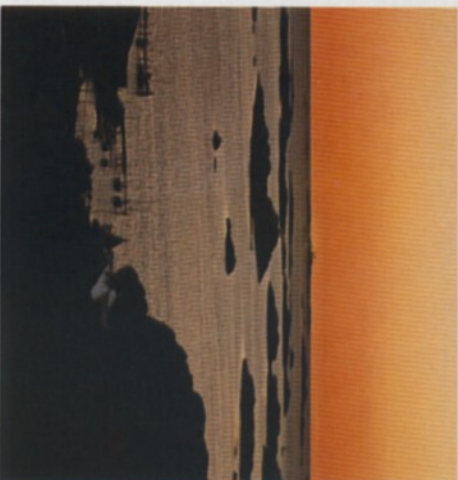
1 s at f/16



1 s at f/8



1 s at f/4



1/30 s at f/8

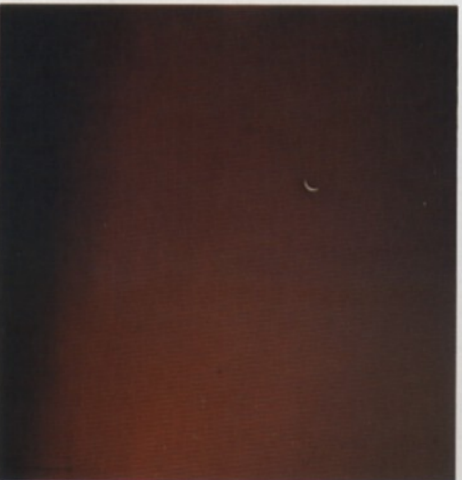
**Afterglow**  
There is a special charm in the afterglow which sometimes persists in the sky after sunset on summer evenings. Islets and skerries become silhouettes, surrounded by blue-black water, in the weak backlighting (upper photograph). The beacon in the background is 6 miles from the island from which the picture was taken.

Hasselblad 500C/M, 250mm Sonnar lens and tripod.

Afterglow may be extremely bright. In the center photograph it forms a striking backdrop for the moon crescent and a planet. Exposure: 1 s at f/8 on an Ektachrome-X (64 ASA) film.

#### Silhouette

Twilight can also cast shadows (bottom photograph). Here a man on a quay, awaiting a boat whose white masthead lights and green lamp shelves indicate that real daylight is gone. It was so dark that an exposure of 1/30 s at f/2.8 was necessary for the hand-held shot (this speed is normally too slow for hand-held work but can be successful if shutter release is sufficiently gentle). The large f/stop made it impossible to get both the man and the boat sharp. So the lens was focused on him. The variation in sharpness between him and the approaching boat emphasizes the distance between them.



1 s at f/8

#### Midnight

You can't take a picture on a pitchblack night. There must be some contrast, such as tree silhouettes against a trace of light in the northern sky (picture upper right). The photograph was taken by a lake at midnight. The wind was too gentle to rustle the boughs much in exposures at 5 and 10 s. The camera on a tripod, of course. F/2.8 on an Ektachrome-X (64 ASA) film.



1/30 s at f/2.8

#### Narrow reflection of the moon

In the Faroe Islands the sun is called the "big light" and the moon the "little light". The light referred to is actually the same in both cases, the moon only serving as a mirror of the sun. A very small mirror though—only reflecting 1/150 000 of the light falling on it. So exposures have to be long.

The fishing village in the moonlit photograph in the middle was a mile away. Hasselblad 500C/M with a 150mm Sonnar lens. Houses can be discerned in the projected image.

The streaked moon reflection is narrow here because there was no wind. The surface of the water was then unruffled and could serve as a mirror. A pure reflection of the moon on placid water would be dull unless the monotony were disrupted by islands, quays or boats. Here, the boat silhouette seen is sharp, despite the use of f/4 with a 10 s exposure. This shows how still the water was that night. The spots of light in the fishing village are white or red. The red spots are ordinary incandescent lights and the white spots are mercury vapor lamps which cast a greenish light on the houses. A few unmoving clouds touch the disc of the moon. Like the moon reflection they are red from underexposure.

