



The  
**Royal  
Photographic  
Society**

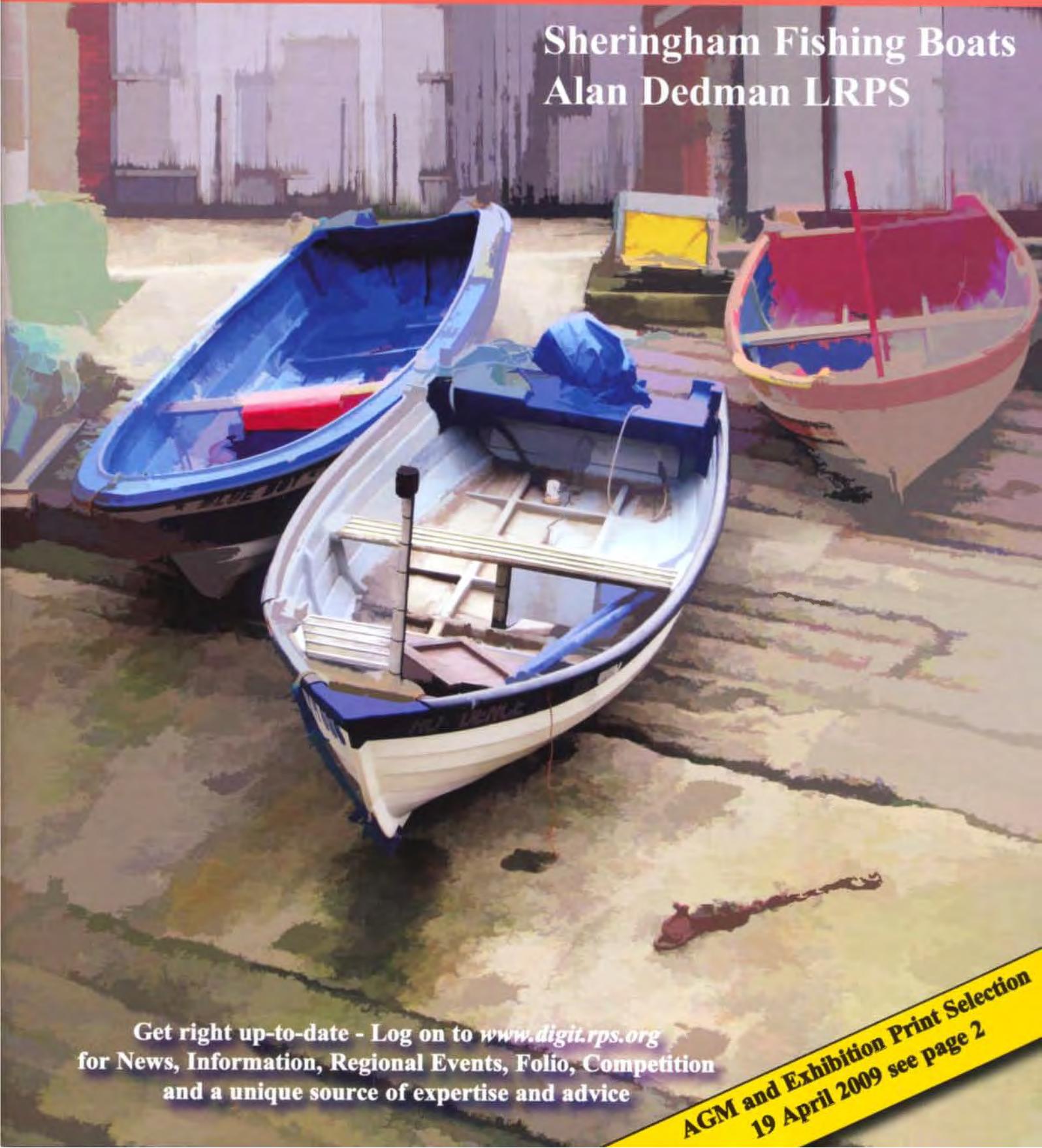
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**DIGIT**

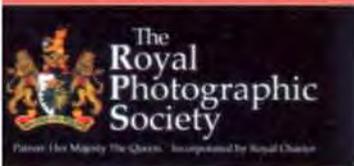
**SPRING 2009 Issue No 41**

## Sheringham Fishing Boats Alan Dedman LRPS



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for News, Information, Regional Events, Folio, Competition  
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**AGM and Exhibition Print Selection  
19 April 2009 see page 2**



**Digital Imaging Group  
Committee for 2008/09**

See opposite page for DIGRO contact details.

**Chairman: Clive Haynes FRPS**

01905 356405

[chairman@digit.rps.org](mailto:chairman@digit.rps.org)

**Vice-Chair and**

**DIGRO Co-ordinator**

**Chris Haydon**

01234 782196

[chrishaydon@digit.rps.org](mailto:chrishaydon@digit.rps.org)

**Secretary: Bob Pearson FRPS**

01404 841171

[secretary@digit.rps.org](mailto:secretary@digit.rps.org)

**Treasurer: Elizabeth Restall LRPS**

01453 844389

[treasurer@digit.rps.org](mailto:treasurer@digit.rps.org)

**Publicity and Website:**

**John Long ARPS**

01179 672231

[johnlong@digit.rps.org](mailto:johnlong@digit.rps.org)

**Exhibitions: Alex Dufty LRPS**

01454 778485

[exhibition@digit.rps.org](mailto:exhibition@digit.rps.org)

**Maureen Albright ARPS**

01672 540754

[maureenalbright@digit.rps.org](mailto:maureenalbright@digit.rps.org)

**Tony Healy ARPS**

+61 (0) 2 9958 1570

[anthonyhealy@digit.rps.org](mailto:anthonyhealy@digit.rps.org)

**Graham Whistler FRPS**

01329 847944

[grahamwhistler@digit.rps.org](mailto:grahamwhistler@digit.rps.org)

**Cesi Jennings LRPS**

01275 372200

[cesijennings@digit.rps.org](mailto:cesijennings@digit.rps.org)

**Dr Barry Senior HonFRPS**

Ex officio

01425 471489

[presidentrps@digit.rps.org](mailto:presidentrps@digit.rps.org)

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Welcome to the spring 2009 edition of DIGIT. To keep you sharp, look out for the discount offer to *DIGIT* readers for FocusFixer V2 on p14 from *FixerLabs*. And on the back cover *Permajet* are offering an Ecoflo continuous ink system and paper at a special price.

I want to update you on the *e-Group Messaging System*. You will recall that in the winter issue we asked you to be on the look-out for an e-mail message about a new DI Group message distribution system. Our intentions were good but as so often with something new things went awry. We're going to try again. The idea is to set up an e-mail message group for better communication with DIG members. The main reason for establishing the e-mail group (an e-group) is as a more efficient means for the DIG committee to let everyone know from time to time of important notices and updates about such matters as our exhibition, the AGM, special meetings, events and so on. The e-group will be a 'closed group', that is to say no one can join the group except by invitation.

The e-group is not being set up for messages to be circulated around the group by members. Only messages approved by the e-group moderator can be sent. The appropriate place for topics of interest and discussion will continue to be the DIG website Forum which members will be encouraged to continue to use.

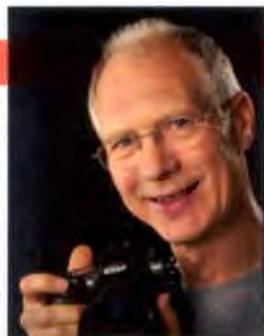
Very soon all members will receive an e-mail message with an invitation to join the e-Group. The facility is a secure site with the safeguard that people can join only by invitation. Naturally you can leave (unsubscribe from) the e-Group at any time.

We can invite you to join only if we have your current e-mail address. If you're uncertain as to whether we have your up-to-date details please let Bob Pearson have them at: [secretary@digit.rps.org](mailto:secretary@digit.rps.org) It's also key to update the Society at Bath. Contact Simon Bibb on 01225 3257433 or [simon@rps.org](mailto:simon@rps.org) The *DIG website* is certainly a topic that has exercised your committee for many months. At last there's good news on the horizon. The RPS has been in discussions with the web-specialist company Omni and this has resulted in a web-page design being made available for all the Society's Specialist Interest Groups. Details of the design evolved by the Society and Omni will be revealed shortly, though unfortunately not in time for this edition of DIGIT. We will be very keen to tell everyone about what will be available to DIG within this new website facility and we hope to let you know as soon as possible - yet another good reason for the new e-group.

Whilst on holiday in France in the autumn, I was unlucky enough to lose around 75 images on a corrupted CF card. Try as I might, the data refused to reappear. Fortunately *Palmer Data Recovery Ltd* of Kingston-upon-Thames successfully retrieved all the lost files. We happily rely upon our

computers and memory cards to function continuously without failure and it comes as something of a shock to experience a hard drive failure, corrupted files or perhaps a disaster such as accidentally dropping a portable drive and damaging the sensitive mechanism. The answer, as we all know, is to back-up data on a regular basis and to keep copies securely. But how many of us follow this golden rule? All too few I suspect. I for one will not delete a memory card until I've copied the contents to a disk. There's an article from Palmer Data Recovery on page 23.

By invitation of the RPS, I had the pleasure of making two visits to the *Focus on Imaging Exhibition* at the NEC in February. On the Sunday I was one of the panel members for Licentiatehip assessments and on Monday I presented a talk about Digital Infrared Photography. I'm very pleased to report that the Licentiatehip assessments went very well with a high percentage of success with many outstanding panels submitted. The show was absolutely buzzing and the stands were busy with lots of new equipment on display. The demonstrations were well attended and the images on show were of a high standard. All this activity, vibrancy and intensity of interest about our art, coupled with state-of-the-art equipment, is wonderful. But how can we begin to draw together all this endeavour, enthusiasm and creative output? We should encourage photographers to meet and share their work and explore their visions by informed discussion. Camera clubs are one outlet for such activity, the RPS is another, while many photographers prefer to participate in on-line folios or to meet for informal group discussion sessions. However we prefer to share our unique visions of the world we can be certain that, in these days of economic pessimism and the stygian gloom of recession, involving ourselves in a creative pursuit is one of the greatest antidotes to the continual diet of bad news. Spread the word and encourage your colleagues to join us in the DI Group where together we can continue to celebrate our individual visions and appreciation of the world about us through photography.



*Clive Haynes FRPS  
Chairman*

*Clive Haynes FRPS*

**DI Group AGM and Exhibition**

Print exhibition postal submissions by 9 April or bring prints to the AGM on 19 April 2009. See centre fold of winter DIGIT for AGM Notice, agenda, exhibition arrangements. Please prepare or send your prints and fee and book your lunch NOW! Forms: [www.digit.rps.org/pdfs-digit/2009rules&entry-digit-ex.pdf](http://www.digit.rps.org/pdfs-digit/2009rules&entry-digit-ex.pdf)

## Welcome to Dr David Cooke: New Associate Editor for DIGIT

It's good to be able to report that the DIGIT team has doubled in size with David Cooke joining Jim Buckley to assist in producing the quarterly magazine. David has made an immediate impact as you can see from the quality and size of the Spring issue.

Like many photographers, David has been interested in our hobby since he was at school. His father was a keen photographer and so he had access to a small darkroom at home. He was very active at school as a photographer, taking most of the images for the school magazine and later, at Leeds University, he worked on the weekly student newspaper, firstly as Pictures Editor and later as Features Editor and then Assistant Editor. After graduating and subsequently getting his PhD in combustion engineering, he worked in industry and local government before joining the Open University where he is now a Senior Lecturer and Staff Tutor. During this time photography took a back seat until he was given a Nikon D70 for his birthday three years ago and the love of making images was rekindled.



Professionally, David is a Chartered Engineer and Fellow of the Energy Institute. He has experience of producing teaching materials, written, audio/visual and computer models, in the environmental field at both undergraduate and postgraduate level, and of chairing both the production and presentation of distance teaching courses. His main academic field of interest is in computer modelling of environmental engineering systems.

Contact David on: [d.f.cooke@open.ac.uk](mailto:d.f.cooke@open.ac.uk)



Night Steam Darjeeling Railway by Graham Whistler FRPS. Pages 42 onwards for report on the DIG India Tour

### DATES FOR YOUR DIARIES

#### YORKSHIRE

Saturday 25 April and

Sunday 26 April

Two Day Print Exhibition

North Light Gallery

Brooke's Mill, Armitage Bridge

Huddersfield, HD4 7NR.

Contacts: see box on right

#### THAMES VALLEY

Sunday 29 March: Gavin Hoey on Photoshop.

Sunday 26 April: Roger Reynolds FRPS Never Ending Journey.

Sunday 31 May: Annual Digital Projected Image Competition.

Sunday 27 September: Ray Spence FRPS Alternative Techniques

Sunday 22 November: AGM and Millennium Cup Competition

Contacts: see box on right



### DIGITAL REGIONAL ORGANISERS

Contact the organisers listed below for full details

#### Thames Valley

Roger Norton LRPS

[www.rpsdig-thamesvalley.org.uk](http://www.rpsdig-thamesvalley.org.uk)

[digro@rpsdig-thamesvalley.org.uk](mailto:digro@rpsdig-thamesvalley.org.uk)

#### East Anglia

Vacant

#### East Midlands

Bob Rowe ARPS

[www.rpsdigital-em.org.uk](http://www.rpsdigital-em.org.uk)

[bob.rowe10@ntlworld.com](mailto:bob.rowe10@ntlworld.com)

#### Midlands

Clive Haynes FRPS

[www.midig.org](http://www.midig.org)

[clive@crhfoto.co.uk](mailto:clive@crhfoto.co.uk)

#### North West

Harry Bosworth

[harrybos@aol.com](mailto:harrybos@aol.com)

#### Scotland

Vacant

#### Southern

Dr Barry Senior HonFRPS

[barry@littlepics.freesrve.co.uk](mailto:barry@littlepics.freesrve.co.uk)

#### South Wales

Maureen Albright ARPS

[www.southwales-dig.rps.org](http://www.southwales-dig.rps.org)

[maureen@maureenalbright.com](mailto:maureen@maureenalbright.com)

#### Wessex

Maureen Albright ARPS

[www.digwessex.rps.org](http://www.digwessex.rps.org)

[maureen@maureenalbright.com](mailto:maureen@maureenalbright.com)

#### Western

Tony Poole ARPS

[tonypoole@blueyonder.co.uk](mailto:tonypoole@blueyonder.co.uk)

#### Yorkshire

Robert Croft LRPS

[http://yorkshire-](http://http://yorkshire-digi.mysite.orange.co.uk/)

[digi.mysite.orange.co.uk/](http://digi.mysite.orange.co.uk/)

[robert@robertcroft.wanadoo.co.uk](mailto:robert@robertcroft.wanadoo.co.uk)

DIGIT is printed by Ian Allan Printing, Riverdene Business Park, Molesey Road, Hersham, Surrey KT12 4RG

# Getting the right Temperature

**Bob Pearson's useful guidance on correct colour temperature obviously went down well. Dr Andrew Peckett wrote with a question and to bring us up-to-date on the units which take their name from Lord Kelvin (shown right).**



*Lord Kelvin 1824 - 1907  
See DIGIT Winter 2008  
Issue No 40*

**Have you got something to add to an article or just something to say about DIGIT? Do please let us know at [editor@digit.rps.org](mailto:editor@digit.rps.org)**

DEAR MR PEARSON

I found your article in the current DIGIT an interesting summary of colour temperature and how one can avoid problems by shooting in RAW and using the Gretag MacBeth colour checker chart or a grey card. The illustration shows dramatically the effect of correct colour management and how easily it is achieved using ACR.

I have used a grey card for many years - even pre-digital when used in wet colour printing - and I have found that the suggestion that cloudy weather has a colour temperature of 6000 K is never correct; it always measures much lower, typically around 4800 K. Odd, or have you found the same?

There is one technical point I should like to make. In 1967 the international committee which looks after scientific units, CGPM to use its French acronym, changed the unit of thermodynamic temperature from degree kelvin to just plain kelvin, and dropped the degree symbol (standard font character 0186). Notice that the scientific unit has an initial lowercase first letter and is always singular, the symbol is a single capital letter, but (Lord) Kelvin of course has an initial capital letter.

So colour temperatures should be stated as eg 5200 K or 5200 kelvin. The reasons for the change were twofold: no SI scientific base unit should require more than a single word; the word degree was to be restricted to its use in angular measurements (and even here it is a permitted non-SI unit and radians are commonly to be preferred).

Of course, in everyday life we still use the expression 'degrees celsius' and its symbol °C for temperatures in weather forecasts etc but in colour science the kelvin and symbol K should be used.

Sadly, a number of manufacturers like Adobe have still not always followed the requirement, or at best their literature is internally inconsistent.

Andrew Peckett

Bob Pearson commented:

Thank you for updating me on the international unit for colour temperature. I tried to keep the article brief yet instructive to new comers to the subject. We will avoid the continuing mis-use still found in current literature. Thank you for bringing it to our attention.

On a quick scan of the 'as shot' colour temperature of my images taken in the UK under cloudy conditions I would agree that the range 4200 - 4900 K is typical. My images are not taken at midday and are usually taken in autumn through to spring.

On the few shots with clear sunny skies 5300 K was typical. However, I have experienced images taken under cloud, where one can visibly see the blueness of the light, which register well in excess of 6000 K. I think it is the term 'cloudy' that is really too vague to cover the range of colour temperature that can be measured under so called cloudy conditions.

Bob Pearson FRPS

## Articles and Images for Summer and Autumn 2009 Copy Dates 20 April and 30 September

DIGIT relies on the contributions of members. So, when will you send me an article for DIGIT? Remember that everyone is learning and that all experience is valuable.

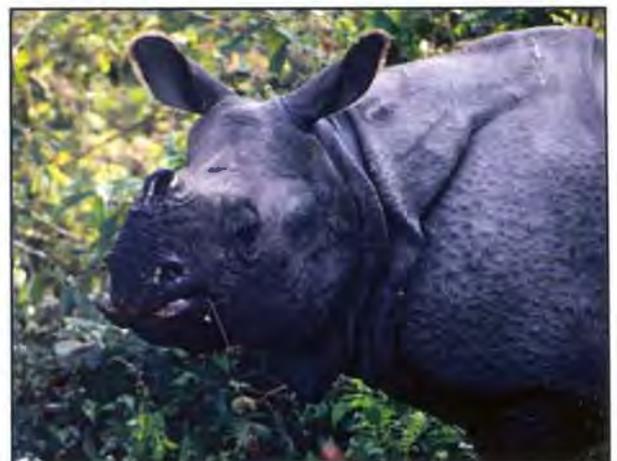
You don't need to be an expert writer - we'll help you if necessary. We need How To articles with your favourite digital techniques and of course your brilliant images. We know you're out there so we look forward to hearing from you. Thank you.

**Jim Buckley LRPS Editor**

Email: [editor@digit.rps.org](mailto:editor@digit.rps.org)

1 Aldenholme, Weybridge, Surrey KT13 0JF, UK

*Not quite the proverbial black cat in the coal hole but a one horned rhino from Northern India. No doubt challenging on more than an accurate colour balance, this magnificent beast was photographed by Eddy Lane LRPS on the DIG India Tour. See pages 42 onwards for a report and pictures.*



# MY JOURNEY TO FELLOWSHIP

It seemed to Gwynn Robinson that every possible image had already been captured, all subjects 'clicked' to death. Most photographs seemed to be old news. It had all been done before and done well too. How on earth, Gwynn wondered, could he create something new, interesting and worthy of an accreditation by the RPS?

