

An introduction to:

Photoshop for Photography

Objective:

Digital image editing as a means to an end, not an end in itself.

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Article Outline

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Using Photoshop → **from page 9**



Preamble

Initial
considerations

Three key
techniques

Computer
resources

Why Photoshop (or Elements)?

Any serious improvement of your images with digital manipulation implies the use of Adobe **Photoshop**¹ or Photoshop **Elements**. The latter, first released in 2001, is a scaled-down and much cheaper version – about 1/6th the price – of Photoshop. Elements is often ‘packaged’ when purchasing equipment such as scanners and, therefore, it is widely available. Elements is adequate for many photographic purposes but it does have some limitations which we will discuss later.

Other software packages such as Apple **Aperture** and Adobe **Lightroom** are mainly workflow managers but they do offer some image-enhancing capabilities. Aside from a limited range of editing options, their main drawback is the lack of ‘Layers’ which is such an integral (and very desirable) feature of Photoshop and Elements.

Photoshop (and to a lesser extent **Elements**) is such an extensive software package that it can be daunting and, at first, off-putting for many people. However —

you need use only a very few selected tools and techniques within Photoshop or Elements (to wit, only *three* tools and *three* techniques) to improve your *photographic* images markedly.

1 First released in 1990 for Mac only! A Windows version came along in 1992.

On using image editing software:

Two commonly-posed questions

- 1) Is the use of digital image manipulation somehow fraudulent and not in the spirit of true photography?
- 2) Ideally, should what the camera records be taken as final and seen as being in accord with classical photography?

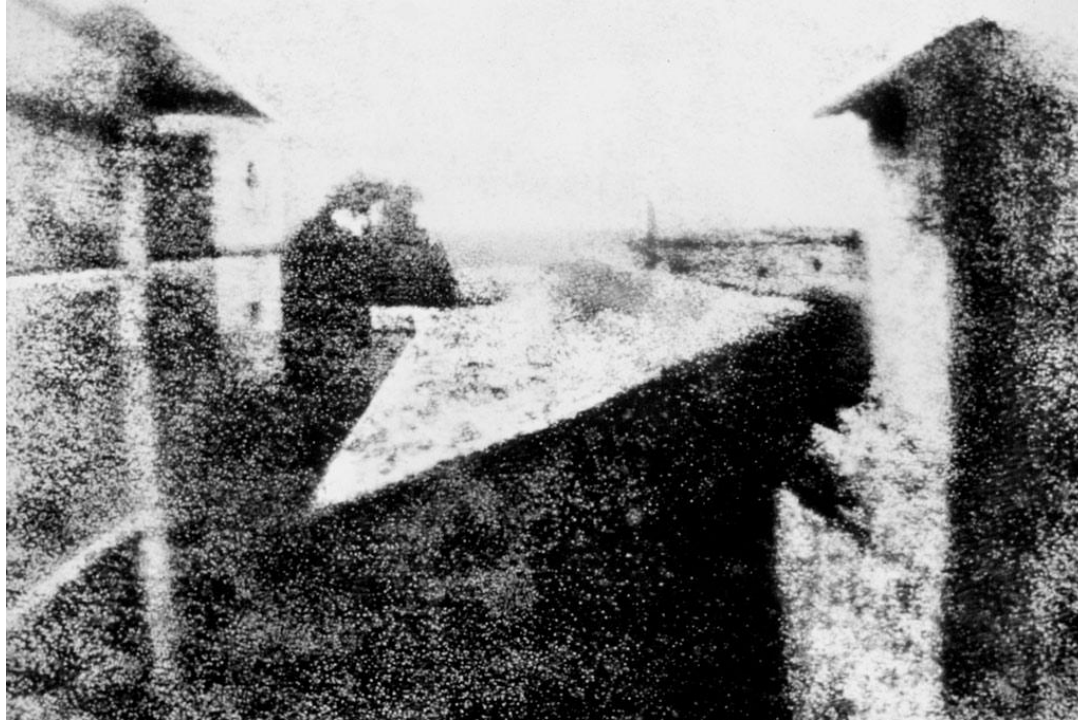
We shall see!

Let's start from the beginning ...

1826. The first photographic print:

“View from the Window at Le Gras”

Joseph Niépce



This photographic image marks the beginning of photography. From here the technology of capturing and printing images developed. Of particular interest for us was the early use of multiple images – only 31 years after Niépce’s initial pioneering effort – particularly in the work of Oscar Rejlander ...