#### Broad reflection of the moon

A slightly ruffled water surface can produce a very broadly streaked reflection of the moon. This is because the water rings serve as moving mirrors reflecting the moon more unevenly than is the case with a flat water surface.

The photograph at the bottom also shows that the slight wind movements failed to ruffle the water to the same extent everywhere. The glitter displays moon streak in places where there was little or no wind.

Exposure: f/4 at 12 s on an ASA 64 Ektachrome-X film; Hasselblad 500C/M and 150mm Sonnar lens.



5 s at f/2.8



10 s at f/4



12 s at f/4



### Playing with globes of light

The way in which a lens depicts reality makes it possible for us to use a camera viewfinder to search out images completely different from those seen by the human eye. The different colored globes of light here are street lamps as rendered by a lens focused on a nearby object, in this case the flowers to the right in the photograph. You can duplicate the same effect by aiming your camera at some points of light on a dark night and setting your focus at the "wrong" distance. The greater the degree of focusing inaccuracy, the more exaggerated the effect.

The globes have different colors for the same reason explained above for street lights. The flower group was illuminated through the window by ordinary incandescent lamps.

### Extremely long exposure produces a daylight effect

Moonlight was described above as being rather weak. That moonlight photographs could still be taken with exposures of only 10 or 12 s was because the subjects actually only consisted of light reflections and points of light, as well as the moon itself. A kind of extreme backlighting.

The moment you turn your back to the moon and begin to use its light to illuminate outdoor subjects, exposures have to be very long, even when there is a full moon. An exposure of 5 min at  $f/2.8$  with an ASA 160 High Speed Ektachrome film produces a very murky night shot. But a 40 min exposure produces a daylight effect which is quite different from the image of the subject as perceived by the eye at the moment of exposure. This is because film is capable of "storing" light impressions, as is not the case for the human retina. The authenticity of both photographs as night pictures is shown by the star streaks across the sky. Long streaks during the 40 min exposure and very short streaks during the 5 min exposure.



5 min at  $f/2.8$



40 min at  $f/2.8$

### The firmament as a subject in motion

From our point of view the firmament is a subject in motion. So stars are streaked on the film as long as a camera shutter remains open. (Set the shutter at B with the coupling, the time exposure lever set at T, and use the largest possible  $f$ /stop). Hour-long exposure produces arcs whose curvature increases the more the camera is aimed toward the North Star. Keep in mind the direction of the stars' apparent movement and leave space on the film for this motion. Take your pictures on dark, clear nights which from a spot at no light from any nearby community illuminates the smoke-laden, possibly moist air. No terrestrial spots of light should be included in the picture since they would then be severely overexposed. Tree contours can provide "ground contact".

The upper photograph was exposed for a whole hour. The stars then had "painted" lines (1/24 of a circle) in a decorative pattern. A few constellations could be recognized when exposure was interrupted after 15 min. (Exposure lasting only a minute or so would only render the stars as dots.) Easily recognized constellations in the Northern Hemisphere are the Big Dipper, Orion and Cassiopeia, its W formed by 5 stars. The constellations mentioned can be photographed with the standard focal length lens.

### You can paint with light

The constellations show that a luminous point in movement produces a line on the film. The young man in the bottom photograph has a small, innocuous sparkler in his hand. It generates bright sparks for about a minute. He is using the sparks to "paint" a circle of light in the air in front of him. The shower of sparks is relatively close to his face but is too weak to light up his whole body. A flash was therefore employed to provide fill-in illumination of the body. The shutter was then closed.



1 hr



15 min





*Photo: Studio Millies*  
 The flames inspired the photographer into arranging a still life using candles. Some of the effect created is to be found in the intentional sharpness of the foreground candles and the recession of the other candles into soft focus.