I started from a difficult position in 2001 having just been diagnosed with a brain tumour and seriously failing eyesight. I had decided to take up photography and do the best that I could do with the eyesight that I did have left.

I changed everything: camera equipment, knowledge, and attitude. I bought the best digital camera that I could, lots of books, a computer, joined a local photographic society. It took a lot of courage to get going and to start to use the equipment and to really learn. The learning curve was going to be very steep but it was going to be fun. The first results were pretty poor, but I was delighted with it all anyway. The images were great (to me). My enthusiasm grew and grew. I took pictures of everything and anything. No style, just delight.

*Below: Winners' – One of my early winning images – simple but effective*



The brain surgery not only removed the tumour but also completely restored my sight. It taught me a very valuable lesson - we can dumbfound the so called experts - we can be more than even we ourselves believe.

As I recovered I continued to develop my skills. I decided that I would start a journey towards improved competence and confidence in my photography.

I am a concept artist. I love to express and illustrate concepts, abstract ideas, thoughts and emotions. Imagine my turmoil in trying to ally my world with the traditional photography we see all around? My journey almost stopped right at the start. It seemed that everyone in photography was taking photographs of traditional things such as landscapes, portraits, sport, macro, etc. I wondered how could I possibly do well when I seemed to have such a different approach to everything.

I was discussing things with a friend when I noticed that a pen I was holding seemed to have similarities to a flower - the concept was born. The journey was saved. A themed LRPS on the concept of mimicking flowers with arrangements of pens. It worked. I gained the L with the Flower Writing panel shown below.

Naturally I turned towards the ARPS. I discussed possibilities for quite a while. In the meantime I had taken a series of photographs of a rather beautiful old house being demolished. I had taken a few weeks out to take over 4000 images of the demolition in all weathers, times of the day, and light conditions. I really learned how to use my camera and to take photographs during that project which you can see on the next page.

## FLOWER WRITING



Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Image 7



Image 8



Image 9



Image 10

*Death of a Princess*



The Princess



Regal and Proud  
(Before the End)



Arrival of the  
Executioner



Arrival of the  
Assistants



The Crown Falls



Defiant last Stand



Keeping Guard  
- Dusk



Lonely Vigil  
- Dawn



Execution -  
Hung



Execution -  
Drawn



Execution -  
Quartered



Building the  
Funeral Pyre



Bone Yard



Casket



Victor

*Above: Death of a Princess  
The ARPS panel*

I actually didn't think that pictures of a house being knocked down would interest anyone. It was traditional work and that was not my main strength. What clinched it for me was the developing concept about the house. The concept of 'the death of a princess'. To me the house was a beautiful princess. To see it being demolished was very painful. The concept shaped the story I would tell to the ARPS assessors. It determined the exact images that I would use. It changed a rather dull set of images into an interesting story. I was hooked. I loved the concept. It was tough selecting the right images, but it was

exciting and fun and it was traditional as far as the images were concerned. The A was a success. FRPS was the next natural step. I had won a few competitions, learned so much, developed a style. But my style was not traditional. It was conceptual. How could that possibly be applied to an FRPS? I decided to do a Fellowship panel based on purely conceptual ideas. Nothing traditional at all. It was a risk. But then the F is all about pushing the boundaries of photography forwards. I decided to highlight different human emotions using inanimate objects in representative created

*I Feel...*

1



*Angry*

2



*Happy*

3



*Friendly*

4



*Lost*

5



*Amazed*

11



*Entranced*

12



*Appreciated*

13



*Hopeful*

14



*Vengeful*

15



*Serene*

scenes together with the use of extensive computer manipulation. A very tough project to pull off. But for me, great fun, tons to learn and huge amounts of effort to put in.

Almost by accident I rang the Society and learned that to enter the next assessment I needed to get the entry to them within three days! A rather busy weekend ensued as I had to print and mount everything. A single slip could have wrecked everything. But it all went well (ish).

The closer I got to completing the entry the more worried I became. What if the assessors hated my type of work? It took courage to do it all, but the panel was posted on the Monday morning, on time.

It seems that the assessors had never seen a panel quite like it before and they were split in their decision. They decided to pass it to the next set of assessments. The second set of assessors, some months later, passed my panel, which I had called *Feelings*. What a journey!

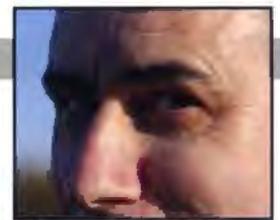
So what did my journey teach me?

- Learn to take/create the very best images;
- Learn how to use the technology to advantage;
- Develop a recognisable style;
- Set yourself a project, or take part in a project or a competition;
- Have a solid idea for the panel and stick to it;
- Aim for the highest standard possible. Never accept second best;

- Never give up;
  - Have self-belief. Take advice, listen to criticism, but trust your own instincts;
  - Learn, learn, learn;
  - Enjoy, enjoy, enjoy;
- Has my journey ended with the F? Not a bit of it. I continue to improve.

I ran an online photographic society for the last 18 months but, alas, the increased stresses in people's lives meant that they had no free time to 'stop and stare'. It failed because people did not have enough time to make it work.

I have expanded into traditional photography along with my conceptual work and now moved into music composition - a new journey...



*Below: Homing Beacon  
Created from a  
monument on Blackpool  
Pleasure Beach Prom*



## *I Feel...*

6



*Frustrated*

7



*Thrilled*

8



*Confused*

9



*Peaceful*

10



*Dishonest*

16



*Daring*

17



*Tempted*

18



*Secure*

19

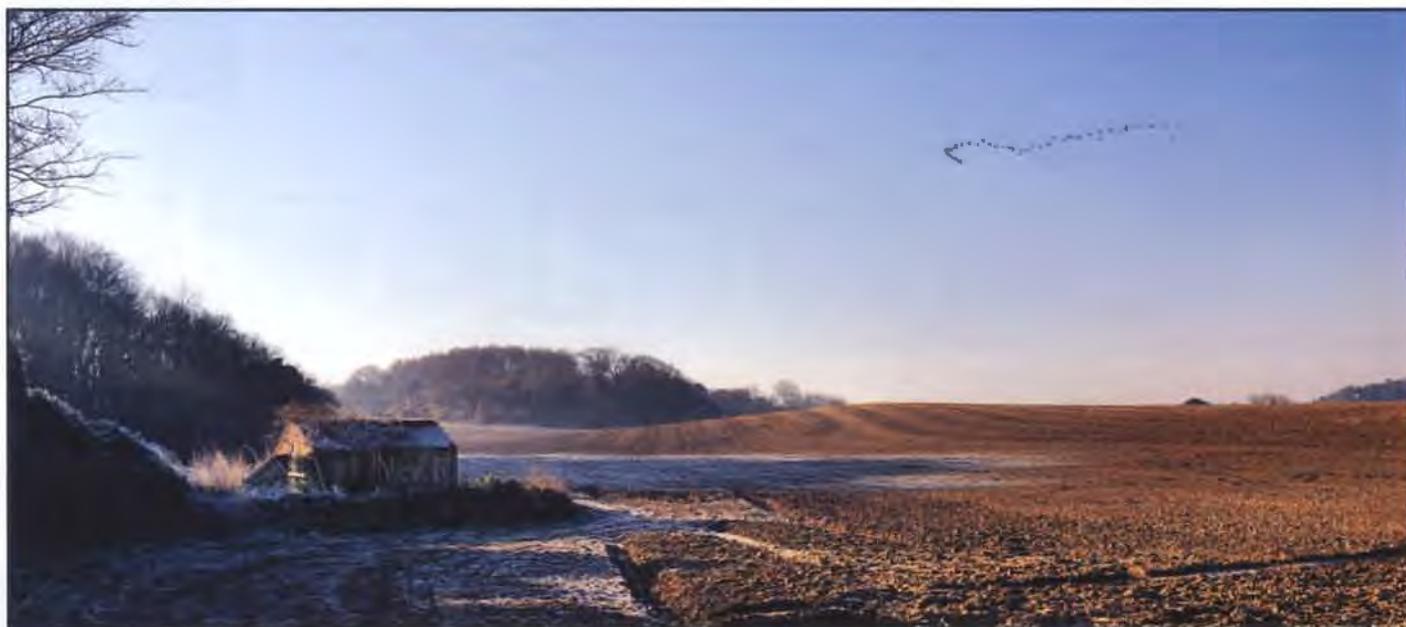


*Loved*

20



*Passionate*



*A field in February*

## NORFOLK SKIES

**Alan Dedman has been photographing Norfolk's 'big skies' for many years. Here he explains his fascination for the subject and how he achieves his impressive images.**

I must be daft. I enjoy going out early on cold, clear and frosty winter mornings. Me, the dog and my camera. Mind you, if its particularly cold the frost stays around till about 10/11 o'clock, which does give me time to have some breakfast. Sunrise, or thereabouts is the time I like the best. Just us dog walkers, a few birders and the sounds of a rabbit shoot in the far distance.

Living in such a lovely country area, as well as being on the coast gives me the ideal opportunity to take landscape, and seascape, photographs. It took me a while to understand what I wanted from a landscape and how best to use the camera to obtain it. Needless to say, I am still learning and only hope my images get better as I go. We don't have mountains and valleys, so I have to exercise my compositional brain with broad views of flat lands and wide-open beaches. I know it's all been done before, but not by me it hasn't and it's my wish to show these places as I see them.

I am not keen on the 'few rocks in the foreground, slow motion sea and distant hills', type of landscape. I prefer the wide-open views with a focal point, be it an object or diminishing perspective on the horizon. This tends to mean that, more often than not, I include the sky.

John Betjeman said 'wide East Anglian sky', and

others have mentioned Norfolk's big skies. I try to capture these and am often told off for including too much sky. I try to include just a little more than the recommended two thirds and often I stretch the image, keeping the width the same, by some 100 pixels, or more. However, to show the sky at its best you do need a strong focal point on the horizon. Fortunately Norfolk is blessed with lots of churches and you can usually get to position one on the horizon to show off the sky at its best. Without an interesting sky I do try to fill the blank with over hanging branches, or do two-thirds land and one-third sky.

Some of the landscapes I take are planned, in that I see a likely place and then wait till I think the weather conditions will be right, others are not planned and just seem to happen. I now carry a compact camera for these, along with my DSLR camera. In the past I have been caught out. I've been shooting an HDR shot, on a tripod, and the 'happening', like a dog walker or a skein of geese going by, has occurred when I'm either two stops over or under. Very difficult to recover from even with a RAW image. When luck is with me these occur when I'm shooting in hand held, single shot mode.

After the taking comes the cropping, cloning,



*Salthouse Church*



*Hurrying home*



*The path to Felbrigg*

burning and dodging. I try to get as much right in the camera before I press the shutter button, but it doesn't always happen. With most images I find I need to do some burning or dodging just to make sure the focal point is indeed the focal point. I could, as we all could, put another sky in, but I try to work with what I've got in the image. With more local shots, I decide to go to take them only when I think the sky is right.

Why convert some images to monochrome? Well, it's a difficult question to answer. Some images I look at and think they would be better monochrome. It doesn't always work out. When I think it does, I then do a quick print and over the course of some days look at it and try to decide if it would be better with this area, or that area, accentuated or toned down. Now and again I think it would be nice to have a slightly sepia look. Makes it look almost timeless.

Some images look better if treated with a Simplifier. Again, this is really a case of doing it and deciding if you like it or not. A Simplifier will take out some of the smaller detail and merge similar coloured areas together. If you use this with a mask, you can paint in the areas you wish to simplify, or those you wish

to remain with full detail. I mostly use the old Greek maxim, 'Nothing in excess', with a simplifier. However, there are times, when the shapes are strong enough, that you can go mad and use it in a much more fuller manner. The Simplifier I use is called 'buZZ'. Unfortunately this is no longer available, but I understand there are others on the market.

Last, but not least, comes the showing to my fellow photographers on the DI Group Website, who give me useful hints and ideas. Only then do I think of printing it.

I have a web site <http://www.dedders.co.uk> which really is for my enjoyment, (others may think its an indulgence), but it does come in handy now and again.

Explaining to others why I take a particular photo/image is, I find, difficult. It's like, if I stop to think how I walk, I then trip over!

Getting an image that I am pleased with is the most rewarding aspect. I hope it conveys what I saw and, even, what I felt on that day, looking at that scene. Obviously it should all be for fun and something you love to do. I hope others will share this and perhaps feel the same.



*Looking toward Cley*



*Gone fishing*

# START HERE - AND KEEP IT SIMPLE MAC!

## PHOTO FILES FROM CAMERA TO COMPUTER IN THE APPLE MAC

Tony Healy is a long time Apple Mac user and devotee. The Mac comes ready to go with photo software - and more - already installed so it's ideal for those starting out in digital photography. Tony explains just how easy it is. And on page 20 he makes a Photo Book.



When you buy a digital camera you not only get the camera but a few bits and pieces as well. There is the charger for your camera battery, the USB cable and the DVD with all the software. The DVD disc contains the company's software that they suggest you use to download and manage your images. Unfortunately this software can take over your images and remove your full control. In the case of a Mac computer there is another way.

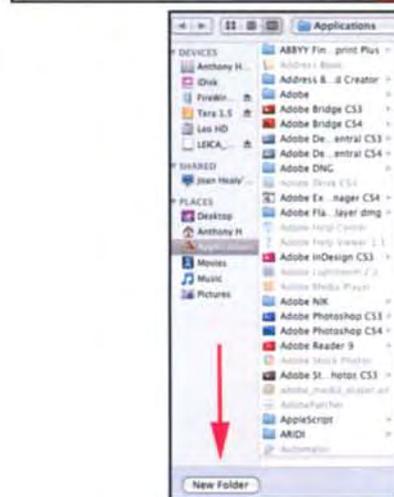
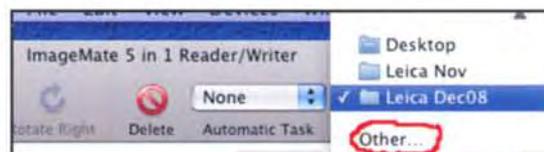
With your Mac comes a program called Image Capture. Go to your applications folder and double click to open it. There are a couple of options on controlling your downloads. First you will receive a dialogue box that says: **No Image Capture device connected.** Ignore that for the moment and go to the menu across the top of the window and select **Image Capture>Preferences** (see left) and here you can tell Image Capture what to do when your Camera or card device is connected to your USB port.

You can choose either to open **iPhoto**, **Image Capture**, **Nothing** or a **folder** of your choice - see left. It's best to select **Image Capture**. Having made that option click OK and in the next step you are ready to utilise the features.

For an easy way to transfer the images from your removable Flash Card to the Mac you should purchase a Card Reader. These are readily available from most photographic shops. The illustration on the left shows two versions of these readers. Take the Flash Card out of your camera and insert it into the Card Reader. The Reader is supplied with a USB cable so plug the Reader into the cable and the cable into the USB port of your computer.

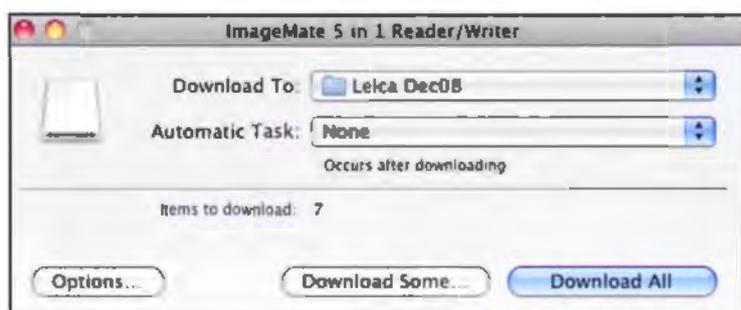
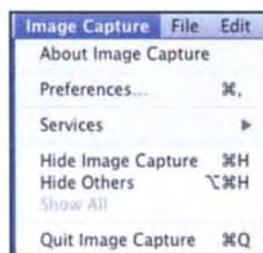
Image Capture will now open due to your Preference settings and will offer further choices for downloading your images and placing them in your computer. Below you will see the options you have for downloading your files.

**Download** to allows you to select where you want your images stored. It will provide some previous locations and if the one you want is not there then select **OTHER** to navigate to your preferred location. The **OTHER** option also allows you to create a **new folder**, as shown below:



**Automatic Tasks** gives you some options for sizing and cropping your images before downloading. These are tasks best kept for iPhoto. Photoshop Elements, Photoshop, or any other application. Option **NONE** is the best selection.

**Options** (see below) gives you the choice of deleting the images from the card after downloading- Creating custom icons-Adding item info to the Finder File comments and **Embedding ColorSync** profiles with the option of selecting a profile. It is a better choice not to delete the items from the card after downloading as you can also download them to another location like an



external Hard Drive as a back up.

Adding comments to the Finder file is more of a specialised step rather than a general task, so there is no need to check that.

Select a **ColorSync** profile to embed as it helps your computer, Application and printer display the same colour.

Lastly you can also just tell it to download everything automatically.

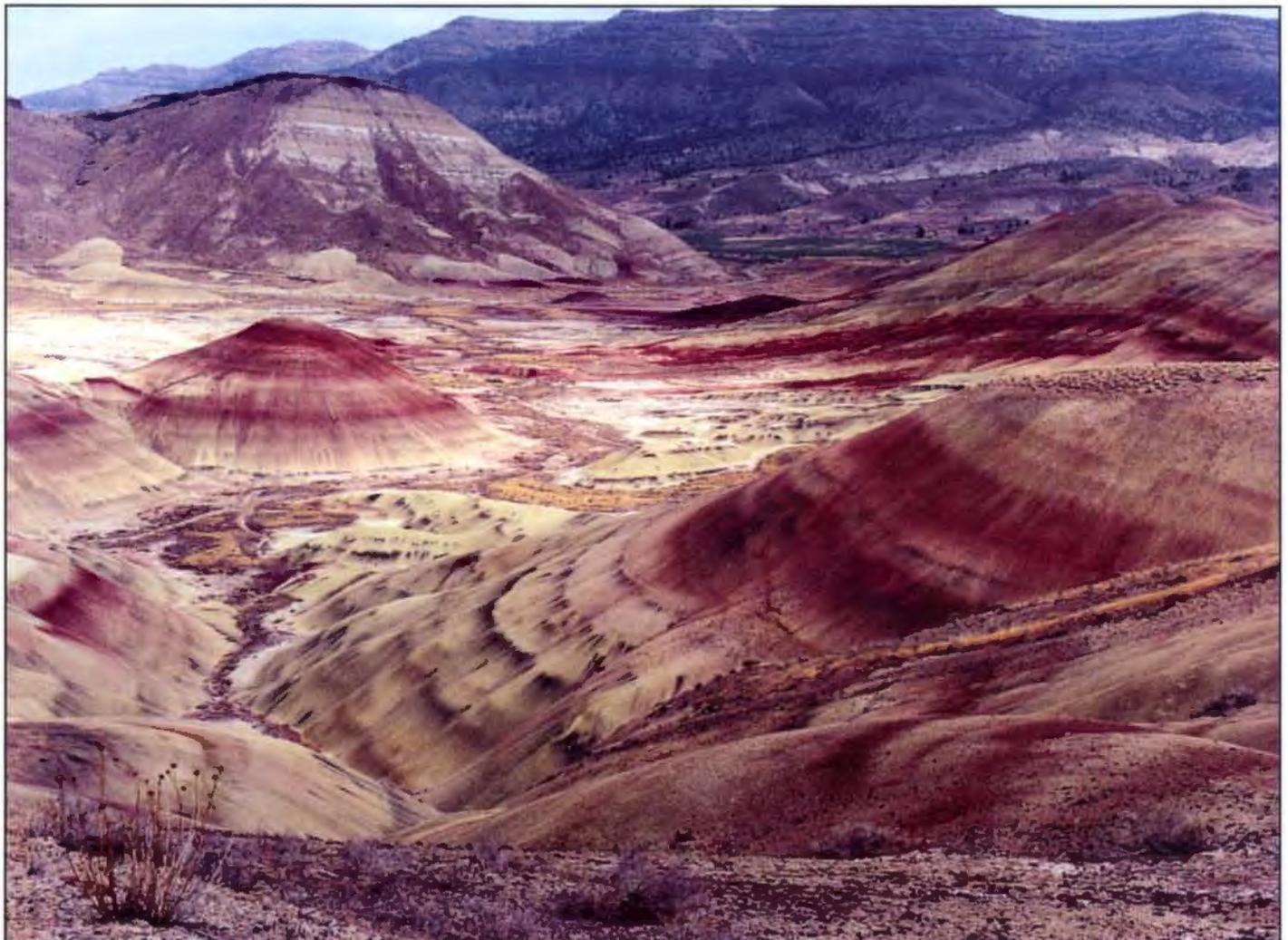
**Download Some & Download All** is self descriptive.