1857. Oscar Rejlander

“The Two Ways of Life”



Nude Study for the Two Ways of Life

The “Two ways of Life” is an allegorical subject of a father leading two sons to choose between ‘Religion & Industry’ or ‘Idlers & Bacchantes’.

This picture used 32 negatives and it took six weeks to make!

1914-1918. Frank Hurley World War I photos:

A selection of prints using multiple negatives



1942. Ansel Adams Fine Art Print:
“Clearing Winter Storm”

Print of what the camera saw
taken with an 8 " x 10 " view camera



Final print

after (a considerable amount of)
dodging & burning by Adams.



Adams:

*“The negative is the score,
the print is the performance”*

Some comments on image manipulation

- 1) Post-camera enhancement of images has been with us from the very beginnings of photography.
- 2) Image manipulation has become much easier to achieve with Photoshop or Photoshop Elements.
- 3) Too many images would appear to be overly 'photo-shopped' with the result that they emerge more like graphic art or are simply bizarre.

Two examples:

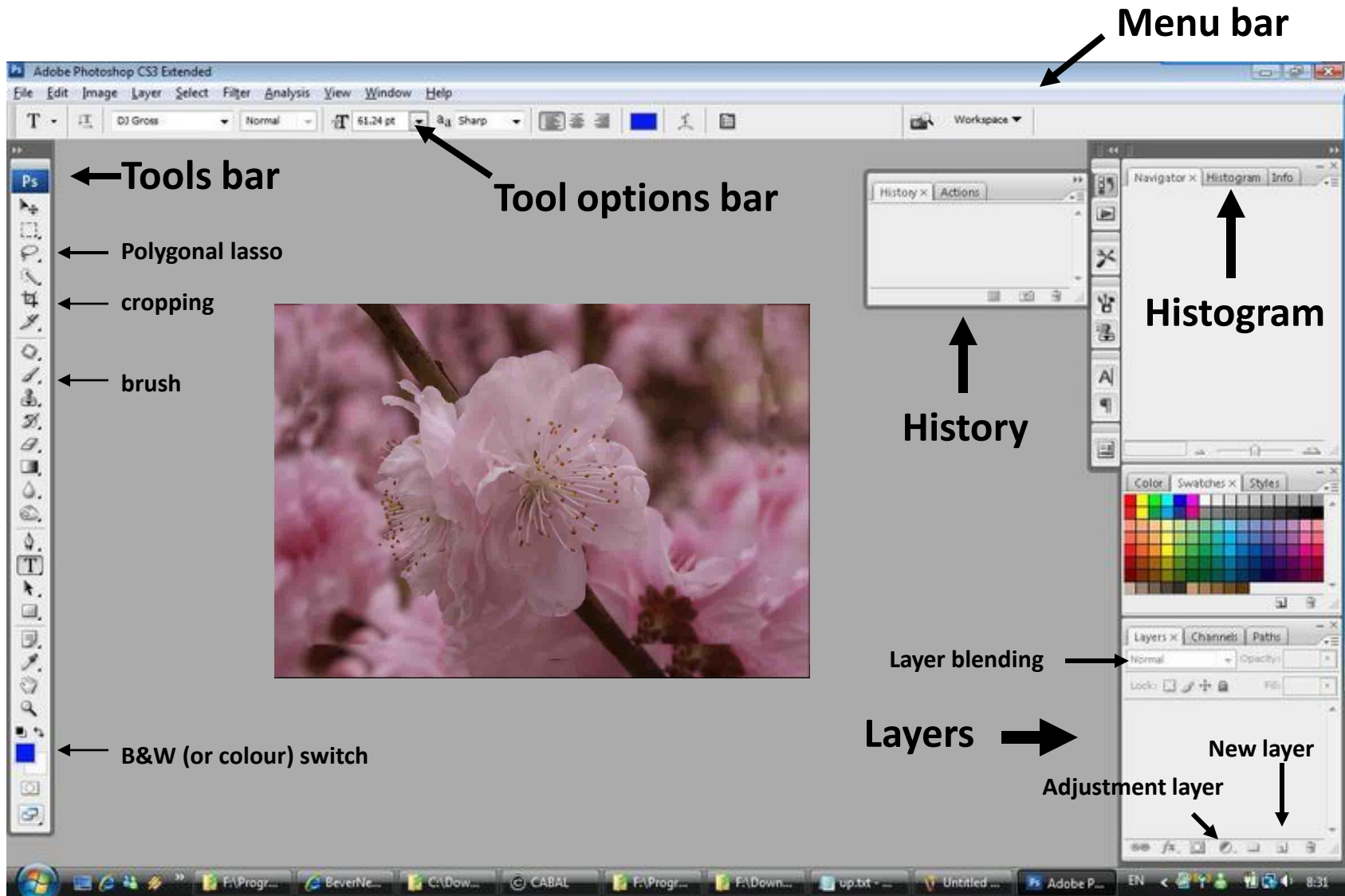


Graphic art in advertising



'Over-worked' photographic landscape

Using Photoshop



A typical Photoshop layout (Elements is similar)

I. From the camera

While the image from your camera will be in either JPEG or RAW format, always use TIFF format for editing; specifically:

If **JPEG** save a copy for editing as a **TIFF file (8-bit)**

[On opening in Photoshop, go to menu bar: > *File* > *Save As ...* .
Under 'Format' choose 'TIFF' then 'Save' and 'OK' 'TIFF Options'.]

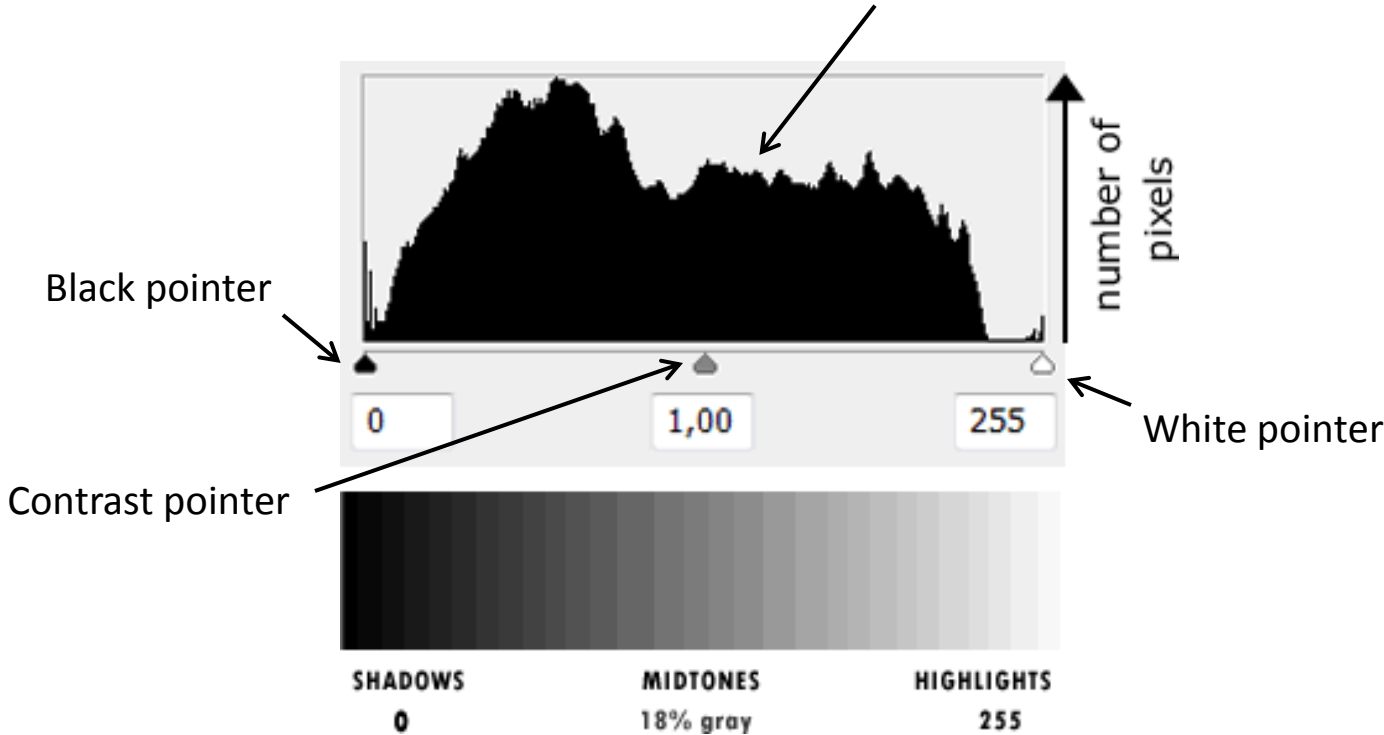
If **RAW** save a copy as a **TIFF 16-bit file** if using Photoshop or as a **TIFF 8-bit file** when using Elements (*see later comments*).