### Candlelight and mood

The gentle flame and warm light of candles often convey a mood of peacefulness. That is why they are often included in pictures, which seldom is the case with other sources of illumination. Flames must be straight, so you have to wait by your tripod until air currents in the room have stilled. A void drafts and hot air billowing from radiators. The slightest air movement can deform candle flames. Exposure readings should be made of the subject, not of the light source.

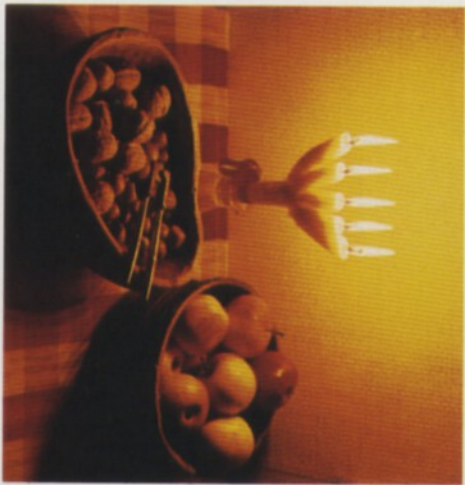
A slight underexposure (upper photograph) emphasizes the five flames, and the mood is enhanced by the murkiness. But the bowls remained dark since the room had no other source of light to fill in the shadows.

The photograph in the middle is the result of a longer exposure, spreading light across the entire scene. The apples and nuts have been enhanced, but the shadows have also received due emphasis. The flames have blended somewhat into the light wall. A set-up further away from the wall would have reduced light on the wall, increasing contrast between flames and wall. The lens here was stopped down to  $f/8$  in both shots so that the entire image could be in focus. Small aperture, large depth-of-field!

Portraits in poor lighting call for the use of the maximum lens aperture so that exposure duration is conveniently brief for the model. A large  $f$ /stop demands careful focusing. You can make continuous checks on focus right up to the moment of exposure. The model should be supported well enough to avoid wobbling out of focus during the exposure. The model should also be warned just prior to shutter release. This will prevent e.g. blinking at that critical moment.



*1/2 s at  $f/8$*



*2 s at  $f/8$*



*1/2 s at  $f/2.8$*



### Interiors seen from the outside

You can photograph a lighted room through its windows, letting the latter frame the image. This may take a wide-angle lens for a window as wide as this. Reflected light measurements are made indoors of one of the lighted walls, not of the flames. You have to put up with a long exposure if an aperture is used which is to enable room details to be rendered in sharp focus.

The people in the room require brief exposures, so flash fill-in will be necessary. But the fill-in flash should not be powerful enough to spoil the Christmas mood in a picture like this. The solution is usually to bounce the flash at a wall or the ceiling not fully visible from the camera site. This type of lighting illuminates a very large wall area which serves as a reflector producing softer, more wide-angled and more shadowless light than that of a flashbulb. This kind of reflected lighting is the counterpart of the soft lighting from the sun on a hazy day.

The photographer set the lens at B, opened the shutter, signalled an assistant holding the flash to fire away and closed the shutter. Making such window shots is much easier if the interior illumination is bright and well-designed for the room in question.

In the picture at the bottom, a number of winter tourists are sitting in a mountain cottage, completely unaware of the photographer. All are busy watching television. Here, it was impossible to get through yard-deep snow with a camera tripod, so the picture was taken from a plowed parking lot using a 150mm Sonnar lens. An exposure reading was made off the wooden wall at the rear of the room.



### Reportage at home

If you get your children accustomed to strobe "blasts" every now and then, you will find it easy to get relaxed, natural family pictures. The flash can be attached to the camera here, since too many shadows would be unpleasant in color photographs. Color has to provide the contrasts instead.

