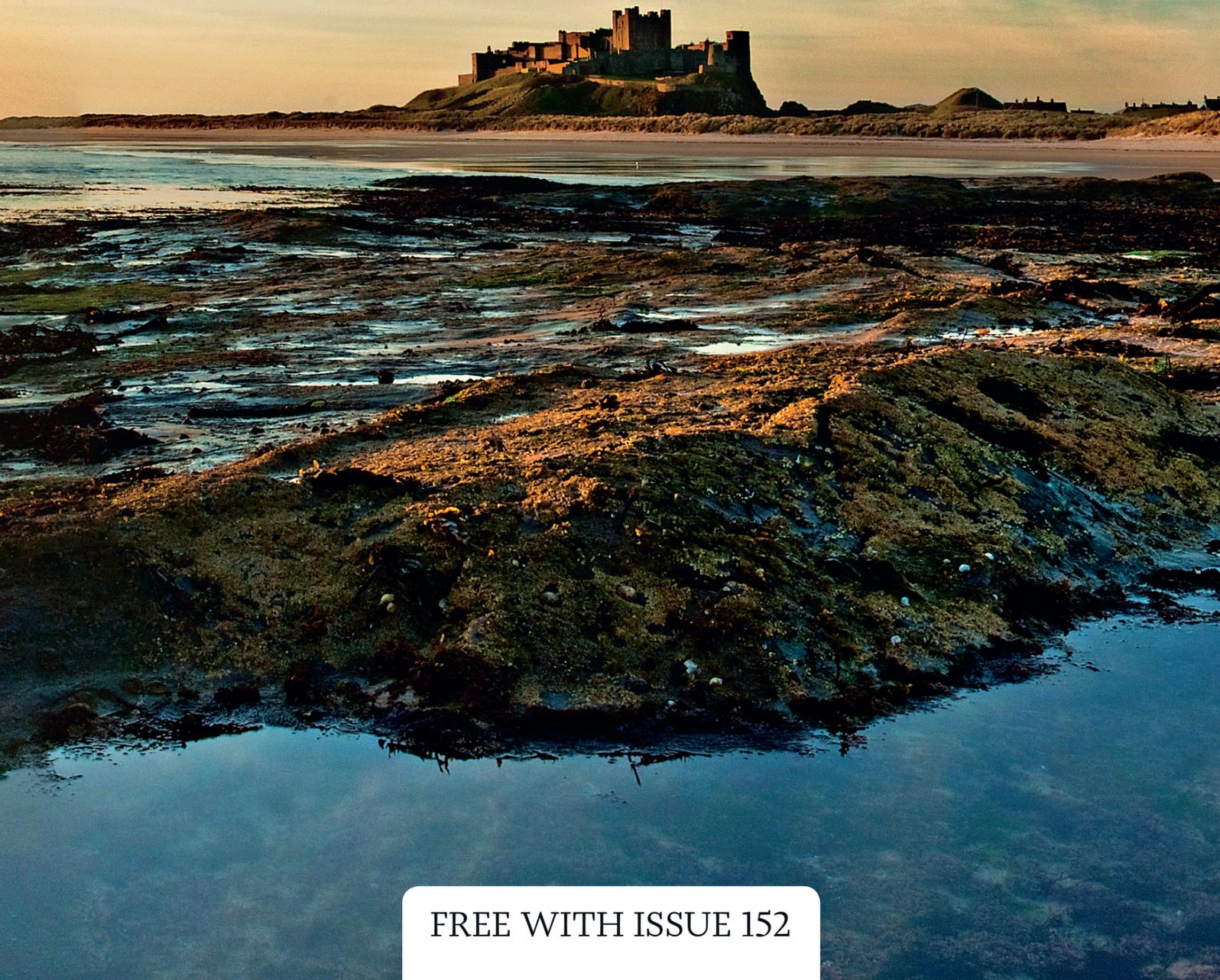


Digital
Camera
PRESENTS

A PHOTOGRAPHER'S
GUIDE TO
**Sharper
Shots**

Never take a blurred image again with this essential guide to capturing crystal-clear photos



FREE WITH ISSUE 152

Shutter speed and support

Use these simple techniques and tips to beat the shakes



Shutter speed and focal length

To capture sharp shots handheld, your camera shutter speed needs to be fast enough, and the focal length of your lens plays a big part in determining how fast it should be. The effects of camera shake are magnified at the telephoto end, so you'll need faster shutter speeds at longer focal lengths.

