- If the subject is *translucent* (e.g. frosted glass) we shall see structure and surface details silhouetted – probably with a centr hotspot.
- And if the subject is *transparent*, the camera will be looki straight into the lamp, and see little else.

If you move the light from this dead-back position, towards 1H 11H it will begin to illuminate the side edges of the subje progressively emphasizing its outline there. Within an angular ran of around 10–11H and 1–2H the edges of the subject are m effectively lit, and here we have the regular positions for *three-quar back light*.

Lamp height

So far, we have been talking about positioning a light source around lens height – i.e. *level* lighting. There will be times when y have little option but to light a subject in this way; e.g. with a la attached to your camera or held in the hand. But apart from clos work, such as a model on a table, level lighting can have re disadvantages:

- Frontal lighting at camera height will cast the subject's shad onto the background behind it. This shadow will increase in s with the background distance.
- A person will be dazzled by level frontal lighting.
- A lamp located at around 10H to 2H will shine straight into t camera lens unless you take care to mask off the light.
- A lamp supported at camera height is vulnerable. It is eas knocked out of position, and people (or cameras) can inadverte ly move in front of it.

Apart from these limitations, you will usually find that lightin from a level position does not provide the optimum effect. Instead you will see, most lamps, whatever their direction, need to be so distance above the floor, shining down at the subject.

Let us look, now, at what happens when a lamp is *raised* above le height. As you would expect, the visual effects are similar to those w have just discussed when moving the lamp *round* the subject; exc that now shading and shadows progressively grow *downwards* as t lamp is raised. Its shadow is cast down towards the floor.

If the light is falling on the subject from above it will be edge li contours and texture being emphasized. With odd exceptio overhead or *top lighting* is seldom attractive, and only suitable wh you want to isolate the subject in a localized pool of light.

When you *lower* a light from a level position to shine *upwards* on the subject, shading and shadows progressively grow upward Shadows are thrown up onto the background. Although this eff may be appropriate enough when simulating a low light source (e.g

firelight), results from low-level lighting are usually strange, even bizarre, and only really suitable for highly dramatic situations.

Basic lighting principles

Lighting a flat surface

At times you will want to light flat surfaces unevenly, for shading or patchiness can make them look more attractive. But there are situations where any unevenness would be unacceptable – e.g. when lighting a title card, graphic, photo blow-up, skycloth.

The *edge lighting* that so effectively showed surface relief on a coin, or the texture of a brick wall, would reveal all wrinkles, bumps, and creases in a cyclorama!

The *frontal lighting* that can produce a flatly lit cyclorama would reflect in a shiny background or an oil painting.