Reportage at home is especially rewarding in families with many children. There is one opportunity after another from morning to evening, as the kids wake up, get up, eat breakfast, leave for school or kindergarten, come home again, play, make music, read, play with dolls, watch TV, play with mom and dad, help in the kitchen (especially during holidays), go to bed, fall asleep. Bath, shower, listening to music, telephone calls ...

All parents know that a lot can happen before youngsters are safely tucked away in bed. Innumerable ceremonies can delay this event considerably. Why not take a series of photos? Here is a somewhat abbreviated version as an example.

1. If a stocking has to be taken off by a window, remember that a window pane can reflect light as readily as a mirror.
2. Washing up can take a long time. Use this time to shoot from different angles and with different lighting. Tiles are highly reflective, and the lens can often be stopped down more than the flash guide number indicates.
3. The final objective is achieved (unless, for example, the child decides that one of its dolls is thirsty).





#### Flash bounced off walls

A flash fired off near the lens can produce shadowless lighting, since flash and lens "see" the same thing. For the profile shot to the right, a 13 ft extension cord was connected between the camera and flash so that the latter could be aimed at the model at an angle of 90°. But the flashlamp itself was pointed towards a white wall to the left, illuminating an area of about a square yard. This illuminated area reflected soft, shadowless lighting onto the girl.

When calculating your *f*/stop on the basis of a flash guide number, you have to keep track of the path of the light; in this case from flash-to-wall-to-girl. In such cases, you should increase the aperture by at least a half stop. Experiment! Avoid bouncing light off brightly colored walls, since their color will also be reflected.

All these pictures of children were taken on daylight film, which is balanced for the light produced by electronic flash.

#### Fake fire

The glow from a fireplace is usually too weak a light source for snap-shots. This fireplace photograph was intentionally faked. The children are playing with their spits. The light is actually emanating from a flash in a cold fireplace. The firing cord is hidden in the firewood.



#### Flash in rain and snow

The flash was close to the lens during the snowfall shot (bottom). The snow flakes were then illuminated very intensely. They also were greatly enlarged because the most brightly illuminated flakes were in the least sharp zone of the lens field. The case is the same with rain drops. The effect disappears if the flash on an extension cord is shifted 2-3 yards to one side of the camera.



Photo: Ulf Sjöstedt





**Light has different colors**  
 People switching from black & white photography to color soon discover that things perceived as white by the eye may actually be reproduced in completely different colors. In the evening, incandescent light is usually perceived to be white. But this same light looks yellowish in a room illuminated by daylight.

To illustrate this point, two day and night shots, taken of the same lantern made of wood shavings and using the same daylight color film, were paired. Illuminated by sunshine during the day and by its own light source at night against a black sky. And clearly a reddish yellow. The change from a strong yellow hue in the middle to a red shape at the tips is because of the declining light intensity producing underexposure of the tips. The duration of exposure and the aperture are decisive to color saturation. An underexposed or nearly underexposed color film frame has more saturated color than a normally exposed or overexposed frame. A difference amounting to only a half stop may make a vital difference. That is why several test exposures should be made in doubtful cases.



**Day and night**

The pictures of the oil refinery were taken during the day and at night from the same site. The subject in the daylight photograph was evenly illuminated by the sun. At night, however, a pattern was formed by the colors of the various lamps. The night picture is no longer a depiction of a plant. Refinery illumination has been used to produce a purely photographic effect. Each of the lamps is only capable of illuminating a tiny area in its immediate vicinity. Therefore, many photographically uninteresting parts of the rather "fussy" daylight shot are mercifully obscured by darkness.



The pictures aim at illustrating the general difference between day and night photographs and showing that a night picture can consist in a whole pattern or part of a pattern of light dots. This pair of photographs also shows that daylight and night photography employing artificial light sources are two different worlds calling for different ways of seeing things and different photographic techniques.

**In the dark of night**

When the last trace of daylight has disappeared pure night photography procedures must be employed. The subject is then often set off from the darkness by its luminosity.