A good rule of thumb is to shoot at 'one over' the effective focal length (EFL) of your lens; so, for example, an EFL of 300mm requires a speed of at least 1/300 sec. If you shoot with an APS-C sensor camera, you'll need to take into account the crop factor, which is 1.5 for Nikon cameras and 1.6 for Canon. Multiply the crop factor by the lens's focal length to calculate the EFL. So if you're shooting at 300mm on a Canon APS-C body, for example, $300 \times 1.6 = 480$, so a 1/500-sec shutter speed should give shake-free shots.

Up the ISO

If you're shooting handheld in low light, or capturing action shots of fast-moving subjects, you may find that you can't select a fast enough shutter speed to get sharp shots, even at wide aperture settings. The easiest solution is to increase the ISO. While newer SLRs offer excellent low-light performance, you may have to compromise a little on image quality. If you increase your ISO from 100 to 1,600 you'll gain an extra four stops: if you lock your aperture, that will increase your shutter speed from, for example, 1/15 to 1/250 sec.

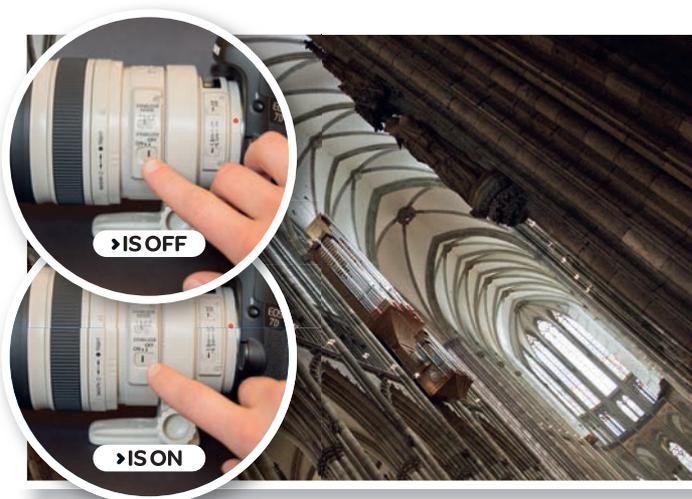


Image stabilisation

An increasing number of lenses feature some form of image stabilisation system, which enables you to shoot handheld at up to three or four stops slower than would be possible with a non-stabilised lens. Canon calls this feature IS (Image Stabilisation), while Sigma labels it OS (Optical Stabilizer) and Tamron calls its system VC (Vibration Compensation). Stabilisation is a great feature to have when you're shooting in low light or when you want to freeze action, as you can drop your shutter speed from, for example, 1/15 sec to 1/250 sec. Some lenses include a stabilisation system with two settings, to compensate for both vertical and horizontal movement.

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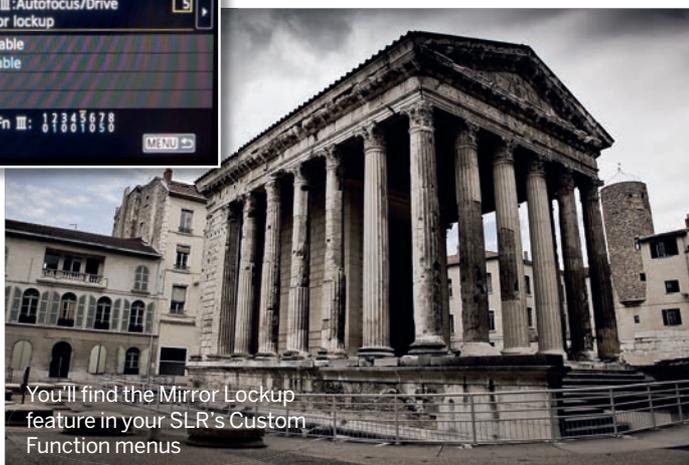
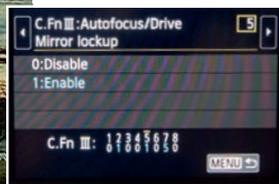


Get creative with shutter speed

Rules are made to be broken. You can get creative by using slow shutter speeds to blur some or all of an image. When you're shooting cyclists, motorsports or other fast-moving subjects, you can pan the camera to follow a subject, and keep it sharp while blurring the background to create the impression of movement. You can also create painterly effects with a technique called camera-dragging. Set your shutter speed to 1/30 sec to start with, then move the camera during the exposure to turn subjects such as trees into abstract streaks of colour.



Practise your panning technique, and you'll soon be able to freeze fast-moving objects while blurring the background



You'll find the Mirror Lockup feature in your SLR's Custom Function menus

Mirror lockup

As well as the camera-shake that can be introduced if you handhold the camera at slow shutter speeds, shots taken with SLR cameras can also be blurred by slight internal vibrations as the mirror flips up and down. If you use long telephoto lenses, or shoot extreme close-ups or long exposures, the tiniest of movements will be magnified – and even if you use a tripod, you can't eliminate vibrations completely.