After you have made any other image downloads that you want, double click your Flash Card icon and drag all the images to the Trash, and then go to **FINDER>Empty trash** to clear your camera card. After deleting the images from your Flash Card, drag the Flash Card icon from the desktop into the Trash and disconnect the USB cable from the computer and replace the Flash Card in your camera.



Some Canon camera Flash Cards may not work using a Card Reader on a Mac. The Canon software writes the card in such a way that it will not activate Image Capture when connected. However all is not lost: simply connect the camera via its USB cable to the Mac and that will activate Image Capture as outlined above.

*Two of Tony's photos*  
**Right:**  
*Desert Varnish,*  
*Capitol Reef*  
*National Park*  
**Below:**  
*Painted Hills,*  
*John Day Fossil*  
*Beds, Oregon.*



# FOCUSFIXER V2

## SHRINKING THE CIRCLE OF CONFUSION

Good digital cameras are made to exacting standards and provide as near to perfect lenses and imagers as your budget will allow. This frees you, the photographer, to provide the art, the choice of subject and the way the camera is used, while the camera provides the photograph. There are, however, some things that money cannot buy. There are constraints on how a camera can be used: for example, the way the lens aperture governs image softness and depth of field are both due to the laws of physics. In this article Tim Atherton of FixerLabs looks at the recently launched FocusFixer V2 and explains how to squeeze more optical performance from your camera than the laws of physics may at first suggest is possible.



Figure 1: Canon 10D at f/6.3. John Gray ARPS



Figure 2: Hasselblad/Imacon 528c at f/27. Kurt Reynolds

Figure 3:

Left: a Lens PSF for Canon 10D and f/6.3

Right: b PSF due to anti-aliasing filter; and

Below: c Total PSF due to a and b combined.

Superimposed grid shows size of Canon 10D pixels (about 7µm).

Consider what happens when you take a digital photograph. The scene is imaged through a lens, passes through an optical anti-aliasing filter and is focussed on a sensor where the light intensity levels are sampled spatially (at pixels). Figures 1 and 2 show a couple of examples of digital photographs which we will be coming back to.

The illustrations below show two contributions to the overall circle of confusion from the lens and the anti-aliasing filter for a Canon 10D, with the same set up used to take Figure 1. The scales are in microns ( $\mu$  - millionths of a metre) and the grid shows the size of pixels on the sensor (about 7.4µm). The contributions from the lens Point Spread Function (PSF), Figure 3a, and the anti-aliasing filter, Figure 3b, add up, giving the result in Figure 3c. Technically, the two are blurred together, or convolved, to give the final blur.

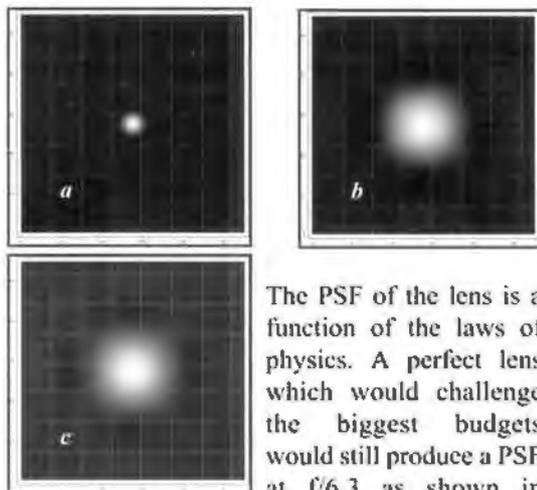


Figure 3a. Although the lens PSF is relatively small it will still cause light falling on one pixel to leak into neighbouring pixels. The anti-aliasing filter, Figure 3b, further blurs the image before it is sampled by the imager to ensure that

there are no components of the image that vary too rapidly. You cannot record, or for that matter display, variations faster than alternating pixels being light-dark-light-dark etc. Without the anti-aliasing filter Moiré effects and the 'jaggies' become apparent. We cannot change the pixel sampling of the imager (without changing the camera) so we need the anti-aliasing filter effect to remain intact.

FocusFixer V2 takes out the lens PSF and leaves the anti-aliasing untouched. It uses a technique known as deconvolution - quite unlike conventional sharpening techniques - and a very accurate model of the lens PSF to undo the softening of an out-of-focus or even an in-focus lens.

In this article we will focus on the in-focus case. The basic process of deconvolution is so different from Unsharp Masking (USM) that it is worth outlining. FocusFixer makes an initial guess at the result (which can be a flat grey image). It then blurs this with its model of the lens PSF and compares it with the original photograph. There will be errors and these are used to update the guess. It then repeats the process until the errors become so small that they effectively vanish. This computation is done in FocusFixer by a deconvolution engine operating on luminance, using double precision floating point arithmetic and some very sophisticated algorithms. The result is to subtract accurately the effects of the lens PSF from a digital photograph.

If you run FocusFixer V2 in Auto deblur mode it uses an even more sophisticated blind deconvolution engine to estimate the softening due to the lens PSF and then subtracts this blur out from the photograph using its deconvolution engine. The blind deconvolution used to estimate the lens blur is a significant technical step forward for digital photography - there is no

**SPECIAL DIGIT OFFER**  
FocusFixer V2 comes with the FixerBundle V2 suite of plug-ins for Adobe Photoshop (7, CS, CS2, CS3, CS4 on Windows XP and Vista, and CS3, CS4 on Mac OS X) priced at \$99.95 (about £75 + VAT at the time of writing). Use the code RPSDIGIT to get a 40% discount available until 31 May 2009.

deblur slider in auto mode: it automatically and accurately estimates and removes the lens blur. Auto-focus with a lens is one thing but this is auto-focus after the event, a process that transforms an in-focus lens and subtly changes some of the basic tenets of photography. The effect is as if a photograph had been taken with a much wider aperture than it actually was but without, as we shall see, the depth of field effects we would expect with a wider aperture.

Is FocusFixer V2 easy to use? Figure 4 below shows the control panel as it might appear in Photoshop.

You can drag the image in the previews, resize the previews and zoom in and out. You can use it in manual mode to set the deblur

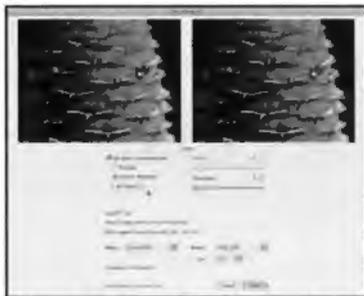
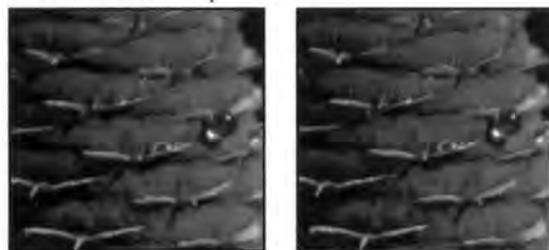


Figure 4. FocusFixer Control panel

with the slider or use one of two automatic modes to measure and set the deblur from the image. These use either the portion of the image in the Preview window or the entire photograph in Centre-weighted mode. Simply select Preview or Centre-weighted and press Set Deblur. The correct deblur value is calculated within about 10 seconds. If you like the result press OK and the photograph will be FocusFixed. Below is a before and after detail crop.



Delineation of fine detail in and around the water droplets revealed by FocusFixer is breathtaking. Centre-weighted mode is the most sophisticated and useful of the two auto modes. In this mode, FocusFixer V2 searches the entire photograph to find the most in-focus (least blurred) region and bases the deblur on that value. This prevents any over-sharpening by the deconvolution engine - you should not take out more lens blur than is present at any point in the photograph.

The Auto-deblur in FocusFixer V2 is the enabling technology for batch processing. With the deblur set to auto you can process a batch of photographs, pre-sharpening each to perfection.

To give you an idea of the way that f/number impacts on the circle of confusion I have another example from a Hasselblad/Imacon 528C. Figure 2 on the opposite page is certainly not short of pixels (the original had 22 Mega pixels) and was taken in bright California sunshine at f/27 and, as a result, has a large Depth of Field (DOF). The contributions to the overall circle of confusion are

shown in Figure 6: 6a shows the lens PSF, 6b the anti-aliasing filter and 6c the effect of combining these two to give the overall circle of confusion. With such a high f/number the contribution from the lens PSF is at least as significant as the anti-aliasing filter, if not more so.

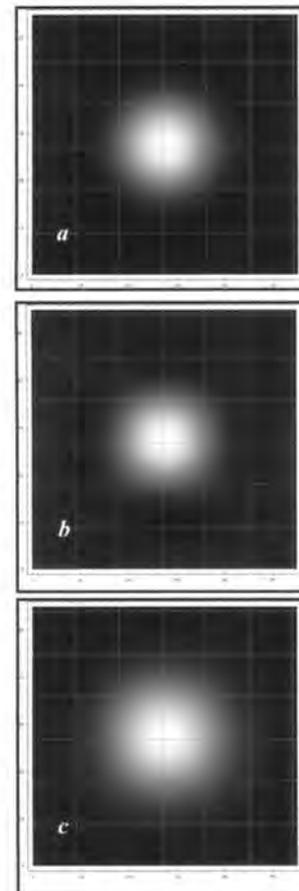
The result of applying FocusFixer V2 using the Centre-weighted Auto-deblur is shown, before and after overleaf in Figure 7. Although the tractor is hardly visible in the original photograph, at the scale reproduced on page 14, the difference that FocusFixer V2 makes to the result is significant. This difference is remarkable, especially considering the relative costs of FocusFixer V2 and the Hasselblad digital back, body and lens.

A consequence of subtracting out the in-focus softness is that FocusFixer V2 extends DOF. When focussed at a specific distance, objects have acceptable focus from some distance in front of the focal point to some distance beyond the focal point. The range of distances with acceptable focus increases with f/number. FocusFixer V2 will estimate the lens PSF at the most in-focus part of the image, which we can expect to be close to the focal point, and then subtract this blur from the entire photograph. Components of the scene that were just outside the DOF will be brought into acceptable focus. Just how far outside the DOF the effect applies will increase with f/number and is a matter for experimentation.

A special case of DOF effects is Hyperfocal Distance (HFD). HFD is the point of focus that gives acceptable focus from a point near to the photographer out to infinity. The near point is about half way to the HFD. The range of distances about the HFD is sometimes marked on the body of a lens - it always was in film days!

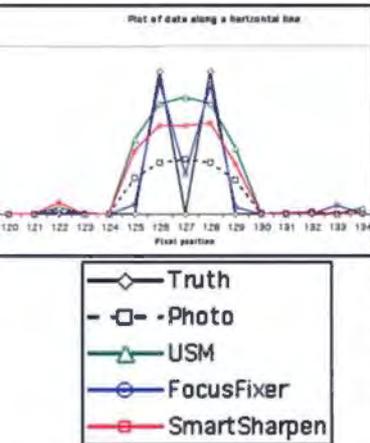
FocusFixer will estimate the lens PSF at or near to the HFD and subtract this blur from the entire photograph. Components of the scene just outside the near limit will be brought into the range of acceptable focus, bringing the near focus towards the camera. The comparisons overleaf (Figure 7) show some evidence of this in the shrubs on the distant hills and the foliage at the foot of the crop. FocusFixer also has another interesting effect on photographs. Light energy that should have been very localised leaks into neighbouring pixels because of the lens PSF. This reduces the resolution and also the contrast of fine details. The effect on resolving power can be seen if we consider two point light sources close to each other which would be resolved if there were no blurring effect from the lens: they would appear as two bright pixels separated by a single dark pixel. Figure 8 overleaf shows a luminance cross-section through a recorded image of two such points that are not resolved. The results of applying FocusFixer and other sharpening techniques are also shown. The original photograph consisted of a fuzzy blob, seen here in cross-section, and only FocusFixer has been able to resolve this to show the two sharp peaks.

Below: Figure 6  
a Lens PSF for Hasselblad/Imacon 528c and f/27  
b PSF component due to anti-aliasing filter, and  
c Total PSF due to a and b combined.  
Superimposed grid shows size of pixels (about 9µm).



Left: Figure 5.  
Detail of Canon 10D  
photograph before and after  
FocusFixer V2.

Tim Atherton started work in digital image processing in 1978 and built his first digital camera and computer interface in 1980. He worked as an academic computer scientist with research interests in image processing and high performance computing before founding FixerLabs in 2003 with the aim of transferring advanced technology from the research world into usable products for the photographic community.



We can also see in Figure 8 the increase in contrast generated by FocusFixer for fine details. FocusFixer has 'put the light back where it belongs'. The pixel at the centre of the two point sources has become darker and the two on either side brighter, as they should be. The total amount of light is the same before and after. Putting the light back where it belongs will make fine dark details darker and fine light details lighter.

What are the implications of using FocusFixer V2 in your workflow? First, FocusFixer builds a model of the Modulation Transfer Function (MTF) of the optical system and sensor. Anything that modifies this MTF should not be done to a digital photograph before FocusFixer is applied. Second, the histogram of a digital photograph should have some modest head room at both the light and dark ends. Clipping at black will potentially cause FocusFixer to attempt to drive dark fine detail below zero luminance: this is not desirable, or possible, and artifacts may result. Clipping at white is perhaps worse: the effects seem more visible. A digital image goes non-linear when it is clipped (at either black or white) breaking the model of ideal image formation used by FocusFixer.

To summarise the workflow guidelines: do not sharpen in-camera, in raw conversion, or any other way before FocusFixer (including the

Clarity slider in Adobe ACR) and ensure your photographs are taken with some small amount of headroom in the histogram at both light and dark ends. It is best to do anything that modifies the histogram after using FocusFixer. If you do have to use JPEG, save at the best quality possible.

In conclusion, in Auto-deblur mode, FocusFixer gives a photograph that has effectively been taken with a lens that introduces little or no softness at its in-focus point (irrespective of the f/number used); is correctly anti-aliased; and which has extended depth-of-field. The effect is like simultaneously using a wide aperture to give high resolution and a smaller aperture to give increased depth of field.

The effects of FocusFixer V2 are quite unlike sharpening techniques conventionally used in digital photography. The emphasis is on the accuracy of the deconvolution that undoes the laws of physics that a lens obeys. The results are digital photographs with increased delineation of fine detail - a more accurate representation of the scene in front of the camera and photographer.

For more information about FocusFixer V2 visit [www.fixerlabs.com](http://www.fixerlabs.com) where there is a special offer for *DIGIT* readers - see page 14..

*Above; Figure 8  
Cross-section through a photograph of two "stars" that are just resolved before the effects of lens blur are included and which become a single fuzzy blob when seen through the lens PSF. Results show effects of applying various sharpening techniques.*

*Below: Figure 7  
Hasselblad/Imacon photograph from page 14 a before, and b after FocusFixer V2.*



# WEBWISE 4 with David Cooke LRPS

All the *Webwise* material is on the DI Group website: <http://www.digit.rps.org/phpBB-3.0.1/phpBB3/>. You'll need to register on the Forum to make comments and to contribute. Click on the Register button on the top right of the main Forum screen. There's guidance on how to subscribe to podcasts using iTunes as well as the links given in the previous *Webwise* articles. When you look at them, please do make a comment on the Forum or email me at [d.f.cooke@open.ac.uk](mailto:d.f.cooke@open.ac.uk) to let me know how useful (or not) you found them. And please do recommend sites you've found interesting yourself so other members can share them.



Welcome to the fourth edition of *Webwise*. This time I've got recommendations for a browser toolbar, a podcast, and a web site, with the added bonus of podcasts and newsletters.

## StumbleUpon

<http://www.stumbleupon.com>

StumbleUpon is a great site for people who like discovering things by serendipity. It's a browser toolbar which allows you to discover 'random' sites on topics which interest you. Signing up is easy and free. As part of the signing up process you download the StumbleUpon toolbar. You can then choose the topics you are interested in depending on your interests and save these. You can change them at anytime. I chose 'photography'.

You use the site by clicking on the 'Stumble!' button on the left hand side of the toolbar and this will bring up a 'random' site in your chosen interests. If you like it, you click the 'I like it' button and this adds the site to your 'favorites' on the toolbar (note that this is not the same as the browser's 'favorites' or 'bookmarks'). You can then look at these later on by clicking on the 'favorites' button on the toolbar. When you do this, as well as the site you've saved, you'll see the number of reviews of this site by others. Clicking on this will give you information on the people who have marked it as one of their 'favorites' and the other sites they liked. There's lots more to the site than I've described above and advice on how to use it is given under the Tools dropdown menu.

It's a really good way of spending a few minutes of your time and discovering some very interesting sites. I've fallen over some really fascinating sites and images using it and I hope you do too.

## Digital Photography Tips from the Top Floor

<http://www.tipsfromthetopfloor.com> (or subscribe via iTunes)

Tips from the Top Floor is a very lively series of free podcasts about photography which has won a number of podcast awards over the last few years. It's

produced by photographer Chris Marquard, who says on the web site that:

"This show brings you non-techy tips that you can put to use immediately. It covers everything from image composition to post processing. No matter if you use a digital point-and-shoot or an expensive digital SLR. Tips for the beginner as well as the professional photographer." But, as the site also says "Tips from the Top Floor is not just a Podcast, it is also a wonderful community, it has a photo gallery, tips for Adobe Photoshop and a listener-managed knowledge library."

The podcast has a very 'young' feel to it so it may not appeal to everyone, but I enjoy listening to it very much and I've learned a lot. Try listening to an episode – if you like it then you'll get a lot from it. If you don't like the podcast there's still a lot on the website which might interest you.

## Magnum Photos Agency

<http://agency.magnumphotos.com/>

The Magnum Photos Agency website is fascinating and well worth exploring. You'll find information on the history of the Agency, a list of its photographers, past and present, together with portfolios for each one, essays, a blog, an events calendar, and, of course, lots of excellent images. There are also

## Podcasts

<http://inmotion.magnumphotos.com/podcast/podcast.xml> (or subscribe via iTunes, look for Magnum in motion in the iTunes store)

which are photo essays on a number of different subjects and

## Newsletters

<http://agency.magnumphotos.com/about/newsletters>

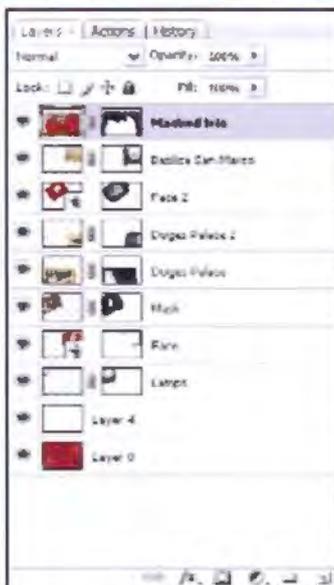
which you can subscribe to, free of charge.