The church we selected had its walls illuminated with 300 W lamps, 3 or 4 in each group. A pair of lamps in the cemetery were located to the left and right of the camera. The pictures were taken with a 150mm Sonnar lens. A lens with this long a focal length only "sees" a narrow portion of the subject, making it possible to avoid inclusion of e.g. the lamps in the foreground. Long focal length lenses also have long lens shades, making it easier to prevent extraneous light from entering into the lens.

Reflected light measurement of the brightly illuminated church walls indicated a 1 s exposure at f/4 on Ektachrome-X (64 ASA) film. Exposure measurement of white surfaces may lead to underexposure. The wall hue here is therefore yellowish. Whiteness was only obtained after a 3 s exposure which also lightened the roof. A 6 s exposure (bottom photograph) produced white walls and a light red roof.

The underexposed slide could also be shown in a projector. The photograph preferred depends on what you were after, a "correct" color or an effect.



2 s at f/4



1 s at f/4



6 s at f/4





**Car headlights as a source of illumination**  
 A subject turned up in front of us while driving on a winding country road. The top photograph illustrates the situation. In the darkness the car becomes a silhouette; its tail lights and their reflection in the wet asphalt provide the color in the fall terrain.  
 Reflected light measurements were made near the milk can stand. They indicated an exposure of 2 s at  $f/4$  on Ektachrome-X (64 ASA) film. This exposure plus one 4 s exposure proved acceptable. But one made at 8 s (just to make sure) resulted in overexposure of the milk can stand.