Note on RAW:

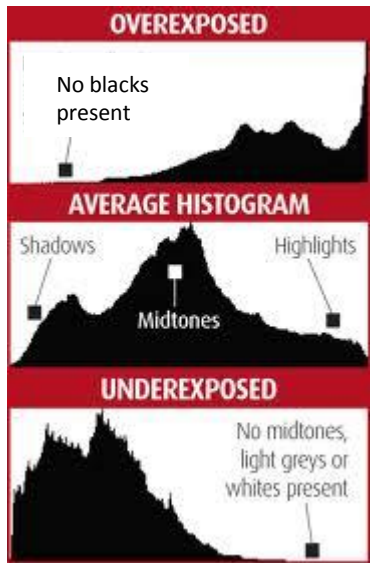
*RAW-derived TIFF files will need some degree of **sharpening** (unlike JPEG files which have already undergone sharpening and other enhancements by the camera's computer programs).*

II. The Histogram

Histogram shape of little consequence provided it extends fully from black to white



Note: 256 graduated levels from black to white



III. Bit Depth – what is it?

Bit depth number

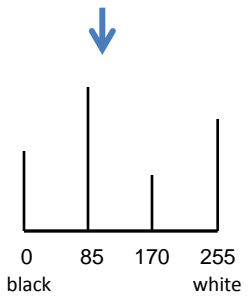
- 2^1 1-bit: 2 possible values, either 1 (on) or 0 (off)
- 2^2 2-bit: 4 possible values
- 2^4 4-bit: 16 possible values
- 2^8 **8-bit: 256 possible values**
- 2^{12} 12-bit: 4096 possible values
- 2^{16} 16-bit: 65,536 possible values

Example:

2-bit values

1 st bit	2 nd bit
0	0
0	1
1	0
1	1

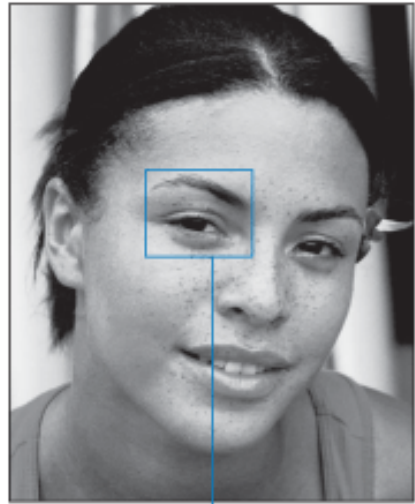
Histogram



Smooth tonal range

1 byte = 8-bits

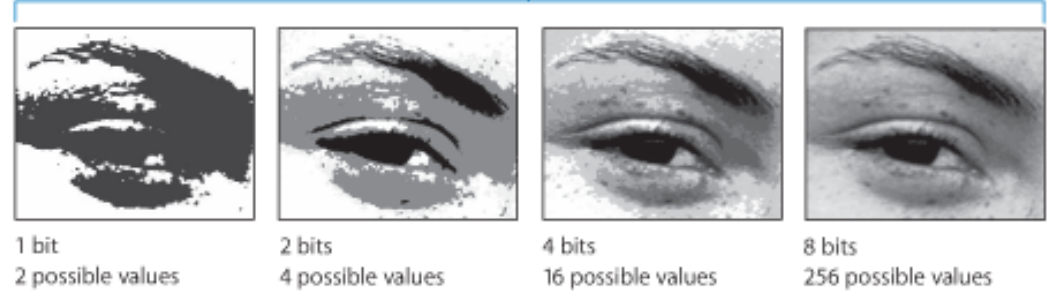
Beyond 8-bit, the eye cannot detect any further improvement in image quality



Note: in colour we require three separate channels, thus:

8-bit B&W; 3x8-bit = 24-bit colour

16-bit B&W; 3x16-bit = 48-bit colour



← Banding (abrupt changes in tone) →

IV. Why consider larger than 8-bit files?

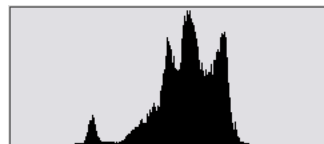
When printing or projecting: a digital image requires only a 256-level 8-bit file;

- any finer gradation in level step size with larger-bit files is superfluous.