The solution is to enable mirror lockup, where the mirror flips up when you press the shutter button; you press the button again to take the shot, after which the mirror flaps down. If you don't have this feature, use Live View; the mirror is locked up while this is enabled.

Tripod setup

When you're shooting landscapes in low light, and using narrow apertures to maximise depth of field, your shutter speeds are likely to be too slow to shoot handheld. A tripod will help you get sharper shots, but simply mounting your camera on one may not eliminate all movement; you need to make sure the tripod is as stable as it can be. Extend the top leg sections first, as these are sturdier, avoid raising the centre column if you can. Don't touch the camera or tripod during the exposure: use a remote release or the self-timer to fire the shutter, and enable Mirror Lockup or use Live View. On windy days, hang your kit bag from the centre column (there's a hook for this on some models) to weigh down the tripod.



Master depth of field

Aperture, focal length and your lens all affect what's in focus in shots



It's not just aperture that affects depth of field: a longer focal length means that the depth of field is shallower



Depth of field and focal length

Depth of field is also affected by focal length. If you shoot with a wide-angle lens, you'll capture a broader depth of field, which keeps the scene sharp from front to back. For example, at f/5.6 on a wide-angle 24mm lens, you'll get a broader depth

of field than at f/5.6 on a 100mm telephoto lens. This is why wide-angle lenses are great for landscapes, while the shallower depth of field of telephotos enables you to isolate a subject you've zoomed in on, making them ideal for wildlife.

Zoom vs prime

The quality of your lens can also have a big impact on the sharpness of your shots. Prime (fixed-focal-length) lenses are optically superb, but they're relatively expensive and can be limiting in terms of flexibility; zoom lenses generally offer greater versatility at lower prices, but at the cost of some image quality.

It's best to avoid the extreme focal lengths of a zoom lens, as optical performance tends to be poorer at the wide and long ends. Another factor to consider is the maximum aperture available at different focal lengths. For example, a 70-300mm f/4-5.6 lens runs from f/4 at the 70mm setting through to f/5.6 at the 300mm setting. As the aperture decreases, the shutter speed needs to be slower to maintain the same exposure, which increases the risk of camera-shake.

Prime lenses often have very wide maximum apertures, so as well as being 'fast' lenses – which enable you to use faster shutter speeds in low light – they also have fewer lens elements, making them lighter and optically more precise. The drawback is that you may need to carry more lenses to cater for a range of shooting situations.



Aperture and depth of field

In simple terms, the smaller the aperture is, the greater the depth of field is. So if you're shooting a landscape and want to maximise the depth of field to ensure the whole of the scene is sharp, for example, you'd select a narrow aperture, ideally between f/16 and f/22. To compensate for the smaller aperture, which won't allow as much light to reach the sensor, you'll need a longer shutter speed to capture a good exposure, so in low light you'll need a tripod to support your camera.

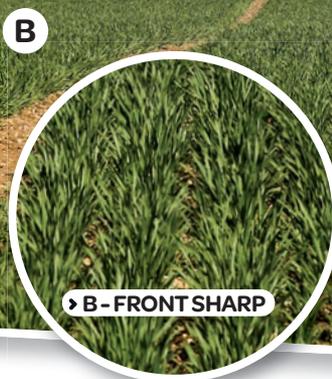
If you want the background to be out of focus – to make a portrait subject stand out, for example – you'd select a wide aperture, such as f/2.8 or f/4. As well as portraiture, this aperture range is ideal for wildlife photography, or any situation where you want to lift your subject out of their background. The larger aperture opening allows more light to reach the sensor, so you won't have to compromise on shutter speeds, enabling you to shoot handheld even in low light conditions.



Depth of field and where to focus

Depth of field decreases the closer you are to a subject, so accurate focusing is vital to ensure that your subjects are sharp. This is why you need to use narrow apertures in macro photography. Even then, if you're shooting extreme close-ups the depth of field may only be a matter of millimetres.

As a rule of thumb, there's roughly double the amount of depth of field behind a focal point than there is in front of it. So, for example, if you were to shoot a landscape with a narrow aperture and focus at infinity (A) you'd lose a lot of depth of field; by focusing about a third of the way into the scene (B) you'll get optimum sharpness throughout the frame.