There are nine newsletters available covering such topics as 'Photo of the week', 'Featured photographer' and 'Magnum workshops'.

Do have a look at the site, I'm sure you'll enjoy it and get a lot of inspiration from it.

# THE COOKE CHALLENGE

In the last issue of DIGIT (Winter 2008/09, Issue No 40), I invited members to send me their own images, together with a short description of how they created them. I'm really pleased to say that in this issue we have images from four members. If you find them interesting and helpful, why not join in and send me some of yours? Email me at: [d.f.cooke@open.ac.uk](mailto:d.f.cooke@open.ac.uk)



## Carnival Time, by Paula Davies FRPS

The idea for Carnival Time came about when I was playing with a kaleidoscope plug-in which I downloaded from the internet at <http://www.mehdplugins.com> I opened one of my images from a visit to the Venice Carnival in 2007 and ran the filter using the random button until I found what I thought would make an interesting background image. I decided that a picture of a group of three of the masked people would be the main subject of



The starting image. Filtered with kaleidoscope plug-in. Trio of carnival masks added

the final picture. These were placed in a new layer on top of my randomised background. A layer mask was used to erase any unwanted parts.

The picture was then built up using several layers. This was done by trial and error selecting parts of other images from Venice which I felt would help give an impression of Venice Carnival.

Firstly a new layer, filled with white at 20% opacity, was placed between the background layer and the masked trio layer. This was done to make the background layer less dominant and to help the trio stand out from the background. Various selections were made from other images and placed between the white layer and the masked trio layer. Each selection was made using the rectangular marquee tool without feathering as I prefer to use a layer mask and a large soft brush, at low opacity, to erase unwanted parts from each image. Brushing with black on the layer mask "erases" the unwanted parts. If a mistake is made brushing with white will bring it back.

In two instances I brought the original starting image into the picture and used "File > Place" which places the picture as a smart object which can easily be re-sized.

As each item was added I tried various blending modes and opacities until I found the one which I felt was most suitable to that layer. Blending modes used were Multiply for Lamps, Mask and Doges Palace; Screen for Face; Soft Light for Doges Palace 2 and Basilica San Marco and Normal for Face 2.



## Art in Saint Tropez by Dennis Stephenson ARPS

I was looking back at some previously rejected images and thought I could do something with this one. I also keep a folder called 'Figures' in which I keep extracted shots of people to insert into pictures. The trouble with this is that when I do, the judge says it was not necessary and when I don't the image could do with a figure!

The original shot was quite severely cropped and the usual PS adjustments applied. I did use a blue to light blue gradient on the sky. A 5 pixel border was added with a darker blue. The canvas size was increased in white to accommodate the figures. The girl was nearly as taken but I did change the trousers and hat on the old gent to blue and whitened up the jacket.

The two figures were dragged on to the canvas each on a separate layer of course and each layer was duplicated. Both duplicated layers were converted to black, the opacity reduced to about 30% and merged with the original layers, giving the shadows. The shadows were positioned in the correct place to correspond with the lighting on the background original. It was then possible to drag the two figures around to get the best position with part of each out of frame - a feature that I like to do. The part of the shadows on the background was erased on each of the duplicated layers to complete the image.



### Welford Road Cemetery, Leicester by Dr Ria Cooke LRPS

I wanted to capture the beauty of this historic cemetery in the snow by applying manipulations to give it an appearance reminiscent of an etching. I began by opening my RAW image in Adobe Photoshop through Camera Raw. I applied a Silver Efex Pro (Nik software plugin for Photoshop) filter: I used antique solarisation, reducing the brightness to -30, contrast to -100 and the structure to 50 to largely remove the inverted effect and enhance the detail of the image. I also protected the highlights 100% to preserve the detail in the sky. This filter was applied as a layer with opacity of 75% so that some of the colour and detail of the original image showed through, giving depth to the effect. I increased the size of the canvas to add the white border, and then applied a number of additional layers, using the cloning tool and the brush with a diffuse edge in white to soften the edges. Finally, I copied the filter and made it lighter and darker, and painted in areas of each of these to soften the left and right bleached areas and to balance the grey borders at the top and bottom.



### Teasels by Peter Keverne ARPS

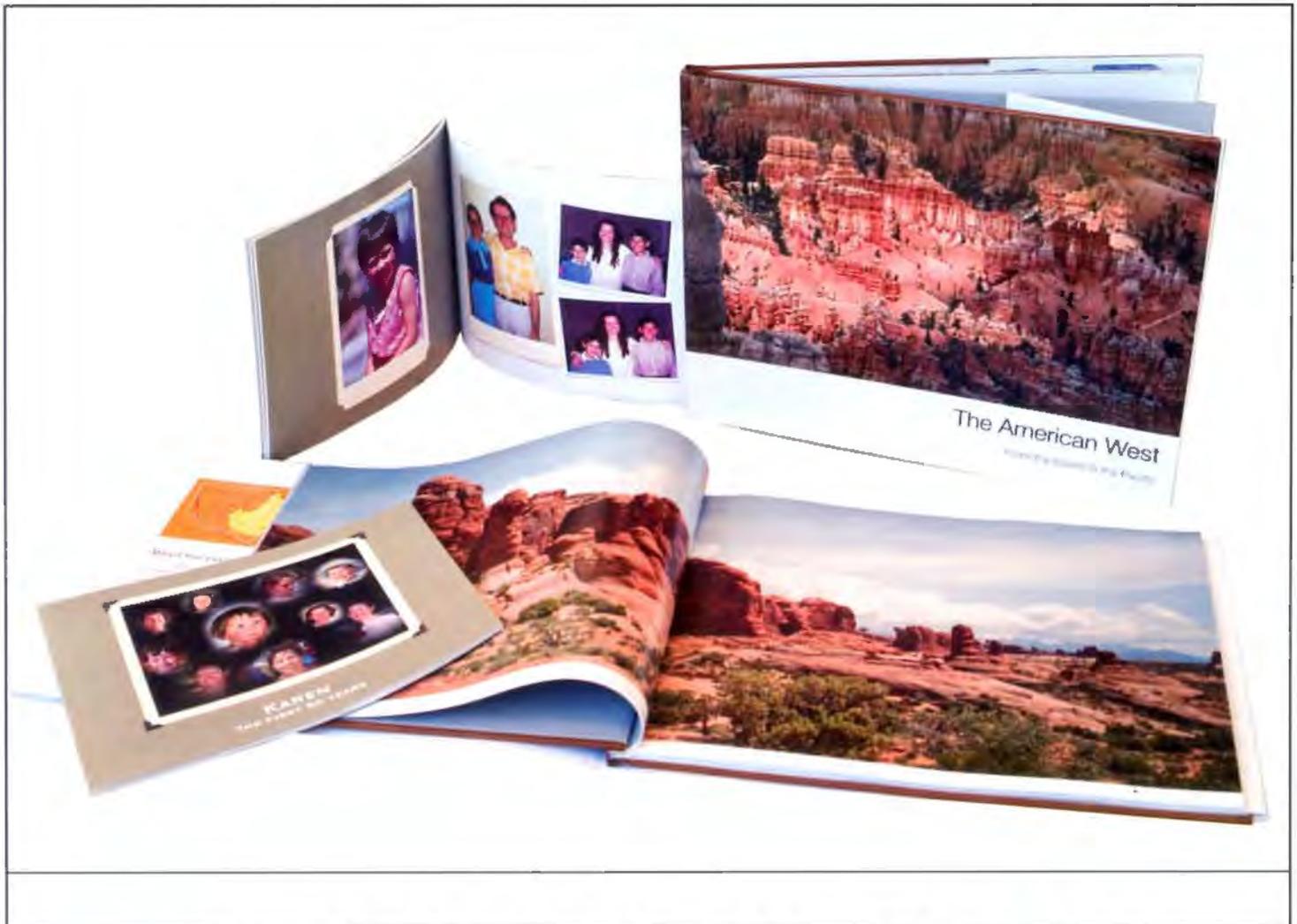
'Abstracts' have interested me for probably more than fifty years now. I do not have any deep philosophical reasoning for this interest other than really good ones give my eyes a creative buzz. I can only think it must be something to do with the way I see and react to colour. Strangely though, it was on introduction to digital photography by an artist that I immediately saw the possibilities of creating successful abstracts compared to my feeble efforts with the paintbrush.

At present I use Photoshop CS3 with a plethora of add on plug-ins. My example is a fairly simple one of back lit teasels taken in-situ using a Sony A 700 and a Sony 100 mm macro lens. I could see that the shot had potential for abstraction, and if not, certainly manipulation, and ideal for my Redfield plug-in Fractalius.

So open your file in Photoshop and select the Fractalius plug-in. When using it for the first time, it opens in the default setting, on further use it opens in the 'Last used Setting'. From this point it is up to you, there are 14 different presets some converting to monochrome. You can just accept these presets as they are or modify them using the Random Settings Generator. These can be further modified manually by adjusting two sets of four sliders controlling Sharpness, Line Width, Radius and Diffusion. Two further sliders control Brightness and Saturation, with a final filter adjusting the scale of the effect. The effects are almost limitless. Fortunately when you get an effect that pleases you, you can save this as your own pre-set but this will not necessarily give you the exact effect when applied to a different picture. Have fun!

There are numerous examples on <http://www.redfield.com/fractalius> and <http://www.redbubble.com/groups/extraordinary-fractalius>





## PHOTO BOOKS WITH MAC® iPHOTO

**What's happening to the family album? Tony Healy, former Kodak staff member, says that with the huge conversion of the general public from film to digital cameras there needed to be a change of thinking about the traditional family album by photo finishers who wanted to stay in business. Those DI Group members who use a Mac computer should know that Apple had been thinking about it too and have provided a Photo Book service through their standard Mac OS application iPhoto. Here Tony takes us through the elements of design in the preparation of a Photo Book.**

**W**hen you open iPhoto there are three icons at the bottom of the page called Book, Calendar and Cards. Clicking on any one of these will allow you to produce your own personal copy of the chosen item.

iPhoto is a fairly intuitive application but should you want an in-depth book on the subject you can buy a hard copy manual or download a PDF version at:

[www.takecontrolbooks.com/iphoto7-vqs.html](http://www.takecontrolbooks.com/iphoto7-vqs.html)

Using the Photo Book feature is a fairly simple process with a demonstration at [www.apple.com/findouthow/photos/#tab](http://www.apple.com/findouthow/photos/#tab).

For full information on these products go to: [www.apple.com/ilife/iphoto/print-products.html](http://www.apple.com/ilife/iphoto/print-products.html) I would recommend you view these web sites before starting to compile your book.

The Photo Books are available in hard cover, soft cover and wire bound with large, medium and small sizes. You are offered a range of styles and you can select from thirteen Apple-designed book

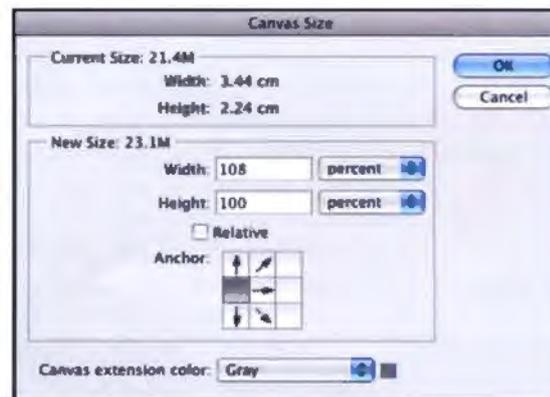
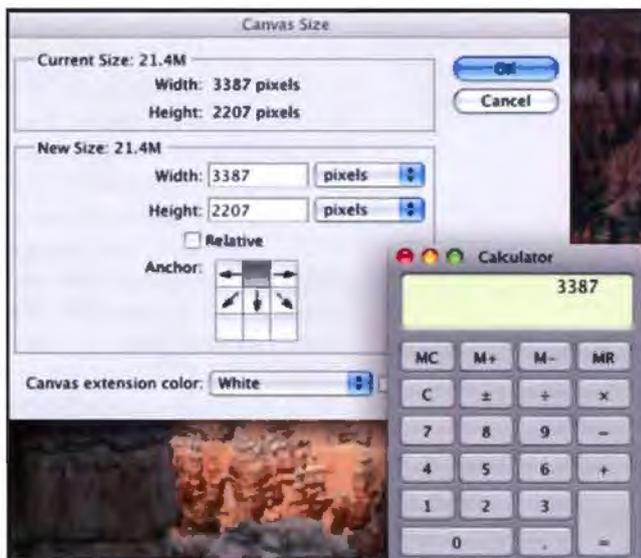
themes with multiple page-designed options. The default book size is 20 pages but you can add up to 100 pages if you wish. Of course the price increases as you make more pages. The web sites mentioned above demonstrate the general process so I won't repeat that here. All this makes it a very simple matter to create your own book but if you are like me you may want to push the boundaries a bit.

Although not obvious there are some limits to the creation process. All the templates are for a 3:4 ratio. Not a real problem as most digital camera use this ratio but a problem if, like me, you want to use your old 35mm slides and negatives which have a 2:3 ratio. Some of them may take a crop OK but what of those carefully composed images of which you are very proud? Most photographers will probably opt for the hard cover Picture, Formal or Contemporary themed books and in the case of the large, hard cover book this contains a binding process that crops 10 mm off the picture. So what to do?

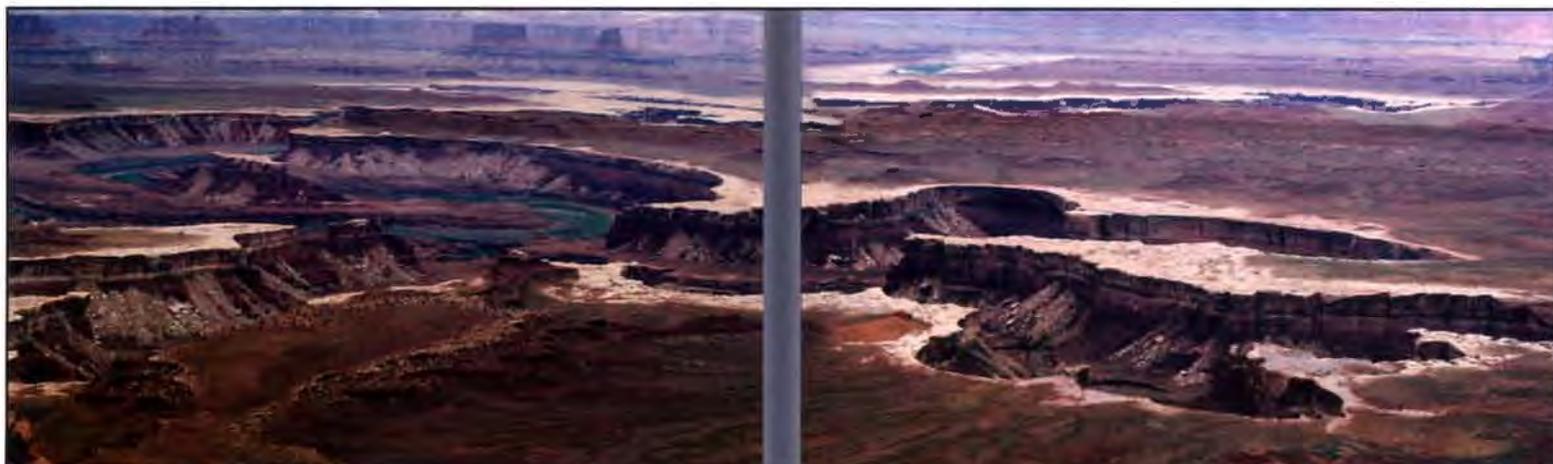
Well, in my case, I wanted to use slides and negatives and current digital images from my camera that captures in the 2:3 ratio format so I decided to see how far I could push the limits. Firstly, if an image ratio other than 3:4 is dragged into the template it can be moved around to select the composition that you want. If you select a template that includes a caption make sure there is no loss of a portion of the image due



to the caption space. To keep the full 2:3 image I went into Photoshop and selected Image > Canvas size, changed the units to pixels and divided the longer side by 4 and multiplied the answer by 3. I then changed the short side of the image to this figure and filled it with White. There is an option of white or black coloured background so the choice of white makes it blend with the rest of the page unless you have chosen a black background. Where I wanted a whole page image or a two page panoramic picture the approach was a bit different. It is necessary to allow for the 10mm loss when choosing the hard cover book with a full page image. This is not a case of just adding 10mm to your picture because the printed image size is linked to the file resolution. There probably are maths to work this out but maths is not my forte! I found that adding 8% to the side which will be adjacent to the book spine seemed to work. Once again this is done in Photoshop, selecting Image > Canvas size - see below.



I filled this extra with 50% grey just to make it stand out from the rest of the image. This is done BEFORE calculating the 3:4 ratio outlined above as it has to be part of the 3:4 image as shown in the panorama below.



The confluence of the Colorado and Green Rivers in the valleys below has created the local name for these viewing areas as Island in the Sky.

The light areas in the picture are part of the White Rim sandstone layer which runs through the Park.

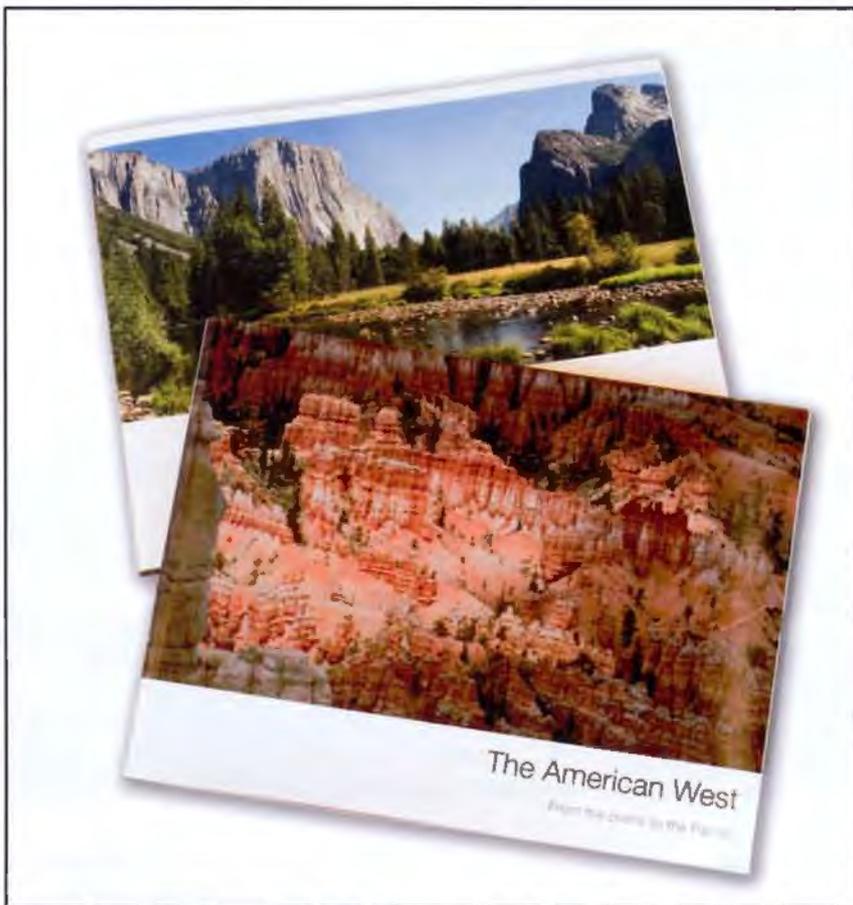


The images that you want to use in your book don't have to be located in iPhoto. Once you've clicked on the Book icon and given the book a title, it will create a new icon on the left side of the screen. It is only a matter of dragging images from any other location onto the icon and they will be imported into that book set. There is no need to finish the book in one sitting. In fact after you have created your book icon if you decide to do something else you can close iPhoto and come back at a later time to take up where you left off.