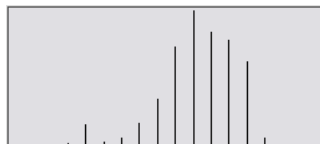
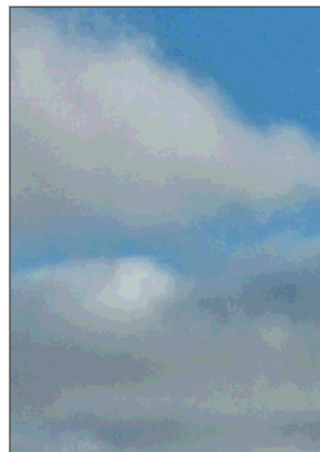
Why then consider working with larger than 8-bit files?

When editing digital images: In many digital editing procedures data is lost. This is especially true when using any transformational techniques. This means our original 8-bit file with 256 levels, will, when edited, contain some – possibly many – levels where there is no data.

Result: loss of tonal range to be expected and eventually banding or blocking may occur.



Before editing
(8-bit image)



An example after editing where
'banding' has occurred reducing
it, in effect, to a 4-bit image.

← Examples →



8-bit file before editing



8-bit file after editing

If you are working with a JPEG or any other 8-bit file you have no choice but to learn to live with it.

The solution is to work with 16-bit files

V. RAW to the Rescue!

Why?

1. RAW output from the camera is at least a 12-bit file (and some cameras have 14-bit output) where 4,096 levels of data are available.
2. Choosing RAW output from the camera you can save it as a TIFF 16-bit file which will retain all these 4,096 levels rather than have the camera throw most of them away (3,840 levels in fact) when creating a 256-level JPEG.

Advantage: we have a 16X increase in the number of levels available for editing. With the editing level step size being 16X that required for printing or projection, it provides enough excess capacity to ensure that whatever editing is undertaken, all 256 levels required for printing or projection will contain data. In other words, with the 4,096 levels made possible from the RAW data, between each level of the 256 steps required for printing or projection, we have 16 finer levels available **to ensure a full tonal range** is maintained after editing.

With 16-bit TIFF files you can edit with impunity!

*- But only from Photoshop CS2; **not** in Elements.*

VI. General Comments

- 1) Be aware there are many ways in Photoshop (or Elements) to achieve the same end.
- 2) You will use (at least initially) only a fraction of Photoshop's (or Elements') capability.
- Don't be tempted to try everything available, but on the contrary, ignore anything you don't need to use.
- 3) Aim to improve your images as **photographs** and avoid gimmicks.
- If someone on seeing your work says it has been obviously 'photo-shopped' then, in my view, you have failed!
- Always observe the 11th commandment: "Thou shalt not get caught"!
- 4) The following three techniques are well-proven means of improving your image markedly and will cover 80-90% of your photographic needs:
 - I. **adjustment of contrast and colour**
 - II. **dodging and burning**
 - III. **working on selections of the image**

In what follows each topic is covered *in concise a manner as possible* showing how best Photoshop (or Elements) can handle these techniques.

- 5) For RAW users an effective sharpening technique will be demonstrated.
- 6) **Monochrome:** while the methods and techniques to be described here will cover all types of digital images, the creation (conversion from colour) and editing of monochrome or B&W images is a subject deserving a separate talk to give full justice to the capability of Photoshop in this area.

On Cropping: Cropping an image is a critical and initial part of the creative process, either in the camera or in Photoshop. The cropping tool in Photoshop is easy to use and requires little demonstration.