Find the sweet spot

The 'sweet spot' of a lens refers to the aperture that will deliver the maximum sharpness across the frame. A lens doesn't produce the same level of sharpness throughout its aperture range, so by determining its sweet spot you

can ensure you capture the sharpest shots possible. The sweet spot is usually in the mid-range aperture settings of f/8 to f/11, with sharpness tending to drop off at the minimum and maximum apertures. So your choice of aperture not only affects depth of field; it plays a part in ensuring sharp shots. It's best to use the sweet spot for landscapes, and other situations when you want corner-to-corner sharpness.

Use the optimum aperture for your lens when capturing every detail counts



Perfect your focussing

Choose the right AF mode for static, moving or unpredictable subjects

AF modes

SLR cameras have a variety of autofocus modes, which you can switch between by pressing the AF button usually found on the top of the camera and rotating the control dial; you can also access the AF modes via the Quick menu on the rear LCD screen.

One Shot mode is ideal for static subjects, such as landscapes or still-lives. For sports, wildlife and other action, switch to AI Servo to track moving subjects. For subjects that are static but might move unexpectedly, such as wildlife and children, use AI Focus, which is a hybrid of the other two modes: it initially locks on to a subject in One Shot mode, but will switch to AI Servo if the subject moves.



AF points

Beginners tend to rely on their camera's Auto AF point selection mode. This default mode uses a grid of autofocus points in the viewfinder to focus on whatever's closest in the frame – and this means your camera may not always focus on exactly what you want it to. It's better to manually select your AF points, so you have control over which part of the scene or subject is in focus.

Some high-end cameras, such as Canon's EOS 7D, include a hybrid Zone AF mode, which enables you to select a cluster of AF points. This is useful for photographing moving subjects, as the higher number of AF points will increase your chances of focusing accurately on the action. The more cross-type AF points (which detect contrast in two dimensions rather than just one) that a camera has, the more accurate that autofocus is likely to be.



The AF system in Canon's 7D (right) has 19 cross-type AF points, while the 60D (left) has just nine



Focus with Live View

Your SLR's Live View mode makes it quick and easy to check that your focussing is spot-on before you take a shot. Live View works best when your camera is mounted on a tripod. Switch off image stabilisation if your lens has it, and switch the lens to MF (manual focus).

Press the Live View button, then zoom in. Using the cursor keys or multi-controller, navigate to the part of the scene where you want optimum sharpness, and adjust the lens focus ring until the area you're interested in looks perfectly sharp. Once you've taken the shot, you can switch to playback mode and zoom in to double-check that the image is sharp. Tweak the focus and re-shoot if necessary.

Manual focus

There's no right or wrong time to use manual focus, but there are times when it will make your life easier. For example, macro photography requires precise focussing due to the limited depth of field created by shooting at such close proximity to subjects.

By setting your camera up on a tripod and switching to manual focus, you'll have complete control over which parts of the shot are in sharp focus. If you shoot handheld using autofocus, the chances are your focussing won't be accurate, and camera-shake may also be an issue. Low-light conditions can also make it hard for lenses to focus quickly and accurately in AF mode; if so, the lens will hunt for focus, causing a delay that may mean that you miss the shot.



Sharpening software

How to correct minor blurring, and enhance images ready for output

In-camera sharpening

When you shoot at the JPEG quality setting, your camera will apply a filter to your images, which sharpens them and boosts the colours and contrast. This is why the raw file can look slightly soft and washed-out when you compare a JPEG and a raw version of the same shot on the camera display.

You can change the amount of sharpening applied to JPEGs in-camera by creating a user-defined Picture Style, and adjusting the sharpness setting. If you shoot in raw, a default sharpening effect is applied when you bring the image into raw-compatible image-editing software, like Lightroom or Adobe Camera Raw. You can fine-tune the effect if need be; you'll often want to apply further sharpening to an image before outputting it.

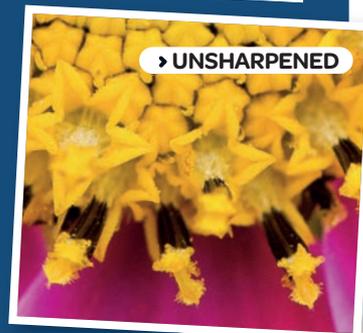


When to sharpen

Sharpening your images is one of the most important steps in post-processing. While 'capture' sharpening is applied to JPEGs in-camera, and to raw images in image-editing, you're still likely to have to apply 'output' sharpening to images. If you're printing images, you'll need to sharpen them to counter the softening effect of inkjet printing.