2 s at  $f/4$

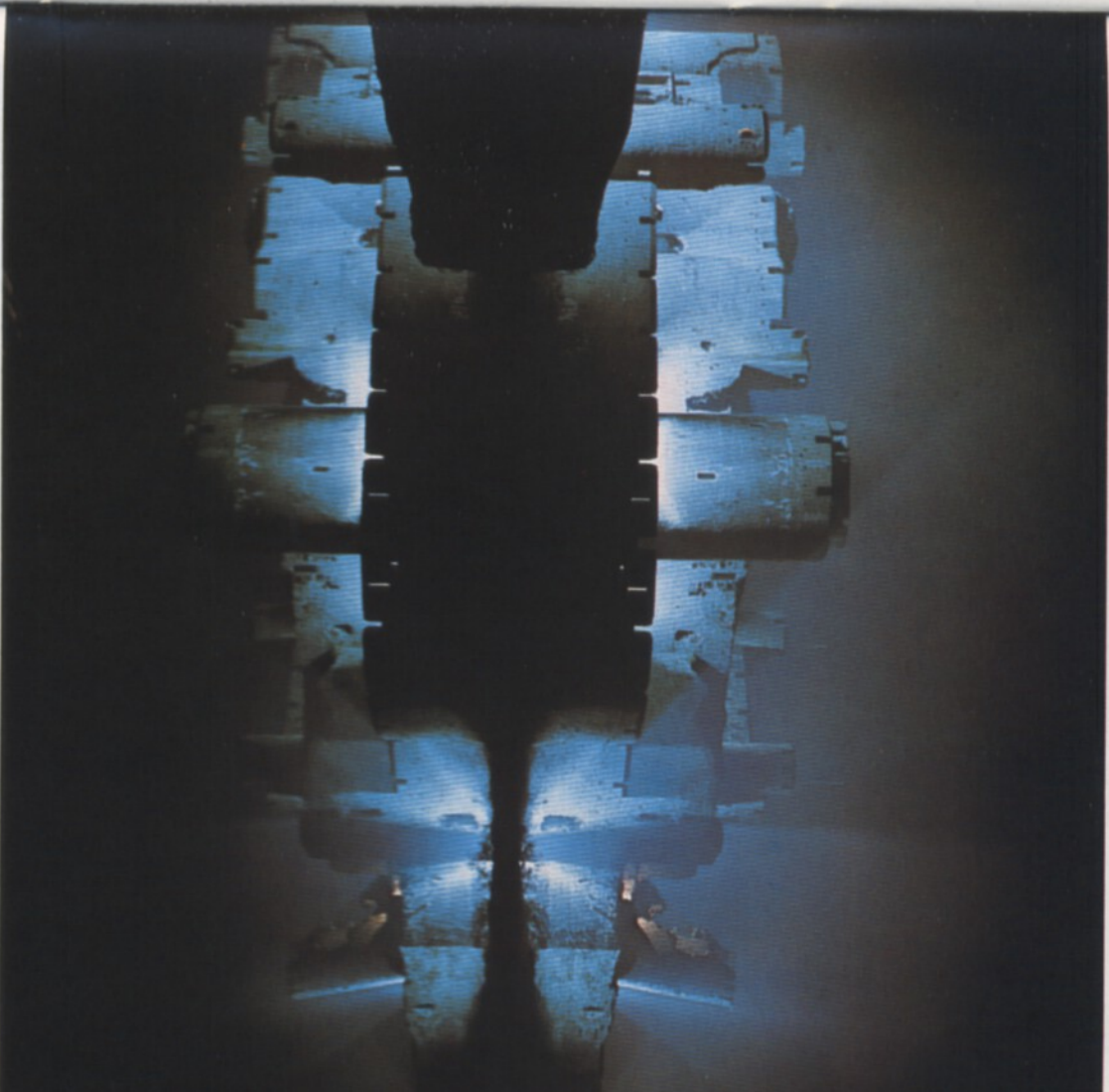


**Right light for the right film**

The reddish yellow hue of the candle and incandescent illumination was exaggerated by the daylight film, which is balanced for a "cooler" daylight. Color rendition is most accurate when the film used is balanced to the light source. Type B color film, for example, produces the truest colors when used with studio type lamps (3200 K). The combination of type B High Speed Ektachrome and a Photoflash B lamp was used in photographing the artist Allan Andersson at his easel. The bottom photograph was taken in the same lamp light but on *daylight type Ektachrome-X*. Film and light source are not balanced here. The painter's blue shirt has become brown and his hair has shifted from grey to yellow. The reddish yellow cast might have been acceptable in a portrait. But the results with type B film were better, since his painting was also to be depicted.

Blue expendable flashbulbs or electronic flash are suitable sources of artificial illumination with daylight type film. This can be seen in the pictures of children on page 12-13.

The remarks above show that the results of color photography depend both on the subject's color and on the color temperature of the illumination.



**Photo: Colin Moynaux**  
 "Cold" daylight type film used with a "warm" light source produces exaggeration of warm colors. The technique used in shooting the castle in Caerphilly, Wales, was just the opposite. A "warm" type B film was used in combination with a "cool" illumination. The result was a spooky, rather theatrical chilliness.



3 s at f/14

**Canal boat in a lock**  
A tourist boat on its way by night through the Göta Canal between Göteborg and Stockholm. The photographer had to wait until the boat had settled down in one of the locks, otherwise every point of light would have been reproduced as a line instead of a dot. A mercury vapor lamp in the center of the field casts greenish light onto the sides of the boat and canal. The boat's own incandescent lamps give off a yellowish glow, as is also the case for its spotlight aimed toward the trees to the right. The beacon is covered by red glass.

**Yellow sodium light, red grass**



15 s at f/16

Sodium vapor lamps suspended in lines over a bridge in Göteborg, Sweden (middle). Their light gives objects on the ground a reddish cast. The lamps themselves seem to be yellowish white here due to overexposure. However, mercury vapor lamps along the side of the bridge produce a cold, green light. In night pictures one often attempts to emphasize traffic intensity by leaving the shutter open for a long period of time and exposing with a small aperture. In this case f/16 at 15 s. The tail-lights in the right lane are snaking red lines. The headlights of cars *approaching* the camera from the left are depicted as white lines. Unbroken white lines to the far left show that two cars were in these lanes at the time the exposure began. Ektachrome-X (64 ASA), Hasselblad 500C/M, 150mm Sonnar lens.