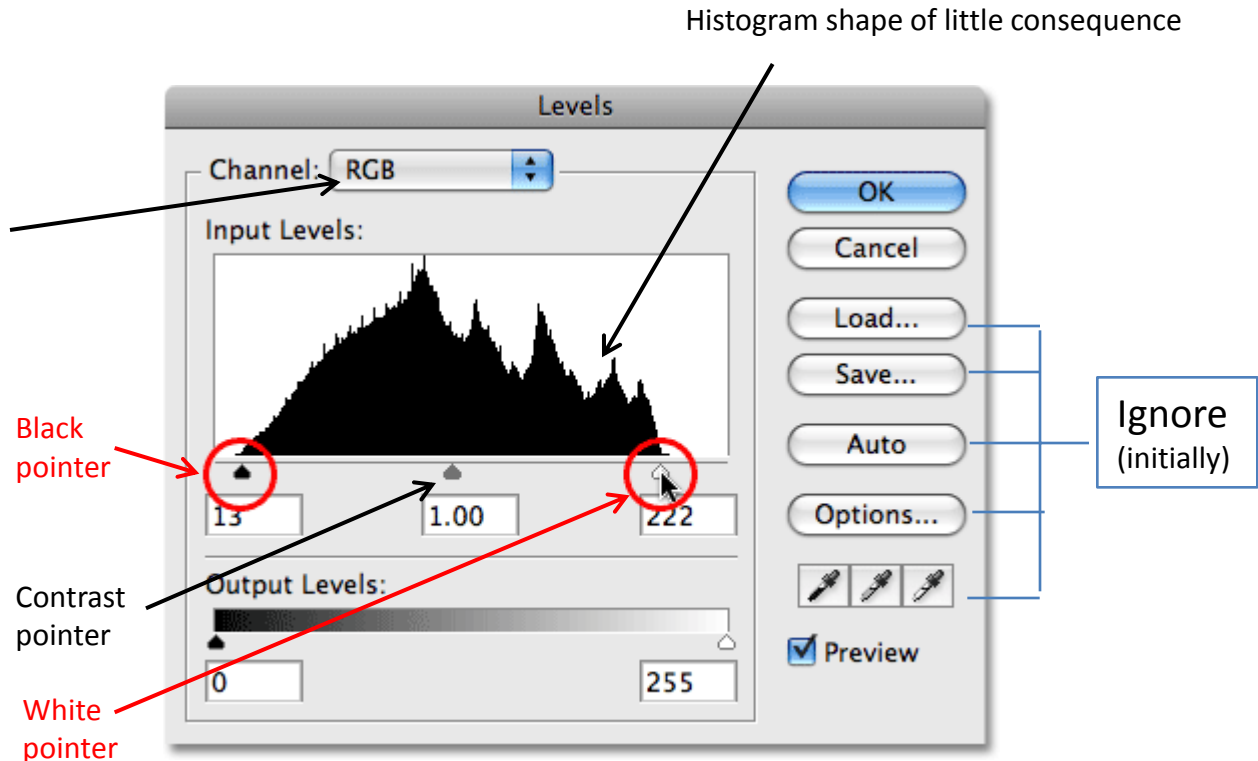
I. Adjustment of Contrast and Colour

Two steps:

1. To correct for contrast apply the **'Levels ...'** adjustment layer. Under 'Channel' adjust RGB Histogram for overall contrast. Ensure the Histogram extends the full range from black to white by moving the black and white pointers. Click 'OK' to save.

2. To control colour apply another **'Levels ...'** adjustment layer and under 'Channel' choose the Red, Green and Blue channels one at a time for colour correction and manipulation. Click 'OK' to save.

When finished compress all layers into one image; go to menu bar: > Layer > Flatten Image.



A note on adjustment layers:

The use of these layers has a major advantage in that they are forever editable and do not alter the pixels in your original image. If you have a choice, use **'Curves ...'** (see later comments) in preference to **'Levels ...'** as it provides more control over the image; both are easy to use and the effects will be immediately apparent on your image. Another useful adjustment layer is **'Hue/Saturation ...'**.

II. Dodging and Burning

While there are dodging and burning tools available in Photoshop, they directly alter the original image as well as being somewhat clumsy in use. A much better and more controlled means of dodging and burning that does not alter the pixels in the original image is to apply the following steps.

Three steps: *(There is no need to ‘understand’ these steps; just perform them monkey-like.)*

1. Create a new layer
2. Change this layer’s blending mode from ‘Normal’ to ‘Overlay’
3. Go to menu bar: > *Edit* > *Fill ...* Choose 50% gray (100% opacity). Click ‘OK’.

You now have a neutral gray layer like an adjustment layer over the image.

Dodging:

have the B&W switch (at the bottom of the ‘Tools’ bar) with **white** foremost and use the **brush tool** to ‘paint with light’. On the ‘Tools options’ bar set the brush **opacity** at around 10% to begin with and adjust the **size** of the brush to suit. Opacity and the size of the brush can be adjusted either way for greater or lesser effect.

Burning:

follow the same procedure with the B&W switch set to **black** foremost.