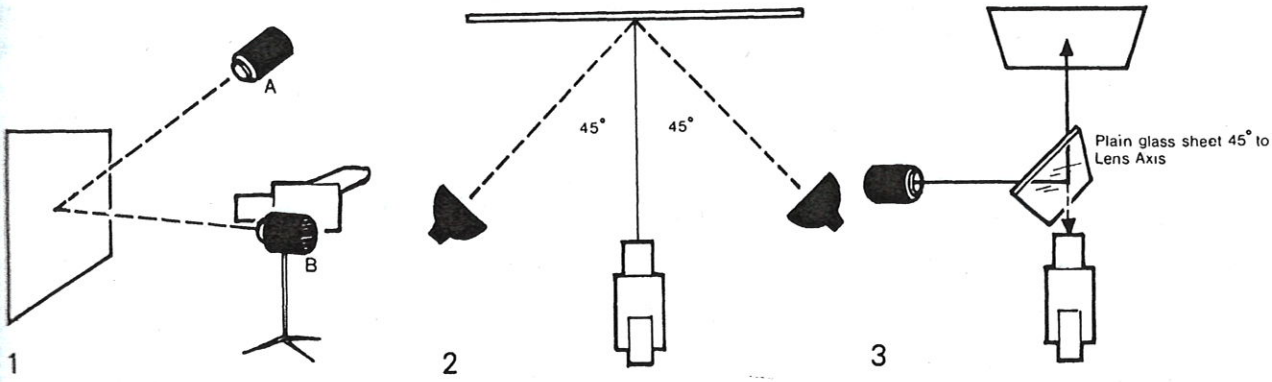

Fig. 4.6 Lighting a flat surface
1. Light from a frontal position near the camera (B), may reflect to produce hotspots, flares. Offset at (A) will overcome reflections, but may cause uneven illumination.
2. For critical work, dual lighting from either side (30–45° offset) is preferable. Soft-light sources reduce spurious surface texture or irregularities (blisters, wrinkles).
3. Shadowless lighting (along the lens axis) is necessary for multi-layer graphics (Pepper's ghost).

In Figure 4.6 you will see typical methods of lighting fairly small flat surfaces. Larger areas present different problems, which we shall discuss when lighting *backgrounds*.

Three-point lighting

Let us just recap. As you move a lamp round a subject, shading and shadows form to the side. If you raise the lamp, they move downwards. So if you do both, modeling moves diagonally. For some reason, the *combined* effect is usually more pleasing than either 'raised frontal lighting' or 'angled level lighting'.

As a rule, the most attractive lighting effects derive from a approach called *three-point lighting*. The technique is not sacrosan it can be varied as needed. But it is certainly a good starting poi

■ *Key light* First we position the main light – usually a hard li source – at an angle of around e.g. 4–5H or 7–8H, and about 1– elevation. This *key light*:

- Establishes the light direction;
- Creates the principal shadows;
- Reveals form, surface formation, and texture;
- And largely determines the *exposure*.

■ *Fill light (filler)* Then carefully positioned diffused ligh added:

- To illuminate shadow areas.
- And reduce the overall tonal contrast.

■ *Back light* Finally a hard source is placed behind the subj facing towards the camera – but *not* shining into its lens and cau *lens flares*! This *back light* is usually around 11H to 1H at a ver angle of e.g. 10V to 11V.

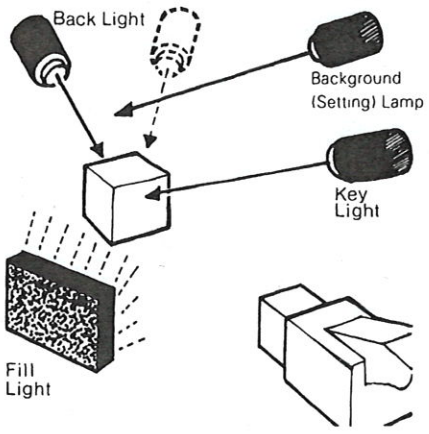

Fig. 4.7 Lighting an object
Effective lighting treatment usually involves four basic lighting functions:
Key light. Usually one lamp (spotlight) in a cross-frontal position.
Fill light. Usually a soft-light source illuminating shadows and reducing lighting contrast. But may not be required, or alternatively a reflected hard light is used (rarely a direct spotlight).
Back light. Usually a spotlight (or two) behind the subject, pointing towards the camera. (Occasionally soft light is used.)
Background (setting) light. Backgrounds are preferably lit by specific lighting, but they may be illuminated by the key or fill-light spill.

Back light creates a rim of light along the top and an edge o subject. Without it, the subject may merge into its background a appear flat. In addition, back light helps to reveal its edge cont and give it solidity. If the subject is translucent or has tracery light will show up the details.

Again, there is nothing mandatory about these arrangements. may want to use a single back light at 12H/9V, or very rarely, e on the ground at 12H, shooting upwards towards the rear o subject. Sometimes *two* backlights either side at e.g. 11H and will attractively *double-rim light* the subject.

The arrangement you decide on will depend on a number of factors, including:

- The nature of the subject;
- Its form and tones relative to its surroundings;
- The way it is facing;
- The camera viewpoint;
- The particular atmosphere or ambiance you are aiming at.