The same sodium lamps illuminate a lawn. On daylight type film it is rendered red (bottom photograph). There is green only in the minor shadows. F/4 at 4 s. Film: 64 ASA.

So lighting and film which are not balanced for one another can actually give us grass which is both red and green.

**Too many lamps**

The night photographer's problem in urban areas is not the absence of light but the overabundance of light points which can add distracting elements to pictures. The top picture is a fountain in Göteborg with symbols of the five continents. Here, there was not a single camera site from which the fountain as a whole could be reproduced. Street lighting, store windows or neon lights always were in the way. One solution could be to work in the middle of the night when store lights at least are turned off. Here, the camera had to settle for a detail of the fountain with no source of extraneous light shining into the lens. That is why little "Africa" is alone on a perch in front of the large urn (middle).

**Making light points vanish**

The many points of light around the Carl Milles sculpture "Dancing Girls" in Göteborg (bottom) have disappeared in the right shot, thanks to a slight but carefully selected shift of the camera. Using this method, intrusive objects or points of light can be shifted outside the image area or hidden by the main subject. The large, 2 1/4"-square focusing screen is a big advantage then. Careful, corner-to-corner checks made on the focusing screen eliminate surprises in the darkroom.

The area around the sculpture is illuminated by seven "cold" 7000 W mercury vapor floodlights and one separate 2000 W "warm" floodlight. Light from the latter just touches the right dancer and lends the veridigris a red tone. Daylight type High Speed Ektachrome film.



4 s at f/14



4 s at f/14



2 s at f/14



15 min at f/4

**Green street lights**  
The pictures on page 18 showed that the light from sodium vapor lamps is reproduced *red* on daylight type film. A mercury vapor street lamp with *green* light is the subject here. Exposure: 15 min at *f/4* on Ektachrome-X (64 ASA). The distance from the lamp to the table on the lawn is about 20 yds. The long exposure gives an impression of near-daylight. But the streaks in the sky can be recognized as stars. The yellow incandescent lamp light in the windows also discloses that it is night.

**Amusement park**

Moving light night subjects, whose photographic effects depend on the duration of exposure, can be found at amusement parks. The ferris wheel's shaped incandescent lamps and colored gondolas moved only slightly during exposure. There is a merry-go-round at the bottom left in the photograph. During the exposure it rotated enough for its lamps to be reproduced as rather long lines. An explanation is needed in the caption if the viewer is to understand that the blur is actually a merry-go-round.

**Fireworks**

Moving lines of light are also a feature of fireworks. The technique is to place the camera on a tripod and aim it towards the sky where the explosions are to take place. A camera site should be chosen so that smoke does not drift towards the photographer. All exposures are made with the shutter set on B. The length of time to keep the shutter open depends on the number of rockets etc. desired on each film frame.



**Dawn**  
Photographs can be taken in the light of even the faintest of dawns, i.e. as soon as there is a silhouette (a skyline in the top photograph) to juxtapose against the sky.

However, dawns are seldom photographed. This may be because many of us are not too keen on getting up early. The coldest time of day is also often during the early morning hours.