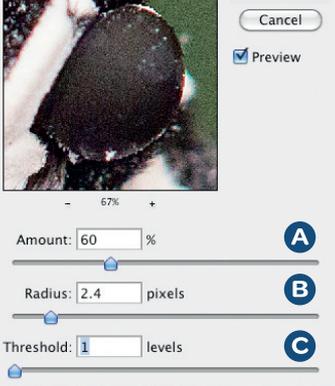
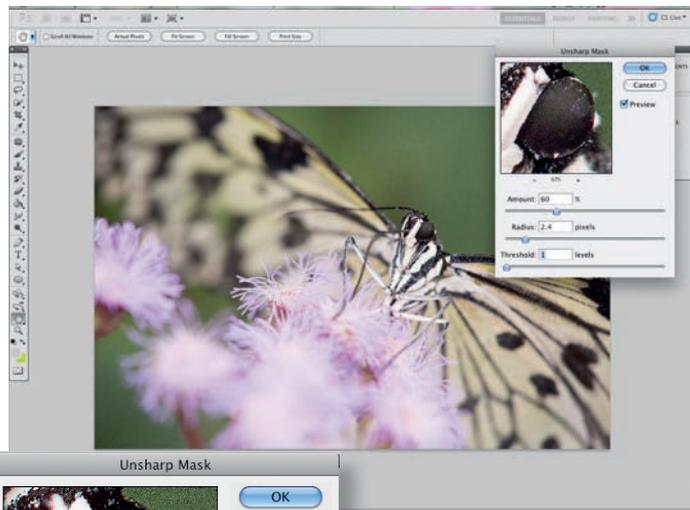
You can also sharpen images to correct any slight blurring caused by camera-shake or subject movement, but you won't be able to rescue badly blurred shots.

Finally, you may want to apply selective sharpening to just part of an image – sharpening the eyes in a portrait shot so they stand out, for example. But beware of oversharpening!



Unsharp Mask in Photoshop or Elements

Photoshop's Unsharp Mask filter is a simple-to-use and highly effective sharpening tool, which enables you to control the sharpening effect applied to your images using three sliders, and preview the results. To access the Unsharp Mask in Photoshop CS, go to Filter > Sharpen > Unsharp Mask; in Photoshop Elements, go to Enhance > Unsharp Mask.



C Threshold
This determines how strong the contrast needs to be between pixels for an area to count as an edge to which sharpening is applied. At a level of 0, edges throughout the image are sharpened. At higher values (25 levels and over), only high-contrast edges are sharpened. This enables you to prevent sharpening being applied to areas of smooth tones, such as skin and skies, where it can exacerbate noise.

Settings

The settings you use for a particular image will depend on its content. A typical landscape with 'high-frequency' detail (lots of fine edges in close proximity) will need a higher Amount setting and a lower Radius value; while a typical portrait with 'low-frequency' detail (more prominent edges, widely spaced) will need a lower Amount and a higher Radius. A good starting point for most shots is Amount: 100%; Radius: 1; Threshold: 5.

A Amount
This determines the strength of the sharpening applied. Whether you use a low or high value will depend on the settings for the other sliders.

B Radius
Sharpening works by boosting the contrast between pixels along edges in an image. The higher the Radius value entered here is, the greater the edge width in pixels across which sharpening is applied. At low Radius settings, only fine detail will be sharpened; at higher settings, thicker edges will be sharpened too.

Raw sharpening

You can apply sharpening to your images at the raw processing stage in several programs: we're using Adobe Camera Raw and Canon DPP as examples here. This will typically be capture sharpening, although you can apply output sharpening too if you don't plan on making major edits to an image in other programs.

Adobe Camera Raw

On the Basic tab, you can use the Clarity slider to increase local contrast; the adjustment is somewhere between a global contrast adjustment and a sharpness boost, but it creates the impression of greater sharpness.

On the Detail tab, there are four Sharpening sliders: Amount, Radius, Detail and Masking. Amount controls the strength of the sharpening, and Radius controls the width of the edges across which sharpening is applied. Detail enables you to restore sharpness to areas that have been blurred by the sharpening.

The Masking slider controls the edge mask. At a setting of 0, everything in the image receives the same amount of sharpening; at 100, sharpening is limited to well-defined edges, so you won't sharpen noise in areas of smooth tones such as skies. You can hold down Alt while dragging any of the sliders to see a monochrome preview, showing where the effect of that slider is being applied.



Digital Photo Professional

There are two sharpening modes to choose from when you look in DPP's Raw tab: a single Sharpness slider, which applies a basic but effective overall sharpening effect; and the more advanced Unsharp Mask option, which has three sliders. Strength, Fineness and Threshold work in broadly the same way as the sliders in the Unsharp Mask filter found in Photoshop or Elements, with Strength doing the same job as the Amount slider and Fineness working in the same way as the Radius slider.



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