The key light

Let us look in more detail at our choice of key light. First, there should only be *one* key, and this will normally be a focused hard light source (a spotlight), casting a single shadow and well-defined modeling. If you use two or more frontal keys on the same area (e.g. crossed frontal key lights) they will create two sets of conflicting shadows and modeling. One lamp dilutes the shadows cast by the other, and this situation is best avoided.

Where shadows (or modeling) from the key light are too prominent, a diffuser (scrim) placed over it will soften the light to some extent, but will also reduce its intensity. Occasionally, one may use a soft light source, to reduce modeling and minimize shadows. But as this diffused light is likely to spread uncontrolled over the rest of the scene its value is limited. Arguably, as a rule of thumb, one might say that the closer the key light is to the subject, the softer it should be.

The *angle* of the key light will be influenced by the subject and what you want it to look like. You will get a better idea of how crucial this angle can be when we look at portraiture.

Many types of TV production, including talk shows, interviews, newscasts and games shows, use stylized settings and action is limited. Here you can usually position the key lights for the most effective results. In more complex situations the key light's position may have to be something of a compromise; in order, perhaps, to avoid a camera shadow, or to get round an obstructing piece of scenery.

There are often visible or *implied* light sources in realistic surroundings. Then, ideally, the direction and angle of the key light should relate to these sources. If someone is standing near a window in daylight, and you have keyed them from another direction, the effect will look false and unconvincing.

In practice, compatible light directions are most important in longer shots. For waist shots or closer you can often 'cheat' the key light position, placing it at an angle that achieves the most attractive effect; even if it is environmentally inaccurate. This is done regularly in film making, where close-ups are shot separately and are lit 'down the nose-line' for maximum effect.

When there are no obvious sources of illumination in a nat scene (i.e. the camera does not show a ceiling light, or window decorative lighting fittings) the problem of compatible li directions does not normally arise.

Fill light (filler)

The modeling and shadows cast by the key light usually appear harsh and strongly contrasted. So we need to add *diffused* light th will illuminate these areas and reduce the overall contrast, witho casting new visible shadows. This 'soft' light is termed *fill light; fil fill-in*. The illumination from some 'soft light' sources is insufficie ly diffused, and casts faint shadows. But these are not usual obvious on-camera.

The character of fill light

As you know, soft light has two main limitations:

- It is liable to spread over the nearby scene.
- Its intensity falls off quite quickly with distance.

These characteristics can be an embarrassment in

- *Low-key situations*. The soft light introduced to impro portraiture may over-illuminate dimly lit surroundings.
- *Distant action*. Sometimes it is not possible to place a softlig fixture reasonably close to a subject; e.g. as local fill for someon in a pool of light on a darkened theater stage. Then you may hav to use a diffused spotlight as a fill light; keeping its intensity low and hoping that the key-light is sufficiently strong to wash-out th additional shadow.
- *Strong sunshine*. When shooting in bright sunshine, you may hav little option but to use 'hard fill' from a high intensity arc to fi major shadow areas. Nothing else is sufficiently powerful.

It is best, however, to consider this 'hard fill' technique as a first-aid measure rather than a regular practice.

The intensity of fill light

How bright should the fill light be? There is an oft-quoted rule-of-thumb of '*one-half to one-third as bright as the key light*'. But we often need no fill light at all! There is no hard and fast rule. The intensity of the fill light has a considerable effect on the picture impact. It should *never* exceed the intensity of the key light, and most would agree that it should rarely equal it. The purpose of the fill light is to augment.

How much is needed will vary with the amount of tonal contrast you want in the picture. A highly dramatic situation may require no

fill light at all. A high-key comedy scene can need a considerable amount.

If you use an excessive amount of fill light, shadows and shading will be weak, modeling slight, and the overall effect flat, even lifeless. Dynamic lighting requires a careful balance between the relative intensities of the key and fill.

If you can switch off the *key light* and can still see fully illuminated shots, then there is too much fill light!

- The fill light should not be strong enough to modify the *exposure*.
- It should not suppress the modeling created by the key light.
- Fill light should not create its own spurious shadows, or modeling.
- It should not be so powerful that it establishes a different light direction from the key light.