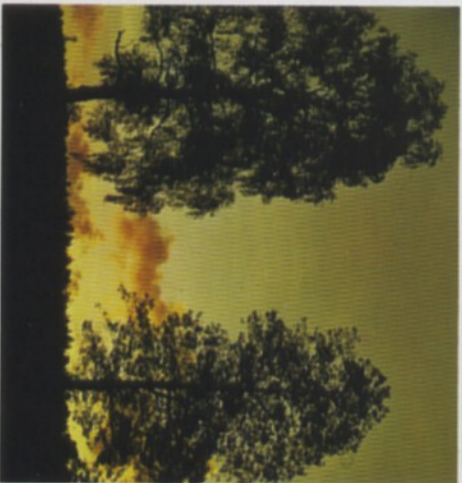
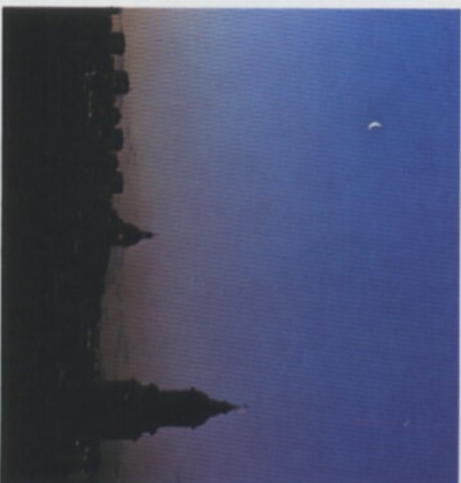
**"Underexposed" dawn**

Seen from the camera site, the sun had not yet risen above the horizon, but the clouds were already illuminated (middle).

An exposure of 1/100 s at *f/11* was chosen in order to capture a feeling of dawn. This would have been a normal exposure for a subject illuminated by sunlight during the day. The result at dawn was, as asked for, an underexposed landscape silhouetted against a colored sky. "Incorrect" exposures of this type can be useful, especially for subjects with wide variations in light intensity and when the most brightly lit areas are the main subject. Other parts of the subject then are lost into the murkiness of underexposure.

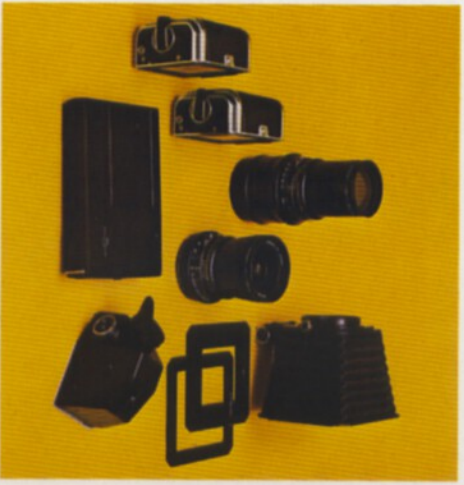
**Illuminated contour**

Somewhat later, when the ground is illuminated by weak sunlight, we find ourselves at the definite limit for daylight photography. The "red" time of day then starts about which film manufacturers sometimes warn. But if the "wrong" color light could be used for night photography, then why not the genuinely red morning light found at sunrise?



1/100 s at f/11





### Suitable equipment

The pictures illustrating the text in this booklet were taken with a Hasselblad 500C/M. Both the 80mm Planar and 150mm Sonnar lenses were used, each with the lens shade designed for it. Since focusing is especially critical when the lens is used wide open, a focusing screen with central grid was used. An exposure meter was necessary to provide some idea about exposure. Since most shots were long time exposures, a tripod quick-coupling was used to facilitate rapid removal and attachment of the camera.

Photographers who like (or need to have) a fast check on exposures under hard-to-judge conditions, can supplement their equipment with a Hasselblad magazine for Polaroid film. A Professional lens shade in the form of a bellows is indeed larger than ordinary lens shades but it is also especially effective. A meter prism finder is another innovation in the Hasselblad system. The Hasselblad catalog also contains information on other magazines and lenses than those mentioned above. Flash attachment devices are available for use by photographers who prefer to hand-hold their flash-guns during flash work. A is a flash-gun bracket with cable release, B is an adjustable flash-holder fitted onto the lens shade and D is an adjustable flash-shoe to be attached at the side of the camera body.

*Photo: Joachim Pfaff*

*In the same picture the photographer utilized both rosy dawn at the horizon and the sharp green contrast provided by the mercury vapor lamp.*