You can use a number of file formats in creating the book but converting the images to jpegs will help to keep the total book file small. The book is transmitted electronically so the smaller the better.

I have made a two volume book set of The American West from a trip in 1992, compiled from slides and negatives of that holiday. The books had 50 and 78 pages respectively as seen on the left below.

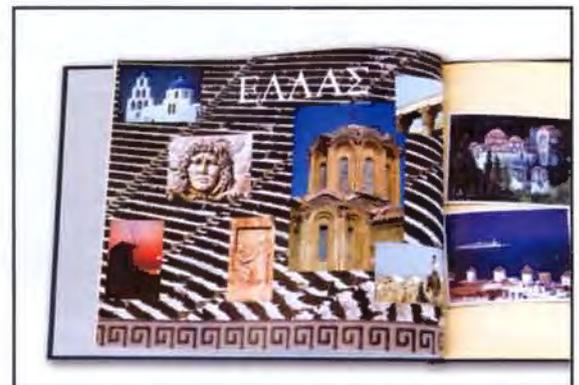
After completing your book and clicking on Buy Book you are given the choice of a brown or black cover. I also did a small softcover book for my daughter's birthday which is shown here as well as an early test of the process using the Travel theme



book. In the example shown below I replaced the extra canvas needed for a 3:4 ratio with a Greek freize. By the way, the font used for the Greek letters ELLAS is SYMBOL and can be accessed from the drop down Character Palette under the flag icon on the menu along the top of the window.

With the Leopard operating system, iPhoto will now provide maps for you to place in your book as well as record the locations in iPhoto of where they were taken. If you have a camera that records GPS data it is just a case of clicking the edge of the photo to get the map.

For more detailed information look at the tutorial at: <http://www.apple.com/ilife/iphoto/#places>



# LOST DATA FROM YOUR COMPUTER OR MEMORY CARD?

Fear not says Timothy Ayers of Palmer Data Recovery.

**D**o manufacturers of computer hard disk drives and other digital media spend billions of pounds a year to make bigger and bigger media capacities to meet our ever growing needs? Or do we simply find more data to fill the ever growing capacity of digital storage formats? Either way, if we are dependent on the data stored on a hard disk drive for a living, or just to live our modern lives, what would happen if it failed?

Computer hard drives have come a long way since they were first conceived by IBM back in 1956. However, with all of their advances, they are all based on the same principle which I will now briefly explain. If you have ever handled an everyday hard disk drive, be it any of the physical sizes from 3" down to 1" across, you will probably have noticed the printed circuit board (PCB) on the bottom. The purpose of the PCB is to interface with the host computer and control everything that goes on inside the hard drive.

Internally, there will be a number of rotating disks, known as platters that spin at up to 15,000 rpm. In modern hard drives, there are commonly up to 5 stacked disks, spaced a few millimetres apart allowing access to both faces of the platter. The platters are made of either glass or an aluminium alloy and coated with a cobalt oxide. The platters are perfectly balanced and the surface is incredibly smooth, so much so that they are mirror like to look at. All of your much loved data is stored by magnetically polarising the surface of the platters by applying a localised magnetic field close to the surface creating a sequence of north and south poles to represent the data being stored. The components that read and write are called the heads. They are small ceramic blocks (roughly ½mm wide x 1mm long) with a tiny wire coil at the end which creates the magnetic field to write the data. To minimise friction between the heads and the surface of the platters, the heads fly a few thousandths of a millimetre above the surface on a thin cushion of air created by the spinning platters. The heads are mounted on the tip of an arm that accurately moves the heads across the platter using a magnetic actuator.

If any one of the components that makes up a hard disk drive fails, the hard drive will stop working and depending on what has failed will dictate how much work is required to get the data back. As a data recovery engineer, my job is not to repair the hard drive to a perfect working state so that the user can have their hard drive back good as new; my aim is to fix the hard drive long enough to take an image - an exact digital copy of the original

*Compact Flash card* hard drive or other piece of media. It is from the image that we will then recover individual files. Imaging a hard drive or other media format is the best method of preserving the data if the media is not working well. This is because the specialist software used is more gentle with the media and less damaging to the internal components than trying to boot the computer as normal.

Fixing a hard drive can involve hours of work and sometimes there is nothing that can be done to recover the data. For example, a hard drive



*Computer hard drive*

that has a failure commonly referred to as a head crash is seldom recoverable. As the name suggests, head crashes happen when the heads no longer fly above the platter surface but crash into the platter, scratching away the surface and your data. But head crashes account for only 10% of the failures that we see on a daily basis; most of the work that we do involves swapping components in our cleanroom facility.

*Palmer's Clean Room*



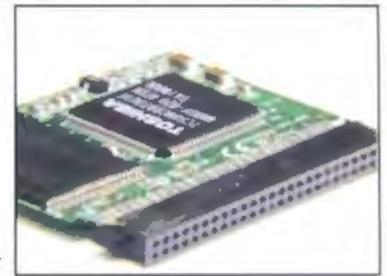
*Hard drive heads*



Hard drives can be very sensitive to static electricity and dust, which is why it is not recommended to open a hard drive in a normal workshop or office. They should be worked on by a professional.

That's enough about your computer's hard drive, what happens when the memory card in your digital camera fails? In 99% of cases the pictures are still there, you just cannot access them. The problem is commonly one of two categories of failures, physical or logical.

In the case of a physical failure, you would normally get an error that there is a problem with the card. This is because the computer ▶ page 25



# PATHWAYS

Life is funny, says Carol Wiles, you never know what may happen next. Ever since she can remember, people have been asking if she was a teacher. Perhaps they knew something she didn't since she's now rather surprised to find herself running digital photography workshops.



*Above: Modern Girl  
Norman Wiles LRPS*

**M**y photography started when I was 12 years old when my parents bought me a Kodak Box Brownie, and I took black and white images, mostly of my holidays and family occasions. I've had no training as a teacher - in fact (to the chagrin of my Headmistress) I took an Ordinary National Diploma in Business Studies, which included shorthand and typing, and spent my pre-marriage years doing secretarial things. But let's move on to the present.

A couple of years ago, in response to questions from camera club members which showed a distinct lack of knowledge of computers and photographic software, my husband Norman suggested that we run a few workshops to help people out.

I thought it would be a good idea. We'd given friends one-to-one help with editing, scanning transparencies, and general photography for several years but now more and more questions involved digital problems. Norman is very good with cameras; I find the computer a challenge. So, together with a friend from our camera club who

*Below: Protea Bird  
Carol Wiles ARPS*



is good at demonstrating and the intricacies of the technology we decided to give it a whirl.

We rented a room for four workshops - as a trial. If it didn't work out, we could just forget it! All we had to cover was the cost of the rent of the room, and a cup of tea for whoever turned up. After an initial surge of interest, we felt we may experience drop-off.

We opened the first session with: 'These workshops are for you. We want you to ask questions, and if there are none, we'll all be down the pub in ten minutes!' The rest, as they say, is history. We have never experienced a drop in numbers of people attending: as soon as people decide not to come any longer, new ones turn up. After a short while, we decided to run the workshops and courses under the auspices of our camera club at Wimborne, but with attendance open to non-club members as well. We have really put the equipment we purchased with the Awards for All (lottery-aided) Grant to good use.

With over thirty workshops, two 6-week courses for Beginners in Digital Photography, and two five-week courses for Photoshop Back to Basics under our belts, we know that these events are an essential part of photography these days. We also know that there are many other workshops now being held all over the country by all sorts of different groups of people and individuals and that there is a big demand for knowledge.

The many tutorials on the Web and books on digital photography, from the basics to in-depth tomes, together with the massive increase in the number of people owning digital cameras (including mobile phones) gives an indication of the huge interest there is in the new-found pleasures of digital photography.

Ever since the inaugural workshop, I have been the one to take the notes, something that I love doing and find easy, although I no longer use shorthand. This enables the members to sit up and take notice, instead of trying to scribble in the dark, and possibly miss an all-important step in a method being described.

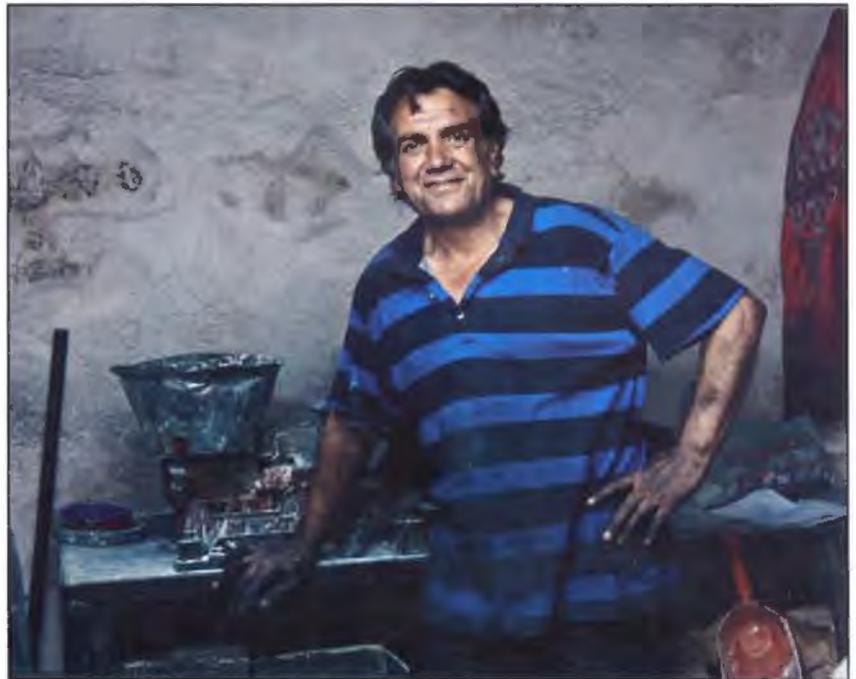
After the meetings, I type up the notes, working through the methods with the software to make sure they make sense, and then I email them to all the attendees. This method of communication is so easy it is a dream, and everyone is very complimentary and appreciative too. Out of a

Curves and correcting colour casts, to much more in-depth subjects like using pseudo Infrared and Blending Modes. And we also cover making audio-visual sequences using ProShow software, and Audacity.

We have had sessions to look at prints, and address printing problems, and for viewing our digital images and finding ways to improve composition and technique. We always encourage our attendees to take part, and have had several



*Left: The Watching Door by Carol; right: Mechanic by Norman*



demos as well as welcoming visiting speakers. We run the workshops twice a month from September to April, one a month during the summer, and the courses as and when we have enough people interested to warrant one. As there are three of us, we can cover holidays and absences. We also have standby people in reserve. I really can't see an end to it all in the foreseeable future. Photography is my pathway and is such a wonderful hobby.

from page 234 or camera cannot access the memory card properly and an error is reported. Although the camera cannot access anything on the card, the flash memory chips still hold the data: but typically the circuit board and electronics that talk to the chips has become damaged. To fix this problem, a data recovery specialist would remove the memory chips from the board and place them into a 'chip reader' - which as the name suggests, reads the chips! However, the data that is read from the chips will not be in a usable format and some work is required to return the data to its former state.

For logical failures, sometime referred to as corruption, the memory card works perfectly and you will not receive any errors from the camera, but the pictures that were taken no longer appear to be there. In the majority of cases, the card has lost some information about what is stored on its memory and therefore thinks that it is blank. A good analogy would be pouring a cup of tea over the index page of your favourite text book: all of the chapters of the book are still there, but you don't know where to look to find them. Using specialist software, a data recovery specialist can search through the memory card for what is recognised as being a picture and rebuild the 'index page' and regains access to the data.

So how do you prevent data loss from your computer or memory card? Firstly, try not to drop your memory card in the bath, feed it to the dog or

slam it in the car door - all genuine situations that we have come across.

If you suspect that there is a logical or physical problem, or you have accidentally deleted something, stop using the computer or memory card immediately and send it to a data recovery specialist. Testing it yourself is likely to make the problem worse if you are not confident about what you are doing.

Remember that your computer's hard drive is a mechanical device and doesn't take kindly to being knocked about, especially while it's running, so keep your PC away the edge of the desk.

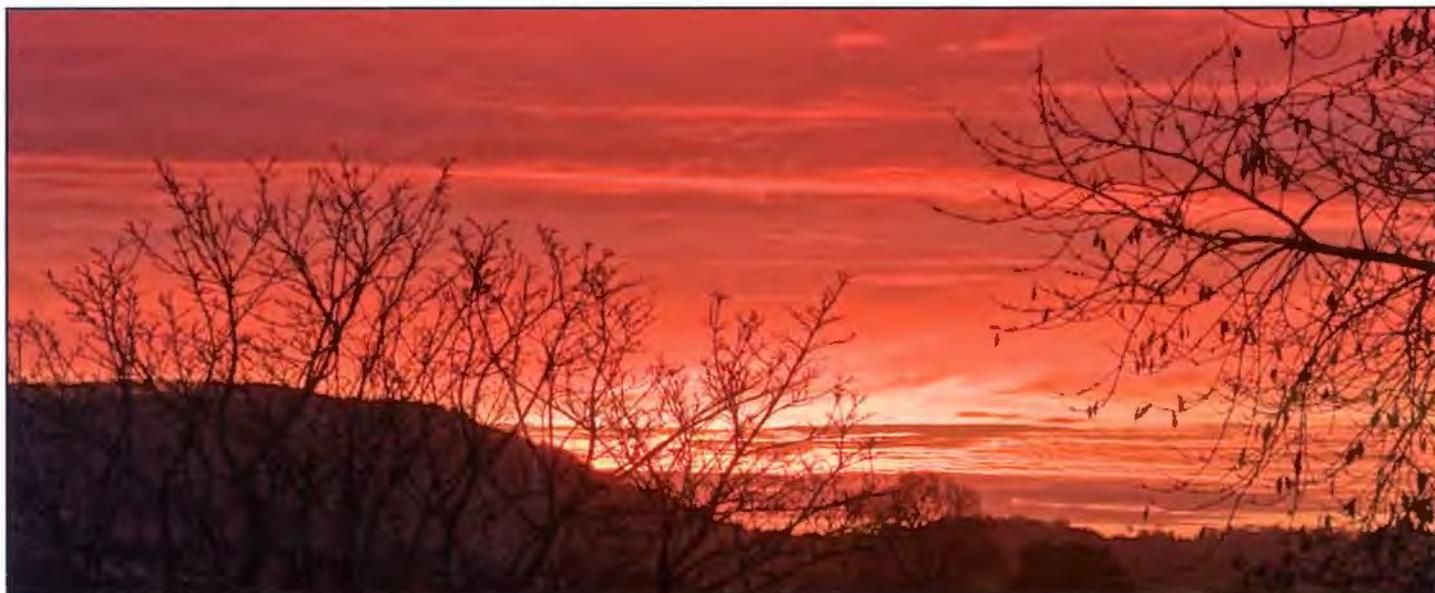
All electro-mechanical devices have a limited shelf life; about 3 - 5 years for a hard drive and 10,000 - 500,000 write/erase cycles for a memory card. It wouldn't hurt to get them replaced when the time comes.

Corruption in memory cards often occurs when a camera has not finished writing data to the card so never remove the card while the camera is turned on and try not to let the batteries die half way through a shoot.

Regularly back up your computer's data onto an external hard drive - good quality portable 160GB backup drives cost as little as £60. Remember that backup hard drives are meant to be a backup and are no more reliable than your computer's own internal hard drive so always make sure you have at least two copies of your favourite work on two different hard drives.

**To speak to a Data Recovery Consultant for immediate advice and guidance (24/7) call Palmer on:**

**+44 (0)208 247 0333; or e-mail from the website: [www.palmerdata.com](http://www.palmerdata.com)**



*Dawn panorama; a cropped view to create a specific mood. (13 Nov 08; Leica Digilux 2)*

## A VIEW FROM MY WINDOW

**David Askham lives in rural Wiltshire, where he can see magnificent dawn skies from his bedroom window. He has made a personal project out of photographing these and, here, he explains the benefits of projects in photography and how he goes about capturing and processing his images.**

Imagine waking up and being dazzled by a stunning dawn sky. It does happen although it is difficult to imagine such a spectacular scene when a sequence of grey foggy wintry days kills any hope of fruitful photography. However, those occasional colourful gems of nature show what picture possibilities exist right on our metaphorical doorsteps or, more accurately, outside my bedroom window.

I live in rural Wiltshire, an under-rated less well-known but lovely county. Our main bedroom faces towards the east which is ideal for glimpsing nature's rare early morning fiery displays. Better still, I have an uninterrupted view towards the western edge of the North Wessex Downs. It is Crown land which offers a measure of immunity from encroaching housing development. It is a view I cherish and never take for granted. Hence it is no surprise that, over the years, I have been stirred to capture some of the early morning vistas and dawn skies, almost from the comfort of my bed!

Several of these pictures have aroused interest when I posted them on the DI Group website; that is why I was invited to write about a small personal photo project for DIGIT magazine. My only reservation is that my photography is mainly for illustrative purposes and I feel silently inadequate when I see such wonderful digital manipulations in these pages and on the website. Perhaps I can make amends by focusing readers' attention on the importance of pursuing personal projects with a theme.

### **Pick a project or two**

One of the best ways of overcoming the photographer's equivalent of 'writer's block' is to list a few possible new personal projects. They can be open-ended, like my dawn skies, or short-term where you are keen to achieve something tangible fairly quickly. It is best to face a new challenge, so try to avoid subjects and techniques which are well within your comfort zone. In summertime that means getting out of bed rather earlier than scheduled!

Thus far, my dawn skies project has largely been limited to straight capture. Despite the often early hour for creative photography, I have to contend with shooting through a large top-hinged double-glazed window. It does open, but provides only a limited gap at the base. Actually the perspective is better higher up the window. By setting the focus on infinity I minimize the effect of the double window glass. I have found, however, that because windows lack optical purity, image quality varies. So I try different positions on the glass and assess the results.

Stunning dawns are largely unpredictable. So to avoid being caught out, I keep a long obsolete Pentax Optio 555 digital compact in my bedside drawer so that there is no delay should I be tempted to shoot the transient effects before I am ready to receive visitors. I have been able to capture a hungry fox looking for scraps in the garden with this little camera. Given time and something spectacular to shoot, I dash for my better kit. Captions show more details.

Dawn skies are remarkably transient phenomena.



*Sunrise over Devizes; (24 Nov 07; Pentax K10D)*

The most dramatic skies occur before actual sunrise. So skill is needed in anticipating the best moments. I find that a cloudless sky is the more disappointing and generally a waste of time to photograph. Sometimes I am lucky and find high alto-cumulus clouds which light up pre-dawn presenting an ever-changing picture which fills the sky. Mackerel skies are very photogenic. But any light clouds are welcome and maximise the appeal of a colourful dawn sky.