The level of fill light is normally adjusted to suit portraiture. If it doesn't happen to reveal sufficient detail in the background, light those areas separately or arrange extra lighting there, rather than increase the fill light's intensity.

It is worth stressing these points, for strong fill light is too often used to iron out mistakes; to disguise the ugly modeling that comes from badly placed key lights – e.g. to illuminate the deep eye shadows produced by oversteep keys. Admittedly, there are occasions when this is the only way to cope with unplanned action or impromptu shots, but it should only be used as a first-aid measure.

Fill light ratio

Figures quoting 'ideal' proportions of fill light intensity to key-light intensity can be misleading, for choice is affected by so many factors. Two conventions are used when describing the relative intensities of key and fill light:

- The 'key-to-fill' ratio (their separate intensities), or
- The 'key-*plus*-fill ratio'

Provided we realize which convention is being used, either approach is useful.

Factors affecting fill light intensity

As you will see, it depends on a number of factors, including:

- *Significance*
- *Subject*
- *Time of day*
- *Interiors*
- *Mood*
- *Dramatic effect*

■ *Significance* Why are you introducing fill light?

- Is it to avoid the lop-sided effect of an unfilled offset key?
- Is it to control the density of shading, and build up three-dimensional effect?
- Is it to make all information in the shaded area clearly visible (i drawn detail, lettering, texture)?

The answer here influences the strength of the fill light.

Suppose the subject is a decorative vase. An offset key light reve its form, and a back light rims its outline. Without fill light, the de shadow cast on one side of the vase is likely to make it lo unbalanced. All surface detail and texture there will be hidden.

By adding a low-intensity fill light you can show the overall for and the vase begins to look more three-dimensional. Surface detai hardly discernible in the shaded area.

Increase the fill light a little more, and we can now see decorati in the '*luminous shadows*'. Make the fill light brighter still, and t vase loses some of its roundness, but now all details of the decorat are clearly visible.

In this example the intensity of the fill light is determined b whether you want a dramatic image, a solid-looking effect, or display in which all of the vase's surface is sharply defined.

■ *Subject* Where subjects are well textured and strongly contoure they are shown at their best if we light to create strong vi modeling. On the other hand, where the subject has a smooth shaped surface and/or a delicate texture, this treatment would lo harsh and crude. Instead, medium- to high-intensity fill light wou be more appropriate to prevent texture becoming exaggerated.

■ *Time of day* The amount of fill light you need can vary with t *time of day* action is taking place. When shooting at sunrise or du the prevailing atmosphere will be ruined if you use too much fi Shooting in strong sunlight, though, you will often need intense fi light to prevent shadows becoming dense.

■ *Interiors* Strong fill light conveys an impression of 'openne and space. If you use an excess of fill light when lighting an interi scene (location or studio setting) it will destroy any feeling o enclosure. Where action is taking place near a window, more intens fill light is a natural effect. But when the action is well within a roo (particularly if the windows are small), contrast would usually b greater, so less fill light is needed. Shadowy interiors require ver little fill light.

■ *Mood* The intensity of fill light can vary with the *mood* of scene. One might light happy light-hearted action to a low contrast while using much less fill light for a sad or violent scene.

■ *Dramatic effect* There are times when you will deliberately leav shadow areas *un*filled, for dramatic effect.

It is night. The camera moves closer and closer towards a wayside notice. Moonlight casts strong shadows of an overhanging branch onto it, hiding its message. A gust of wind blows the leaves aside, and we discover the warning that it is an unfenced cliff-edge!

A silhouetted intruder sits in a darkened room, a large-brimmed hat casting a shadow over his face. He strikes a match, and by its light we recognize who he is.

Familiar enough visual clichés perhaps, but in these situations strong fill light would have ruined the dramatic moment.