When finished, flatten the image.

Commonly-used actions from the menu bar

1. To fit the image fully on the screen: > *View* > *Fit on Screen*
2. To change document size for printing: > *Image Size ...* and change the ‘Document Size’ to suit (ensure “Resample image” is NOT ticked) Click ‘OK’
3. To flatten the image (i.e., reduce all layers into one [new] Background): > *Layer* > *Flatten Image*

III. Working on selections of the image

Use of polygonal lasso tool

1. Often we wish to work on only a selected parts of the image. While there are many ways of selecting a portion of the image, the most reliable way is to use the **polygonal lasso tool**.
2. Using the polygonal lasso tool is slower than some methods but it does provide an accurate outline of the required selection (or selections).
3. The tool creates straight-line sections as you drag and click around the object you want so you can control the accuracy of following a selected outline to any desired degree.
4. In '**Tools options**' set '**Feather**' at 5px as the default choice. (Smaller values will give a sharper outline and larger values a more blended outline.)

Using the selection

1. Once a selection is made then anything you do, such as in steps I and II above, will apply **only** to that part of the image that has been selected.
2. In cases where you wish to select the remainder of the image (and excluding your original selection) go to menu bar: > *Select* > *Inverse*.

*In Photoshop (but not available in Elements) an extremely useful selection technique is found by going to menu bar: > Select > **Colour Range** ... Here you can choose from the 'Select' drop-down menu Highlights, Midtones or Shadows, or any of the colours listed, or use the **eye dropper tool** to select a particular colour in your image.*

Sharpening

- some sharpening is usually required with RAW-derived TIFF files

A better approach to sharpening than what is offered within Photoshop is to do the following:

Four steps: *(There is no need to 'understand' the first three steps; just perform them monkey-like.)*

1. Go to menu bar: > *Layer* > *New* > *Layer via Copy*
2. Change the blending mode from 'Normal' to 'Overlay' (*ignore effect on image*)
3. Go to menu bar: > *Filter* > *Other* > *High Pass ...*
4. Adjust **Radius** up to 10 pixels (no more) for the desired sharpening effect. (Make sure 'Preview' is checked.) Click 'OK'.

This process sharpens the entire image via 'Layer 1' and doesn't alter the pixels in the original image.

Sharpening part of the image only

If only part of the image is to be sharpened, first make the required selection* (e.g., by using the polygonal lasso tool) before proceeding with the four steps above.

When finished, flatten the image.

** This selection can be quite 'rough' as in sharpening we are dealing only with edges within the selection and the boundary between the sharpened and non-sharpened part of the image will be mostly indistinct.*

A note on adjustment layer:

‘Curves ...’

Similar controls to ‘Levels ...’ with the added advantage of being able to change the **Characteristic curve** to any shape desired.

‘Preset’ options a good place to Start when changing the curve.