My sunrise positions change from almost out of view to the south in winter to the extreme north-east in summer. Also my horizon follows the changing contours of the Downs, site of the famous Civil War battlefield – the Battle of Roundway. Some of the locals claim that one of the gullies visible from my home is called 'Bloody Gulch'! Certainly cannon balls have been found locally and our nearest pub is called the 'Oliver Cromwell'.

I have found that my greatest opportunities arise in mid-winter where the air temperatures are at their lowest. Another factor in their favour is that they occur at more socially acceptable times. In summer the sun rises very early, long before most mortals stir from their beds. Perhaps that accounts for my preference for winter dawn pictures.

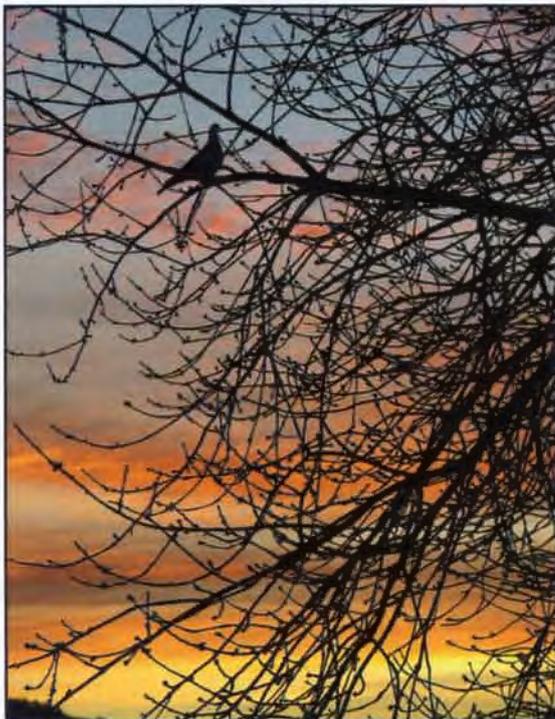
A rare bonus is the arrival of hoar frost or snow which adds light to otherwise deeply shaded valleys and foreground. It doesn't happen often, but the recent winter has excelled. Even November mists add an element of mystery.



*Rich dawn hues; a deliberately more saturated interpretation to accentuate the drama of a dawn sky in winter. (26 Jan 08; Pentax K10D)*



*North Wessex Downs at dawn with cherry tree; (26 Dec 07; Leica Digilux 2)*



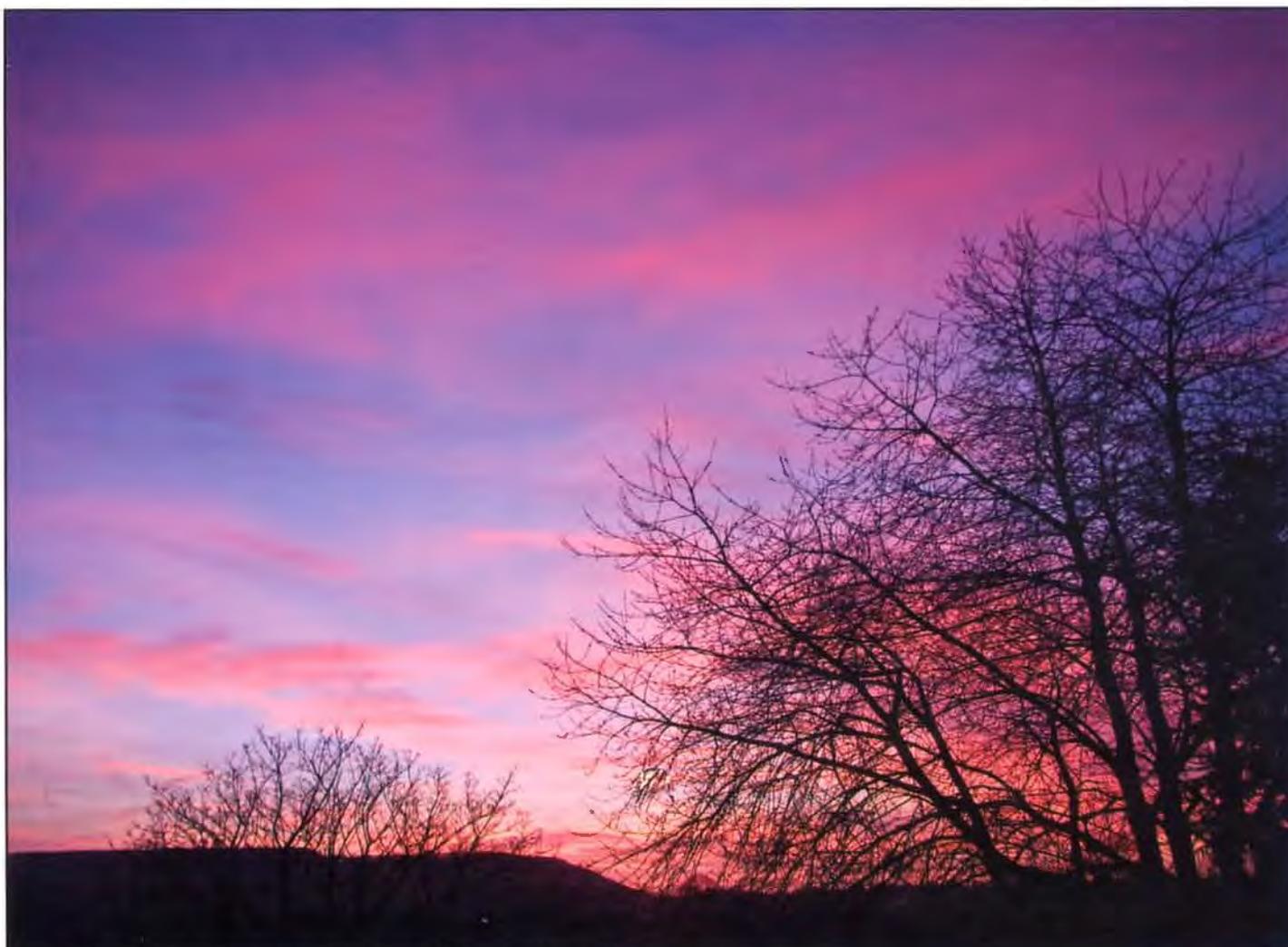
*Wood pigeon in cherry tree; a change in focus to feature a tangled naked tree. (22 Jan 08; Pentax Optio 555)*

Over the years my bedroom window view has varied as farming methods have changed. Also, two young trees in our garden, one a wild cherry (*prunus avium*) and the other a maple, both planted before we arrived, have grown considerably and, when in leaf, obscure much of what can be seen in winter. While the birds of many species revel in their canopies, they are beginning to intrude into my seasonal pictures. We are reluctant to mutilate or remove them so it is I who has to adapt.

#### **Digital post-processing**

Like many photographers who have many more years of experience with film cameras my gradual, but as yet incomplete switch to digital, was driven more by the ability to assess my progress in a timelier manner. Waiting for films to be processed has its own advantages and was well suited to the slower pace of life. Whereas the relative ease, economy and speed of digital delivery is a clear advantage to clients or friends.

Normally I do very little manipulation of my digital images unless preparing them for publication. All



*Classic dawn colour with realistic pink hue; (25 Jan 08; Leica Digilux 2)*

new files are imported into Adobe Lightroom (now version 2.2) where batch white balancing is carried out. Dawn skies are shot without a reference because their magic would be lost if colour temperatures were neutralized. But in most other work, I shoot a reference WhiteBalance image for each sequence taken under identical lighting conditions. That method is not foolproof but it gets me extremely close to an acceptable balance. Wherever possible, I capture raw files.

The next step is a quick judgment on which pictures are the 'keepers' and which should be deleted. Each 'keeper' is flagged accordingly so that obvious rejects can be batch selected and removed from my hard disk. The rest are then re-examined and compared until the next set of rejects is removed. Often this process entails close scrutiny at 100% in order to decide which of two rivals has the edge on sharpness or composition. I try to be ruthless in this process; otherwise the computer quickly fills with low-value material. I try to schedule winter evenings to weed out material which no longer justifies retention; but I have to know when to stop before

tiredness impairs my judgement. Finally, all keepers are backed up to an external hard drive.

Keywording is my next crucial stage. I try to include all relevant keywords which will enable me to find required pictures quickly in the future. Despite keywording being a necessary chore, it is easy to get carried away and include far too many words. I try to be realistic about what is truly relevant.

When I was searching for "dawn" to illustrate this article, 99 retained pictures were very quickly filtered into view for my consideration. Imagine trying to trawl through over 25,000 digital files to find those images which could be buried in historical folders or external media!

Well I have described how a simple local interest has continued to grow over the years. Shooting dawn pictures is but one example of how important and easy it is to inject freshness into one's photography. If you hit the doldrums one day, why not pick a simple project and see what a difference it can make to your photography.

Lest you think that I might have exhausted my location – sorry, but my view is not yet for sale!



## A CANVAS COLLAGE WITH PHOTOSHOP AND COREL PAINTER

**Gitta Lim is a regular contributor to the DI Group Folio and Forum and her creative images are always exciting. In this article her digital imaging talents and her artists' materials are brought into play as she shows us how to make a collage.**

This is an easy and simple way to create a cut and paste collage from your hobby items or whatever you wish to include in your collage. I have never managed to paint well with oils or watercolours but decided to use photos of my painting tools for a collage. I took separate shots of a flower, brushes, pallet knife and painter's pallet for this collage and tried to keep the light source and angle as similar as possible at the time of shooting.

I first created a new file in File/New in Photoshop and added some random colour strokes with the Brush Tool on the page. I applied a heavy Gaussian Blur filter to blur it all in Filter/Blur/Gaussian Blur. This formed the background for my collage.

*Below: The pallet*



But you can also use another image file for the background. As a size guide for creating a new file using your digital camera, using your camera file pixels and precise resolution should work well. Whatever you cut and paste from other images, aim to downsize them rather than upsize to keep the image quality good and sharp. It also helps to sharpen all your images before creating cut-out selections.

For this image I needed to add some paint blobs on my painter's pallet image. It was easier to do it in Corel Painter than squeezing paint out of real oil tubes. I opened the painter's pallet image file in Corel Painter and added brush strokes with thick oil brushes to create 3D-like stroke effects as shown on the left. Hundreds of brushes are

available in Painter so experimenting with effects helps to find suitable ones. Although I preferred to use Corel Painter similar brushes and effects can be found in Photoshop.

Next in Photoshop I opened the painter's pallet image I had edited in Corel Painter and created a selection around the pallet edges with the Pen Tool. I used very light feathering to soften the selection's edges by choosing Select/Modify/Feather with 1 pixel.

To copy the selected cut-out onto a new layer go to Layer/New. The shortcut keys are Ctrl+J in Windows, CMD+J in Mac. Next I dragged this new layer on top of my main background image and resized it to fit using Edit/Transform/Scale. Only use the corner guides for resizing, making sure you hold down the Shift key while downsizing to keep the image proportions correct. If all your guides aren't visible hit Ctrl+0 in Windows or CMD+0 in Mac to see the entire image and the Transform guides.

The brushes and pallet knife images were similarly selected with the Pen Tool and backgrounds removed. The new layers were dragged on the main image and resized.

I prefer to use the Pen Tool for selections as it is very accurate but Polygonal or Magnetic Lasso Tools and even Magic Wand Tool in Photoshop can also be used successfully to select those parts of your image you wish to cut and paste.

I now needed to create a canvas out of my poinsettia image. First, in Photoshop I applied Filter/Artistic/Paint Daubs effect for a more painterly impact for the flower. Corel Painter can also be used for similar effects. The size of the image dictates the amounts of filtering needed so some experimentation helps. I also added a Canvas texture effect in Filter/Texture/Texturizer/Canvas for the flower. Adjust the filter sliders for a suitably visible canvas effect.

To create a somewhat realistic looking canvas I added a second layer (using Layer/New) underneath the flower and filled it with beige/buff colour and added the same texture effect as in the flower layer. I used the Eraser Tool for rounding the corner areas of the flower layer slightly and erased at low opacity some of the edges to allow the canvas below to show through. I also slightly rounded the corners in the plain canvas layer below.

To allow me to drag more than one layer to the same location for further editing on a new image I Grouped & Linked my two canvas layers. To link layers hold down Ctrl key and mouse click on both layers in the Layers Palette to select and go to Layers/Link Layers or use the chain icon at the bottom of the layers palette - see the screen grab right. Next go to Layer/Group Layers for grouping. I then dragged the group on my main image. To downsize both layers in one go, activate the Group text layer on the Layers Palette and

*Right: Using Layer Style Drop Shadow with the Global Light option*

*Below: Linking layers so that they can be moved together*

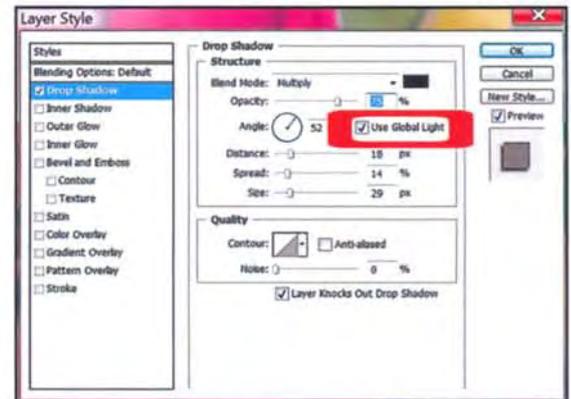


downsize layers in Edit/Transform/Scale. I also angled the group in Edit/Transform/Rotate.

All cut-out image layers were then moved to suitable locations on the new image using the Move Tool and Edit/Transform/Rotate. Once all items were placed I needed to add shadows. Uniform shadows make cut-out items look more realistic rather than appearing to float up in the air and that was my final task.

Here are some tips for creating shadows in Photoshop:

- Layer Style/Drop Shadow adds shadows on a layered image on all layers using the same shadow Angle throughout if the Use Global Light option is enabled as shown in the screen grab below. Adjust



your shadow angle degree (°) to match the direction of light on your image. I used Global Angle of 34° for all my cut-out layers as light was coming roughly from below the top right-hand corner. I also adjusted the shadow Opacity down to 63%.

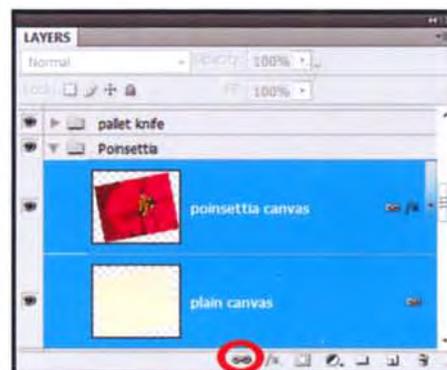
- A Layer Style Shadow effect can easily be copied to other layers by holding down the ALT (Option in Macs) key and dragging it onto other layers.

- The shadow effects can be adjusted for each layer separately. If the Shadow Distance value is lower than Size the shadow will show up all around the cut-out object. Keeping the Distance value higher than Size and adding a suitable Spread amount should enable you to create a realistic shadow effect.

- A Drop Shadow Layer Style effect can also be converted to form a separate layer. In PC's right-click on the Layers Palette, choose the shadow effect text and pick from the drop down menu

Create Layer (in Macs go to Layer Menu/Layer Style/Create Layer). You can then edit that shadow layer separately; move it around; resize in Edit/Transform; erase unnecessary areas with the Eraser Tool; and adjust its layer opacity in the Layers Palette.

And finally add your personal watermark on the image using the instructions from my article in *DIGIT* No 39, Autumn 2008 issue.



# A YEAR OF PANORAMAS

DIGIT featured some of Peter Gawthrop's remarkable panoramas in the autumn 2008 issue No 39 to celebrate his Associateship. In this article Peter describes his experiences taking panoramas in the past year. You can see more of his work and learn from his helpful tutorials at: [www.lightspacewater.net](http://www.lightspacewater.net)



2008 was a good year for my panoramic photography for, as described in an article in DIGIT 39, I achieved my ARPS in Visual Art with a panel of panoramic projections. The images were generated in January 2008 based on spherical panoramas (see DIGIT 36) taken in previous years. However, as time goes on techniques develop, new equipment and software becomes available and experience grows with practice. This article looks at the new equipment and techniques that I used last year, the new software that I tried and the wonderful places that I photographed.

If you have lost the copy of DIGIT, you can find versions of the articles available online at: [www.lightspacewater.net](http://www.lightspacewater.net)

As described previously (DIGIT 36) I used to use a three-exposure bracket to overcome the dynamic range limitations of digital cameras, but I found that high-contrast scenes (for example in the Australian bush) still had under and over exposed regions. After some investigation, I settled on a six-exposure bracket, each exposure two stops apart; this was sometimes not necessary but always gave me a good result with no under or over exposed regions after merging the pictures.

I am always frustrated by missing camera features; and in this case, although my Canon 5D can take a three exposure bracket at two stops

*Cloisters Melbourne University  
equirectangular projection*

apart it can't do more with a single button push. And as I am taking eight images, each with six brackets, there is potential for confusion.

So how to add the missing feature? The Canon 5D can be controlled via the USB port and the open-source software *multican* which you can find at: [multican.sourceforge.net](http://multican.sourceforge.net) reads a script of camera settings and sends them to the camera. For this reason, the new item of equipment in my bag last year was an ASUS Eee PC. I chose this because it is light, small, robust (the usual hard drive is replaced by flash memory) and relatively cheap. The final missing piece was a program to generate the bracketing script for *multican*.

My exposure meter told me that I needed an exposure range between an EV (exposure value) of 18 (brightest scene) and 8 (darkest scene). For depth of field reasons I use an aperture of f/16 and the fastest good-quality ISO of 400. Having reminded myself of basic camera theory I wrote a program to generate the script for *multican* with shutter times of: 1/4000; 1/1000; 1/250; 1/60; 1/15; and 0.3 seconds.

The resulting sets of images were merged using *enfuse* which you can read about in DIGIT 38.

Having set up my camera, tripod and panoramic head, and connected a long USB cable from laptop to camera, all I has to do was press return on the Eee keyboard, drop the Eee into the camera bag and rotate the panoramic head

between each bracket without needing to touch the camera. The  $8 \times 6 = 48$  images then appeared on the camera CF card ready for processing.

It is important to remember that there is more to panoramic photography than clever technology - the art of photography is as important. However, because images are taken in all directions, conventional photographic rules do not always help. In fact the two choices are: where to locate the camera and when to take the panorama.

The composite image has no frame so the usual compositional rules, such as the rule of thirds, do not apply. In fact, it is not necessary to use the viewfinder at all when taking the panorama. On the other hand, the panorama will be processed into a projection back home; and this projection will have a frame. Ideally, this final projection should be visualised when choosing the exact location of the tripod.

I am still in the early stages of learning how to do this so I can only offer some preliminary suggestions for you.



1. When the scene is symmetrical (for example inside a building) locate the tripod at a centre of symmetry. In the panorama above, the tripod was located at the centre of the archway immediately below the apex of the ceiling. The corresponding projection has a pleasing symmetry. Another example is on the cover of DIGIT 39.