Fill light positions

There are various opinions on the 'ideal' position for the fill light. Let us look at these in some detail (Figure 4.8). We can summarize the main locations as *frontal fill*, *offset fill* and *wide-angle fill*.

- *Frontal fill.* Filling from around the camera position is probably the most obvious method; a soft light on or above the camera. One could argue that from this position we can fill any shadow areas seen by the camera, and there is little point in doing anything else. However, a frontal fill light does have disadvantages for certain key light positions, when it further illuminates the area already lit by the key light and reduces the modeling.
- *Offset fill.* An offset fill light is less likely to nullify the effect of the key light or add to exposure. It will not reduce subtle half-tones or flatten modeling produced by the key.
- *Wide-angle fill.* If you place the fill light at a greater angle to the key it lights only the shadowed area. However, there is a chance that it may produce secondary modeling there.

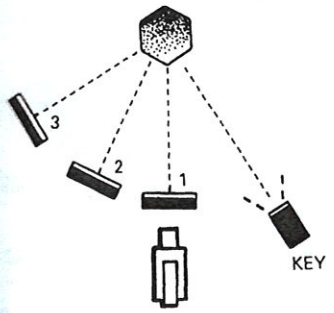

Fig. 4.8 Fill-light positions
The effect of the fill light will vary with its position relative to the key light:
1. Frontal fill.
2. Offset fill.
3. Wide-angle fill.

Diffuse lighting

The sharp modeling that a hard key light provides is far too harsh for some kinds of subjects; particularly when you want to convey softness, delicacy, subtle contours; e.g. when lighting babies, children, elderly faces. You can approach this situation in three ways:

- Simply increase the intensity of a frontal soft fill light, so that shadows are extremely 'transparent', leaving modeling visible but slight.
- Heavily diffuse the hard key, so that it is less strident, and produces 'softened off' modeling.
- Use fairly strong soft light to illuminate the subject, while back light or side light strongly defines its contours.

The last technique is capable of most beautiful results, with subtle shading and delicate half-tones. We see the effect in nature when

shooting towards the sun, and sky light alone illuminates the face (*contre-jour* lighting). Badly used, however, this technique can produce quite uninteresting, flatly lit pictures.

It usually relies for its success on

- Angled soft light – e.g. from 4H or 8H;
- Little or no fill light from other directions;
- Carefully located lighting from behind the subject;
- A sensitive balance of intensities; avoiding either excessive back light or over-strong frontal illumination.

Back light

There seems to be quite a lot of confusion about the need for back light.

- The amateur tends not to use it at all, except accidentally.
- Certain 'pictorialists' seem to use it abundantly, as an 'essential' atmospheric effect.
- Some 'realists' regard back light as false and unnatural (presumably overlooking *contre-jour* shots into the sun).
- Many add back light by rote, as a routine for all lighting treatment.

In reality, back light is a persuasive tool that, when appropriate, makes a valuable contribution to pictorial lighting.

Hair and clothing are frequently of similar tone to the background, and will appear to merge with it if there is no back light. Color differences alone are not sufficient to isolate the subject and make it stand out. Tonal separation is a particular problem with dark hair and clothing.

Even when tonal values are quite distinct, and there is a marked contrast between the subject and background (e.g. a dark suit against a light background), back light will usually enhance the picture. Particularly with dark clothing, back light catches its folds and edge contours, and gives it shape and solidity; preventing its being reproduced as a silhouette.

Without back light, translucent subjects would lose their entire visual impact. They would appear opaque. Where a subject has openwork (tracery, lattice, mesh) back light helps to model details, and prevent it being lost against the background.

In most cases back light is only *distracting* when it is too bright, or when it is totally inappropriate. The strong *double-rim* back lighting that creates a glamorous aura around a beautiful girl can look incongruous when used to light a weatherbeaten tough.

You will not always need back light; especially where the subject is keyed from the side (e.g. for a profile shot). When back light is steep, or widely offset (e.g. at 10H or 2H), results can be worse than having none at all. If a person is lit with badly angled back light the effect can appear artificial, phoney, or just downright ugly.