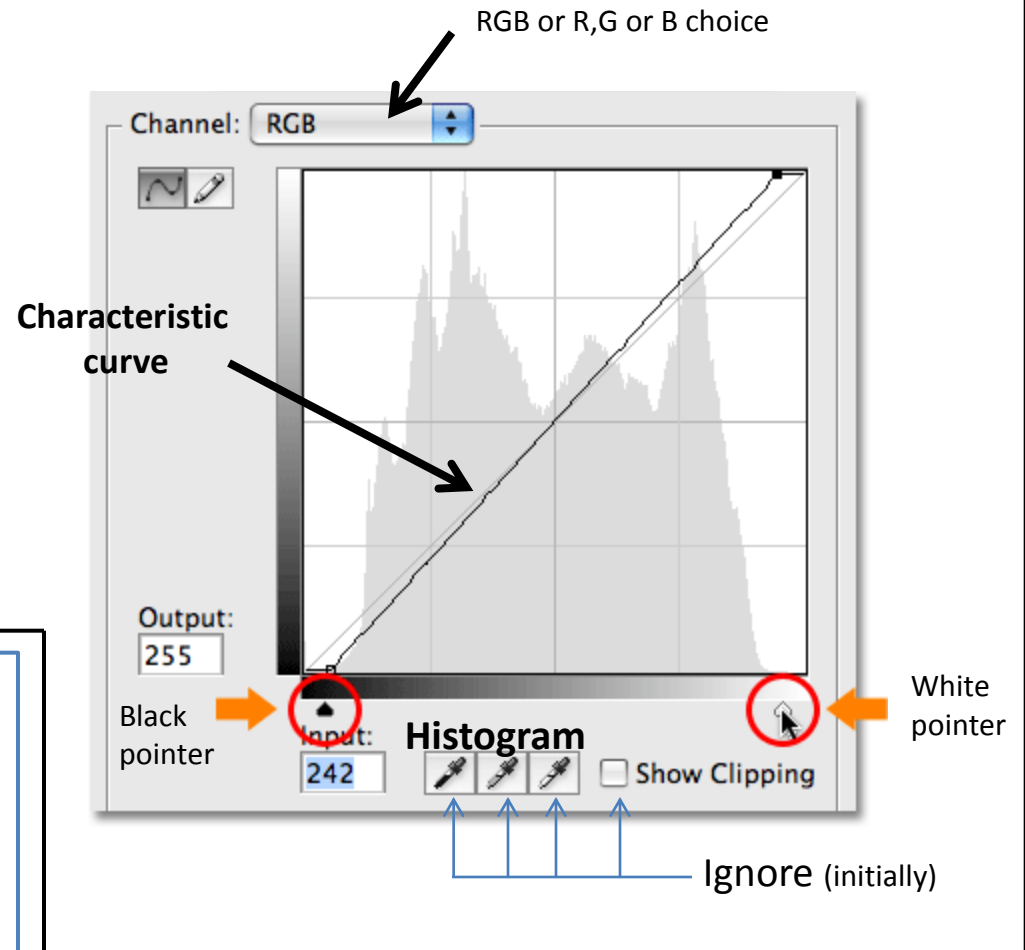
The Clone Tool

This is one other main tool of interest where you can take a sample of the image from one part and dump it anywhere else you choose. Among other attributes, it is useful for covering unwanted parts of the image such as white spots or lamp-posts sticking out of heads.

Adding ‘Curves’ to Photoshop Elements

‘Curves ...’ does not come with Elements but it is such a useful tool in Photoshop which, fortunately, can be added free to Elements. Type ‘photoshop elements curves’ into Google and a number of options will appear depending on your version of Elements. A useful address is:

<http://forums.dpreview.com/forums/read.asp?forum=1006&message=32762196>



Computer resources for image processing

Image processing is greedy when it comes to computer resources.

'A picture is worth a thousand words' is never truer when it comes to digital processing!

For example, a Word document for text may take around 40KB of memory while a single picture can easily take 1000 times more memory than this at 40MB.

The basic requirements are:

- 1) a decent-sized monitor (around 23 " is ideal) with IPS-type panel display (see box);
- 2) a minimum of 2GB of memory (RAM) but preferably 4GB;
- 3) a dedicated graphics card.

LCD (Liquid Crystal Display) Monitors

There are several different types of LCD technologies that differ markedly in the way they reproduce colours and tones. All you need to be aware of are the extremes of this technology. At the bottom end are cheap TN-type displays which are quite unsuited for photographic purposes as they have a narrow angle-of-view and do not reproduce colours accurately. This type of display is found in most PC laptops and cheaper monitors. The best monitors have IPS-type displays (as found in high-end Apple Macs) which have a wide angle-of-view and reproduce colours best of all. For serious photographic work you should have an IPS-type display monitor if at all possible. Fortunately, they are now a lot more affordable than previously with some current models under \$300 for a 23" screen.

Mac's or PC's?

Historically Macs have been the industry standard for image processing. However, over time the technical advantages of Mac's over PC's has become less obvious and either platform will perform well provided the basic requirements mentioned on the previous slide are met.

Laptops or Desktops?

PC laptops



- Portable
- small monitor of poor quality
(if you already own a laptop you will need to purchase a decent-sized quality monitor – see previous page.)
- limited processing power
There is usually no dedicated graphics card (and an upgrade is not possible).
- expensive
(for what you get)



Macbooks

Meets the basic requirements except the screen size is probably too small. Expensive.

PC Desktops



The two individual components of **Tower** (which comes with a keyboard and mouse) and **Monitor** can be purchased separately.

- Requirements of 4GB of RAM and a dedicated graphics card are standard
- Unlike laptops, the system is upgradable
(e.g., the graphics card can be upgraded if desired)
- Much cheaper than Laptops and iMacs.
Best choice if you don't need portability.

Imacs

High performance assured but expensive compared to a PC desktop system.