2. If there is a vertical object, such as a tree (below)



that is to be the focus of the composition, the tripod must not be too close or too far from the object. For example, the Mountain Ash here is about 2m from the tripod. I find that looking through the viewfinder and the 15mm fisheye

*Right: St Pauls's Beach, Sorrento, Victoria, Australia.*

helps here.  
3. If the final projection is to be 'a view from a cave', the tripod should be located close (eg 1m) from the vertical cliff. The panorama below shows an example of this.



*Right: Port Mor, Colonsay, Scotland*

*Left: Cloisters Melbourne University stereographic projection*



*Below Left: Mountain Ash (Eucalyptus regnans), the tallest flowering plant in the world. This specimen is in Sherbrooke Forest, Victoria, Australia.*

*Below: Deep in Sherbrooke Forest*

4. If the final projection is to be a 'planet', objects should be below eye level. In the example above I was standing on a rock.

5. Locating the tripod on a path can give a nice lead in to the projection.



## DR PETER GAWTHROP ARPS

As in conventional photography, lighting is important; but once again the rules are different as the panoramic image includes all directions. Assuming a sunny day, then there are three choices regarding the sun:

- The sun is hidden by an object so the camera is in the full shade as in these two shots.



- The sun is partially shaded: that is, the camera is in partial shade as on the right.

- The sun appears directly: that is, the camera is not in a shadow as in these two.



The third condition can give nice effects, but lens flare may be a problem; taking an exposure directly into the sun, and a clean lens, reduce flare. Partially shaded sun, as illustrated at the bottom of this page, avoids flare and, as it implies that the camera is in the shadow of an object, that object and its shadow together give the basis for a powerful composition.

A new year, technology moves on and the Canon 5D Mk II is now available. Is this better than the 5D for panoramas? The sensor is the same geometric size and so the 15mm fisheye lens has an identical field of view and the basic techniques are the same. The higher usable ISO numbers (about 3 stops better) are a big advantage for taking the low EV end of the brackets as a faster shutter speed means less problems with movement of leaves etc. The presence of three sets (C1 to C3) of user-registered settings means that I can set up 2 sets of three-bracket exposures and just move the mode dial one notch to switch between them. The settings I use (with aperture f/16) are: C2 (bracket 1) Aperture f/16, ISO 400, shutter time 1/1000 and +/-2 stop bracket; C3 (bracket 2) Aperture f/16, ISO 1600, shutter time 1/60 and +/-2 stop bracket.

The bad news is that multican does not (yet) work with the Mk II; but I don't need it with the new features. My ASUS Eee is now relegated to writing articles for DIGIT!



# SHARPENING: START HERE

Most of us sharpen an image at some stage in the digital imaging process; however with the ever-increasing pixel count for digital cameras the need to sharpen every image has certainly diminished. Whether he's advising one of his students or presenting a workshop, Clive Haynes is frequently asked what sharpening methods he prefers, and how much sharpening he applies. The answer, of course, is rather like the length of the proverbial piece of string, so *DIGIT* asked Clive to begin at the beginning.



*Above: French Chateau - the example image*

If one is serious about photography and achieving quality results then it's important to retain as much control over the image work flow as possible. Beginning with the camera, I suggest that unless there is a definite need to use in-camera sharpening it is preferable to switch this option off. This is especially relevant if you shoot in JPEG.

Any sharpening undertaken in a program such as Photoshop will increase local contrast at the pixel-to-pixel level. This local contrast will, to a greater or lesser extent, introduce a 'halo' effect. The halo effect is frequently visible, appearing as an outline around an area of the image where the contrast change is at its most apparent, as in for example, the edge of a building set against the sky. You can see it starting to appear in the third and fourth sections of the enlarged crops of the chateau shown below which have been progressively sharpened.

The halo can be white or black depending upon the content of the pixels.

In other words, to make a dark edge set against a lighter tone background appear sharper, a minute white line

edge is generated to the one side of the dark edge. Conversely, to make a white edge appear sharper against darker-shaded background, a black line is generated to the one side of the light edge. It's generally regarded as bad practice to be able to see these halos and artefacts of sharpening at normal viewing distance. Frequently

*Right: When is an image sharp enough - or too sharp? Sharpening Comparisons. See overleaf for advice on how to control this undesirable effect*



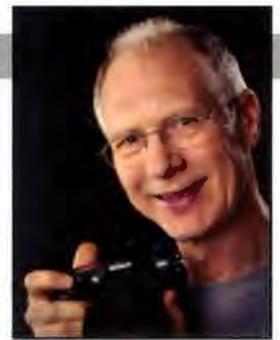
photographers are tempted to over-sharpen and of course unreal, over-corrected images are the result. We see many examples of over-sharpened images, so be very careful.



Filter>Sharpen>Unsharp Mask and is the most commonly used form of sharpening in Photoshop. The term, a seeming contradiction, originates from the print industry and the days of darkroom-based photography and relates to a sharpening effect that can be given to an image by combining a sharp original and a lighter, softly-focused, unsharp version.

When opening Unsharp Mask and looking at the dialogue box we find three levels that can be set. These are:

- Amount: This determines the amount to which you wish to sharpen - the higher the value, the more sharpening applied;
- Radius: This determines the wideness of the halo that will be produced as the sharpening increases local contrast. Low values give an almost undetectable halo whilst at higher settings the halo becomes very apparent as you will see in the screen grab below and over the page;



The amount of sharpening depends very much upon image content, your conception of the picture, the file size (small file sizes requiring less percentage sharpening than larger file sizes) and the sharpening tools at your disposal.

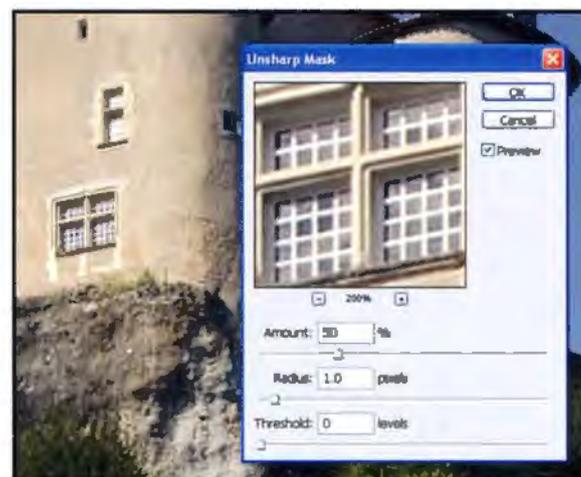
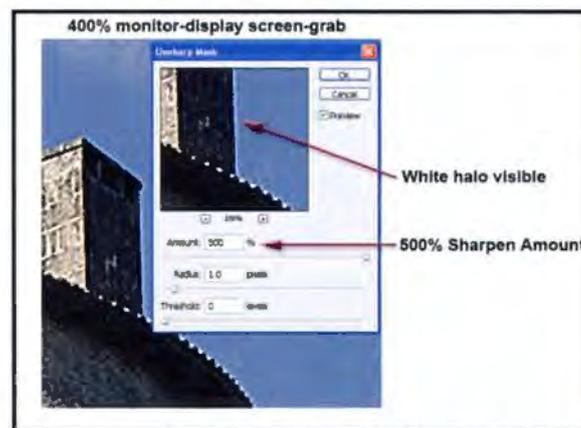
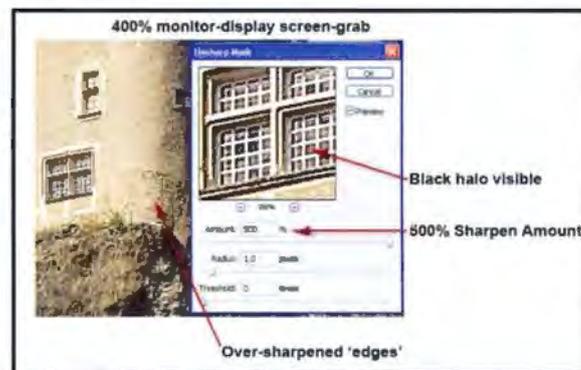
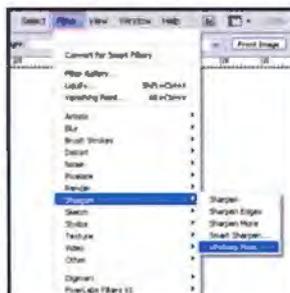
My own work flow involves opening the image in Photoshop and subtly improving and refining image delineation by using Focus Fixer V2. This is a very sophisticated program that meticulously improves the image - more information about this operation is explained in this issue of DIGIT on page 14. One can look upon this stage as subtle pre-sharpening to improve the image before further processing.

During the image work flow I make all the normal tweaks and adjustments to improve the image and to realise my pre visualisation of the outcome. At the final stage before printing I apply sharpening if required. The sharpening may be applied selectively - that is to say, only to the parts of the image where it really matters. I also decide which method of sharpening will suit the image best: Unsharp Mask, Smart Sharpen, Hi-Pass Sharpen or whatever.

I may, instead, decide to use a proprietary sharpening program such as Focal Blade, Nik Sharpener or PhotoKit Sharpener, all of which offer many levels of control.

The problem with the more simplistic sharpening methods is that they tend to be non-discriminating of image content and the entire image is sharpened to the same amount. However, even the almost universally popular Unsharp Mask (USM) sharpening filter can be applied very successfully if used with knowledge and applied with care.

Unsharp Mask is available via





**Comparative Settings of Radius for (L to R) 1.0, 2.0, 4.0 & 8.0 pixels  
Notice how the halo expands with increase in Radius setting**

● **Threshold:** This determines at what point the filter is applied. A low value ensures all pixels are sharpened. Increasing the value gradually changes the contrast point (threshold) at which the filter begins to work. Threshold alters the amount of sharpening in proportion to the contrast within the scene. Generally speaking, because we tend to use fairly low settings for USM, the Threshold is often set to zero. Experimentation will soon reveal what is best for an image.

**So, what settings are best?**

This will depend upon the resolution of the image, however as a general guide, here are some basic settings:

- Amount: Between 50% and 200%;
- Radius: Between 1.00 and 2.00. In practice however, a value of 1.00 is typical;
- Threshold: Zero. But do note that there are advantages in adjusting this setting but it is image-dependent.

**Need a Lot of Sharpening? Do it in two goes**

If an image needs a substantial boost in sharpness, it is generally considered better practice to add two 50% amounts of the setting rather than to apply the full amount in one application. Firstly, determine how much sharpening is needed, then set the Amount to 50% of the value. Re-apply the sharpening at the same setting (another 50%). For instance, say an image needed an Amount setting of 400%, Radius of 1.0 and Threshold of 0. Apply USM first as: Amount: 200%, Radius:1.0, Threshold 0.

Then do it again with the same settings. The best way to discover what settings work well with an image is to experiment.

**An improved method of Unsharp Mask using Luminosity Blend Mode**

To avoid sharpening the colour information which can reveal an increase in visible colour noise, sharpening is often better carried out in the monochrome portion of the image, known as Luminosity. The Luminosity (Lightness) content of the image provides the essential structural detail of the picture.

To sharpen the Luminosity content only copy the image to a new Layer. Change the Blend Mode of this Copy Layer from Normal to Luminosity. To do this, click on the drop-down arrow next to Normal at the top left of the Layers Palette and from the drop-down menu list of Blend Modes choose Luminosity at the bottom - see the screen grab above.



Then use Unsharp Mask or your preferred sharpening method in the usual way. Please visit my website [www.crhfoto.co.uk](http://www.crhfoto.co.uk) for more information about sharpening and related topics.



## SHOOTING THE INVISIBLE: ANOTHER VIEW

**Bert Housley read, with great interest, the first article on digital IR in the Autumn 2008 Digit No 39, by Chairman Clive Haynes FRPS. He enjoyed seeing the results that could be obtained by ‘going the whole hog with digital IR capture’ as Clive put it, and set about to immerse himself in this aspect of digital imaging. And now he tells us of his experiences and his results.**

### *Camera Conversion*

In December 2007 I had updated to my Nikon D300 (from the D200) and, because the trade-in value was poor, I decided to keep the D200 as spare body. In the event, for almost a year, it had lain in a drawer unused. I therefore decided to take the plunge and have it converted to digital IR by Advanced Camera Services of Watton, Norfolk.

I chose the 720nm IR filter for my camera conversion. Clive had mentioned a price of around £200 for the conversion: this had increased and, including carriage both ways, the total cost for a D200 conversion was £365 - a price I am quite happy with. Most of us have speciality lenses, eg macro, that are used only occasionally: I look upon the converted D200 which takes only digital IR images in a similar light.

### *White Balance*

Full details of obtaining a pre-set White Balance are fully described by Clive. All I wish to add is that you must persevere should the words No Good keep appearing in your Control Panel. In my case it took dozens of attempts before I obtained an OK which was then saved as a Custom Setting and has been used ever since. In total I have so far only taken approximately 200 images on just four short outings. I shoot with RAW and use the simultaneous jpeg facility that the D200 offers.

### *Lightroom*

Still at the beginning of my digital IR capture

### *Above: Stanage Edge*

learning curve, I realise there is still a long way to go. I normally download all my RAW images into Lightroom and now do the same with IR, the only difference being that I also download the simultaneous jpegs. As Clive says, the jpegs often give a pleasing split tone result.

For me the beauty of Lightroom is that no matter what changes you make to an image you can always go back to the original digital IR image. Having selected one of the more promising RAW captures, in Develop I first look at the Histogram to see if Exposure, Fill light or any other tone adjustments need a little tweak. I then set Clarity to 20 and Vibrance to 10 before taking the image into Photoshop. This is not what Clive has suggested and he may disagree with this treatment.

### *Channel-Swapping*

Clive's Autumn Digit article gives clear and detailed instructions how to adjust in Photoshop. You can, and I'm sure you will, experiment with other tweaks. If you don't like the result you can go back to the original RAW image in Lightroom and start again. Clive's second article in Digit Winter 2008 No 40 mentions Bit Depth, Modes and Gamut. Here I have to confess that I am almost illiterate when it comes to understanding Photoshop. I always make the excuse that it's an age thing: I am 83. I do use 16-bit working but, until reading the second article, had never heard of

Lab mode. Neither did I know anything about Gamut. There's a whole new world of exciting experiments awaiting now that Clive has whetted my appetite for digital IR!

**My Images**



*Left: Botanical Gardens Original RAW exposure with correct colour digital IR White Balance*

Living in Sheffield, on the edge of the Peak District National Park, there are some stunning landscapes just a few minutes drive away. Likewise, there are many local parks, some quite large and also a Botanical Garden whose Victorian pavilions have recently had a multi-million pound makeover. It is at some of these venues that my digital IR images were taken. Before being taken into Photoshop for the Channel Swapping adjustments described in Clive's two articles, the RAW images were first given the Lightroom tweaks described earlier. In Photoshop the Channel Swapping adjustments were made just as Clive suggested and below is the IR image, Botanical gardens 1, which I produced.

After experimenting with all the seven independent options in Lab Color which Clive so clearly describes, I chose one that resulted in the somewhat psychedelic colours shown below. It may not be to everyone's taste, or anyone's for that matter, but I enjoyed the experiments.



*Below: Botanical Gardens 1 Exposure: 1/400 sec, f/8, ISO 200, 22mm (18-200mm f/3.5-5.6 Nikor zoom lens)*





*Above: Hope Valley 1*

*From the RAW file I could not get the IR result I was seeking, it had a blue cast which I could not get rid of. I therefore used the simultaneously taken jpeg and adjusted in Photoshop via the Channel Swapping mode with a further curves tweak.*

*1/350 sec at f/9, ISO 200, 80mm (18-200mm Nikor)*

*Below: Ladybower 1*

*After the Channel Swapping adjustments, I then, in Photoshop's Hue & Saturation, reduced saturation to zero added more contrast, cropped to letterbox format and this mono image is the result.*

*1/400 sec at f/9, ISO 200, 36mm (18-200 Nikor).*



*Left: Ladybower 2 was taken a minute or so after the first shot and given the Channel Swapping adjustments. 1/500 sec at f/9, ISO 200, 52mm (18-200 Nikor).*



On the right is the first digital IR image using the correct White Balance taken with my converted D200. It happens to be the church where I was christened in 1925 and is now part of the nearby Sheffield University. The light was not very good, with a dull grey sky. However after the Channel Swapping adjustments and an additional tweak in curves this was the result.

*Right: St. George's Church  
1/60 sec at f/8, ISO 200, 24 mm (18-200 Nikor)*



Both images below were produced from the same RAW exposure with very slightly different crops. Stanage Edge 4 was given the same treatment as Ladybower 1 to produce a mono image whilst Stanage Edge 5 received Channel Swapping and tweaking.



*Stanage Edge 4 and 5.  
1/250 sec at f/9,  
ISO 200,  
18mm (18-200 Nikor)*

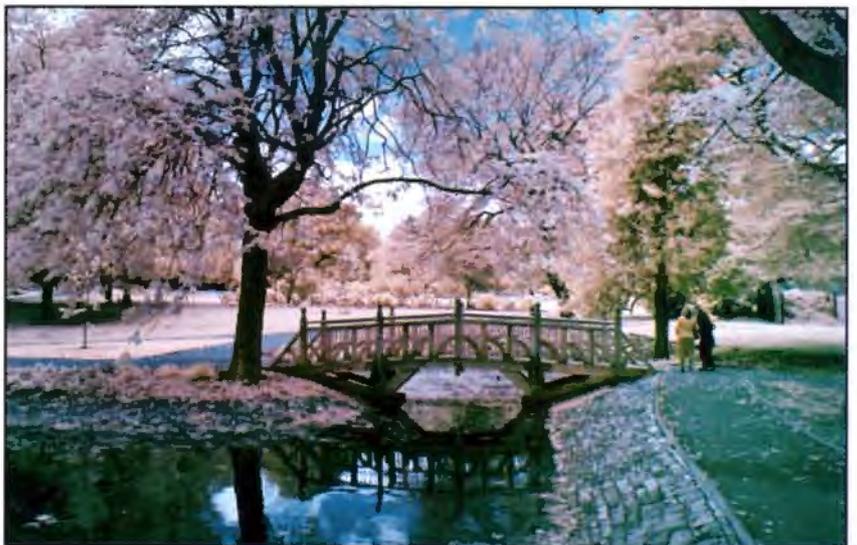


With the images below I have a confession to make. On receipt of the D200 after the digital IR conversion, I had thought that the White Balance had been set correctly as described in Clive's first article. I was wrong. When I downloaded my first IR images the RAW files had a strong magenta cast; all of them were deleted except the one below, on the left, which I liked the look of. After speaking to Clive, who encouraged me to

persevere, I finally managed to obtain the correct digital IR White Balance. Subsequently, with this RAW image taken with the wrong White Balance I fiddled with colours in Lightroom and managed to reduce the strong magenta cast before taking it into Photoshop for the Channel Swapping adjustments. After quite a bit of trial and error the final result is shown below.



*Above: Weston Park  
Original image with incorrectly set White Balance  
Right: After Channel Swapping adjustments*



All this goes to confirm what Clive said in his first article and I quote: 'Hopefully I have whetted your appetite and that these few images will indicate the riches that are out there - awaiting discovery in the invisible spectrum.'

I am at the beginning of my learning curve with digital IR. For me the first results are quite promising and I look forward to spring and summer when there will be much more green leaves, grass and foliage around.

# DIG NORTHERN INDIA TOUR

Nineteen photographers flew into Delhi on 9 January for the RPS DI India tour. Everyone on the trip was greatly indebted to Peter 'Fuzz' Jordan of Darjeeling Tours, our very capable tour organizer and leader, with his helper Karen Nixon. Graham Whistler was the photographic leader, with his wife Wendy doubling as tour doctor. Graham recounts the highlights of the trip with just a few photographs; and on page 46 two fellow DI Group members give their view of the Indian tour.

Sadly, apart from Wendy and me there were only three other RPS members, despite advertising full page in Practical Photography two months running. Despite extensive advertising and promotion by our committee, after six months it looked like there was so little interest shown by Group members that Peter Jordan had to take over as agreed and open the tour to his much wider list of clients. The tour was a great success with a wonderful variety of photographic subjects. We even had our own specially chartered steam trains on the Darjeeling Himalayan Railway for three days to photograph, ride on and dine on.

The first day we travelled by coach to Jaipur the Pink City stopping on route for lunch and photography of a typical Indian village. The following day we started with a gentle walking tour through the teeming street markets of Jaipur. At every corner were new pictures to be taken, stalls, pavement craftsmen, snake charmers, chaotic traffic, historic buildings even a street photographer using a 100 year old camera. He took my picture and produced a black and white paper negative, re-photographed it and produced, in-camera, a finished print in less than 5 minutes. You can see the result on the opposite page.



The following day we had an amazing elephant ride to the Amber Palace high on the hills above Jaipur with superb views of the surrounding mountains and a seven mile fortified protective wall modelled on the Great Wall of China. The wealth and beauty of the palace was in dramatic contrast to a party of Indian women dressed in bright saris moving heavy rocks to repair a courtyard. Women labourers working without modern tools are a common sight in India.

Monday saw us in Agra photographing the Taj Mahal: we were lucky with light atmospheric

## An appreciation

*Michael Hambrook writes from Australia: Wow! What a great experience it was going on the RPS photo tour of India. You don't get many subjects more photogenic than India's sights and Graham Whistler's guided tour excelled, with unobtrusive advice whispered in our ears just before we hit the button so we got the best vantage points and sound advice on exposure and shutter speeds. Invaluable.*



*The 100 year old camera in action  
Photo:  
Dr Wendy Whistler*

*Monkey Darjeeling*

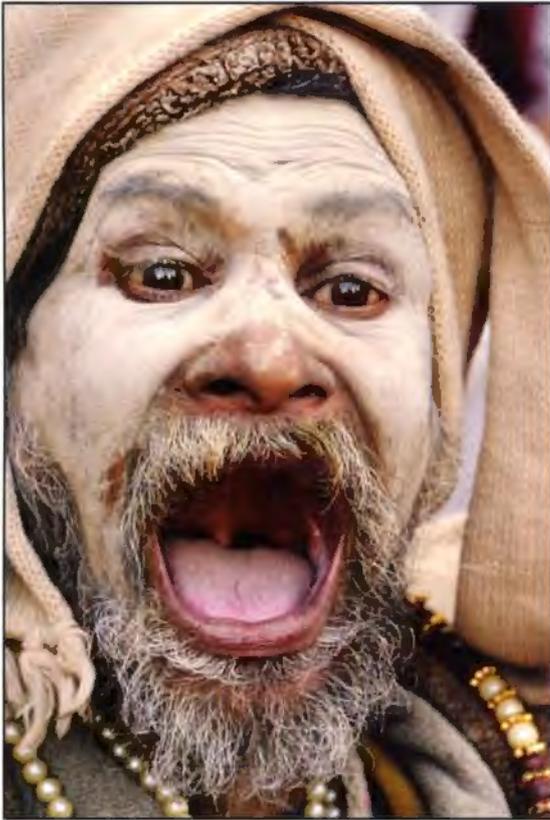
mist, clearing later to bright sun. In the evening we returned for sunset across the river with the Taj transformed by the soft warm light.

Tuesday and Wednesday we were busy again in Delhi with tours of splendid Raj government buildings, Humayan's Tomb, Q'tub Minar tower and ruins. Our cameras worked overtime. We then flew to Bagdogra and Siliguri and the start of the Darjeeling Himalayan Railway.



Thursday night saw us at the Jaldapara Wildlife Reserve up at dawn (following a very cold night in basic accommodation) for a game viewing elephant ride. The area was not teeming with animals but we did see the elusive one-horned rhino and some wild elephants but no tigers! Friday evening we were back at Siliguri in time for an evening steam ride on the Darjeeling Railway and as night fell we were served a super Indian meal with the little locomotive working hard to pull us up into the forest and the start of the formidable climb up the foothills. On our return by coach two wild elephants crossed in front of us. The following morning we had another steam charter and covered the lower part of the line between Siliguri and New Jalpaiguri with footplate rides for the enthusiasts. The train paused at various interesting sections letting the photographers off to film and photograph several dramatic steam run passes. Back in our hotel that evening Peter gave a talk on the history of the railway and I





explained the problems of photographing the action we would see the next day.

Sunday morning was our main steam charter covering the rest of the line all the way up to Ghum, the summit at 7407 feet. Peter had a small coach standing by so it was possible to travel on the train or the coach. Those of us on the coach were able to race ahead of the train and set up to photograph it on the way past. Then back into the coach, overtake the hard working little train and set up at the next photographic location. There were plenty of chances at stations or watering points for people to change over to ride the train or take a turn on the coach for dramatic line-side photography as the little train worked its way up the steep foothills. All agreed that it was a day of dramatic photography of this amazing little railway.

Sadly the mist came down in the evening so the Himalayan Mountains were hidden from view. In fact the mist remained for the four days in Darjeeling and it was only as we flew back to Calcutta that the aeroplane climbed out of the mist revealing the mountains in bright sun with a clear view of Everest in the distance.

Darjeeling was one of the old hill stations, at 6812 feet. The climate is much cooler than the plains below: we had fires in our bedrooms and hot-water bottles in the bed! It is now a major area of Indian tourism with sprawling markets and shops. It is not the cleanest of places and development has been undisciplined but it is great for photography. The railway has largely been taken over by road transport as the little train takes eight hours or more to climb the 55 miles compared with three hours by road. RPS members Pam and Eddy Lane (see their photos and report on page



*Above:*  
*Paper negative and print*  
*Left:*  
*Holy Man Jaipur*  
*Right:*  
*Shoe Clean Jaipur*  
*Below:*  
*Snake Charmer*



44) came with me the following day to enjoy a walk through the Darjeeling market photographing the people. We got plenty of good pictures and I was pleased to get more images for my hands project - more of which in a later issue. On the way down to Siliguri we called in at one of the many tea estates. The following day after a visit to a colourful Buddhist Temple, we flew to Calcutta for the final two days in one of the busiest cities in the world. We had guided walks through historic areas, bustling markets, and a chartered tram ride. An afternoon cruise up the Hooghly River (a branch of the Ganges) provided many more subjects for our cameras.



With over a billion people in India I understand that over 80% of the population hardly earn enough to live. Many live on the street in desperately dirty city slums. We took many pictures in such places but always found the people gentle and very happy to be photographed for a modest fee. (Plenty of small denomination notes oils good photography!) In tourist areas beggars and street vendors can be a major nuisance: avoid eye contact and walk on!

We were all very happy with our pictures. India is indeed a great place for serious photographers.

# INDIA TWO

DI Group members Pam and Eddy Lane had been in the Masai Mara photographing the Wildebeest migration, and so decided to capitalise on all their still current jabs and visit India for the first time. But where to start? They'd had vague advice about Rajasthan and the Golden Triangle but seeing the DI Group flyer they decided this tour would be a great introduction to the country, especially as it involved railways trains. Here Pam relates their experiences and shows off some of their photos.



*Tour Group at the Darjeeling railway. Photo by tour leader Peter 'Fuzz' Jordan*

start, it was a challenge as the early morning mist meant it merged into the background. However, after a guided tour, which now includes the Princess Diana Seat the mist cleared and the Taj emerged in all its glory, sparkling in the sun. This didn't make photography any easier but the sight was breathtaking. Our evening visit to capture the reflections of this icon from across the river was enlivened by the enterprise of two local lads who brought their camel down to help set the scene and

The first part of the trip was indeed the Golden Triangle, Jaipur, Agra and Delhi. Our first day in Jaipur included a walking tour to the Palace of the Winds and nothing could have prepared us for the sights, sounds and smells of street life in India. At first, it seemed like a scene from a chaotic Hollywood disaster movie.

*Steam Up! Eddy Lane*

Then, as we gradually became used to it, a pattern and rhythm emerged. Graham's advice of going with the flow certainly helped - but where to point the camera: there were scenarios unfolding all around. On the swaying elephant ride up to the Amber Fort we had to admire the balance and tenacity of the local photographers as they teetered on the edge of the walls trying to photograph us. I think this was however less difficult than trying to recognise their potential customers on our exit - our jeep was enthusiastically followed by crazy scooter drivers waving blurry images of bemused/scared tourists on elephants.

*Buddhist Temple Pam Lane*

This was in contrast to the peace and tranquillity of the Taj Mahal in Agra. Having seen it many times in print, we thought we would be disappointed. To



give rides - after some good natured bartering a few rupees exchanged hands.

On to Delhi and the Q'tub Minar Tower and Humayan's Tomb. Here we could all get the classic shot of the tower through the archway and if we were getting a little jaded with ancient palaces, the local school children on their educational trips provided lots of entertainment.

Next, we flew to Siliguri at the foot of the Darjeeling Himalayan Railway. The rising excitement amongst the 'puffer-nutters' was palpable. The plan was that after an initial steam hauled dinner train experience to Rangtong, we would take two days to ride the train up to Darjeeling, whilst a coach ran alongside and stopped for photographs. The evening dining experience was fantastic. The crew effortlessly produced a superb meal from a minute galley, presented with some style. British Rail please note.

However, the next day, one of the many demonstrations that occur in India closed the track at Kurseong. Plan B was immediately implemented and the train took us instead through the local bazaars, everybody waved and genuinely seemed pleased to see us. On the following day our wonderful team swung into action and implemented plan C. One of the three carriages was disconnected, steam was up and we were going to make the 60 mile, 7,000 feet trip in one day. Even the non 'puffer-nutters' sensed history was in the making. I decided to ride the train and photograph the scenery whilst Ed opted for the coach.

The problem was that the train set off at such a speed that the coach had a hard time catching up, let alone overtaking and stopping for head-on photographs. We stopped briefly at Tindharia for a blessing and caught up with the demonstration at Kurseong. Our photographs look as though we had more passengers than usual waiting for the train - several thousand in fact. After ten hours of puffing, watering and coaling our little 'Toy' train steamed victoriously into Darjeeling Station. We all felt as though we'd just relieved Mafeking and a tremendous sense of achievement for our crew. The two days in Darjeeling were a world away from the plains of Rajasthan. The locals seemed more Nepalese than Indian and Hindu temples gave way to Buddhist Monasteries. Walking through the markets we had some great interaction with the shoe shine boys: Ed and Graham came away with beautiful shiny shoes and some great shots. Our only disappointment was that it was too misty to make out Kachenjunga, the third highest peak in the Himalayas. On the way back down to Siliguri we stopped at Sekim Hill Tea Estate, for



*Q'tub Minar Tower  
Pam Lane*

another superb meal and some great shots of the feisty ladies who pick the tea.

After a very special blessing from the priest at the Buddhist temple in Siliguri, who sounded as though he'd been educated at Eton and Oxbridge, we headed to the Airport. The mist had closed in again for our flight down to Kolkata (Calcutta), but not to be deterred Fuzz, our tour leader, implemented plan F and got us on the last flight out. As we climbed above the mist we not only saw Kachenjunga in all its glory but also Everest - an incredible sight.

Our luggage missed the flight to Kolkata but followed overnight on one of the scheduled buses, escorted by the porter from our hotel in Siliguri who had to pay many rupees excess baggage!

The highlight of Kolkata was our chartered tram through the street life. By this time the group had been in India more than two weeks and we could really interact positively with all the locals. The tram acted as a mobile hide and we were able to take shots that would have been impossible on foot. Again, a demonstration made life interesting as it slowed the tram down to walking pace which helped the photography and the banter on the street. In fact I think the tram formed part of the demonstration at one point.

That last evening we walked to a Chinese Restaurant for dinner. Due to the usual chaos we were served far too much food. We had the restaurant create many doggie bags and gave it out to the surprised street families on our way back to the hotel. Just a very small gesture back to the community.

With heavy editing we came back with over 1,000 photos each, an endless source of stories to tell and some fantastic memories.

*More pictures and equipment details next page. ▶*



*Kolkata Idol production  
Eddy Lane*



## PAM AND EDDY LANE LRPS



*From the top:  
Kolkata tram  
Boys  
Eddy Lane*



*Happy to See  
You!  
Pam Lane*

*Kurseong  
Station  
Pam Lane*

*Ganges Hay  
Transport  
Eddy Lane*



Pam and Eddy both retired as accountants three years ago to spend more time on photography. Eddy became Chairman of Calne Woodlands Camera Club and Pam the Treasurer - and both gained their L. They regularly make digital image presentations to camera clubs and other organisations on their extensive travel. The current talks include In the Footsteps of Shackleton covering Antarctica, South Georgia and the Falklands; Masai Mara Wildebeest Trek; and Unique Wildlife of the Galapagos. And of course they have now added RPS DI Group Tour of Northern India! They both hope to add an A this year.

Eddy took his new Canon EOS 5D Mark II, with his trusty EOS 5D relegated to back up. Pam had the Nikon D300, another great camera - their deliberate mix of manufacturers is a very drastic way to ensure that they never argue over authorship of the images, Eddy told *DIGIT!*

To match the Mark II, Eddy also had the new Canon 24 - 105 L Series lens which was hardly off the camera except when it fell out of his pocket from the back of an elephant while photographing rhino! Apart from needing a clean, it survived the 8 foot fall without any damage.

On their trips they take approx 30Gb each in CF cards and back up daily onto a Jobo Giga Vu portable drive, never wiping the cards until all images are unloaded and backed up on their home PCs. Even after editing regularly every day they ended up with about 1,000 images each in dual Raw and JPEG formats. The JPEGs are used for digitally projected shows and the Raws for A3+ exhibition prints.

There were no problems with battery charging anywhere in India, as we they were always overnighing in hotels with mains electricity, albeit with a wide range of sockets. There was rarely any difficulty in photographing the local population as Pam and Eddy always tried to treat them with a smile and the greatest possible respect and politeness - the children loved to see their images on the now larger camera screens, and this always guaranteed them a constant stream of new willing subjects!

'The only real dilemma of India', said Eddy, 'is shot selection and composition. There is such a wealth of colour and interest to overwhelm you at almost every turn.'



# MY NEW YEAR'S RESOLUTION: 360PPI!

Alan Cross looks at printer resolution, makes a few tests, and draws some conclusions which you can test yourself and join the debate.

Contact Alan by E-mail: [alan@alancrossphotography.com](mailto:alan@alancrossphotography.com)

You've heard it said by the 'experts' ...

*'I've always printed at 300ppi, and always will.'*

*'My printer works best at 360ppi.'*

*'I can tell the difference between a 300ppi and a 600ppi print.'*

*'A 200ppi print looks perfect to me.'*

*'I always like to examine my A2 prints with a loupe.'*

*'Never print at more than 180ppi - it's all the same to the printer.'*

There are so many views on print resolution. Setting aside the questions of what the eye can actually see, how big your print is, and how far away you view it, there is also a continuing debate on what your printer can actually achieve. One figure that intrigued me was something reportedly said by a paper supplier - the one about never using more than 180 ppi. I decided to test this notion.

### The tests

To find out how true this is, I carried out a series of tests and presented the results to our local DIG region, Thames Valley, in 2008 as part of a printing workshop. I made sets of prints of line and dot patterns (see right) at different resolutions: all were blocks of one or more black or white pixels alternating. I ran them to the printer without resampling. My printers are Epson 2400 and 3800. I ran tests on both at 120, 180, 200, 240, 260, 280, 300, 320, 340, 360, 380, 400, 480 and 720ppi. You might say these are extreme and unrealistic tests, but I see it as no different to putting test tones through a piece of hi-fi kit at the design stage - get that right and everything in the real world should be optimised. Even if you can't always see the difference, there is a comfort factor that comes with knowing things are as right as they can be. And there may well be occasions, of course, when you feel the need to photograph a wicket fence on the horizon!

I produced 14 test files - one at each resolution - and arranged them such that they could all be printed as adjacent patterns on a single sheet of A4 paper - which I passed through the printer 14 times!

As an additional test I then took some of the 'bad' print image files, resampled them up to 360ppi in Photoshop, and printed them all as one file.

### Results

Both printers could cleanly resolve the pixels at 360ppi, though my less-than-perfect eyes needed a magnifying glass to see the dots clearly. Severe moiré was obvious at most resolutions that were

not simple ratios to 360. Figures of 180ppi and 240ppi came a close joint second. Interestingly, a resolution of 720ppi on the 3800 produced absolutely nothing - just white paper!

When I resampled the 'bad' patches to 360ppi in Photoshop the results were much better than when printed at their native resolution.

### Theory

So what's happening? Well, it is understood (though not widely publicised) that the Epson engine runs at 360ppi, and their dots per inch figures are multiples of this. Remember that dots per inch (dpi) are not the same as pixels per inch (ppi): it takes a lot of inkjet dots to make one inkjet pixel. I believe that, whatever resolution you throw at the printer, the driver has to resample it to 360ppi in order to drive the dots to the paper. However, I believe that the resampling algorithm in the Epson driver is nothing like as smart as Photoshop, so you get patterning at some frequencies.

### Practice

I now print at 360ppi where possible, as this makes no demands on the driver. But you can actually get away with a simple sub-multiple of this and I may print, according to the resolution of the original, at 240 (2:3) or 180ppi (1:2) as, with these resolutions, the driver resampler is not overly challenged.

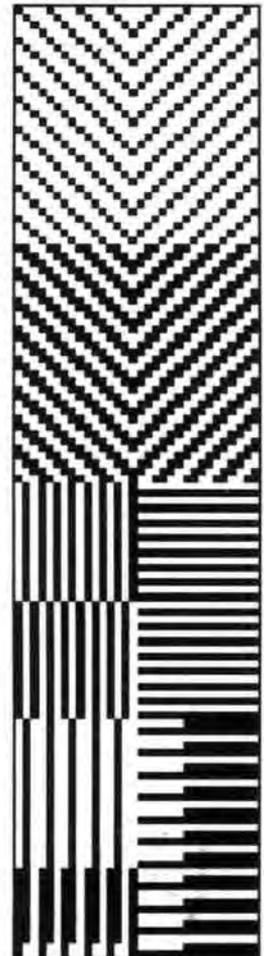
Certainly I would never choose to achieve my required print size without resampling - you can end up with some very odd ppi figures this way which leaves too much resampling work for the printer driver to do.

### Your own tests?

I would have liked to have presented the results here graphically but readers will appreciate that any scans of the prints for *DIGIT* will suffer from additional artefacts from the scans, and not reveal the true story. However, the best judgement you can make is with your own tests and, to this end, I'm happy to make the master TIFFs available to any *DIGIT* reader who cares to email me. The files assume A4 with a 3 mm border, the Epson standard. If you need to reduce the size of the images slightly be sure to crop a little off the edges without resampling - if you resample them you will completely invalidate your tests! It would be interesting to hear of any results from other members, particularly with other brands of inkjet printer, or indeed other technologies such as dye sublimation. I shall watch the Forum and the pages of *DIGIT* with interest!



*Since leaving television in the early 90s, Alan has set up his own business providing photographic restoration services, bespoke web sites (with a strong photographic flavour), and fine art printing for artists. You'll find Alan's website with his images at: [www.alancrossphotography.com](http://www.alancrossphotography.com)*



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