Photography

Seeing versus Looking

February 2, 2018 | Charles T. Low, Photographer

The real sight-organ is the brain

The joy of photography resides, in part, in the challenge of *i) finding a pleasing scene and then ii) deducing how to translate that into a pleasing photograph*.

It comes as a shock, to many photographers, that simply finding something "nice", and then lining it up and shooting, often results in .. well ... let's charitably call them "suboptimal" photographs.

Or why does the converse sometimes occur: you may i) recognize an otherwise *banal* scene as ii) containing the elements of a *good* photograph!

> (By "scene" I refer simply to the object or subject of a photograph, which could be anything from the Universe to an electron-microscope image.)

Why does these things happen? **It has something do with the difference between looking versus seeing - what we might call "*intentionally* seeing"**.

Most of us have encountered these concepts before, the crux being the disjunction between the "data" which our eyes collect and the "interpretation" which our brains impute into it. Not all of us, however, have thought about it in the context of photography.

In the following, you will have the unparalleled experience of seeing some photographs of my own ... not all of which I like. I'm sure I'm breaking some pretty fundamental marketing rule, but regardless: here goes.

You might imagine that, hungry to practise my craft, I found these lovely textures, lines, old tools and ropes on the wall inside this boathouse ... and so released the shutter. Nothing about my "hope" for this scene produced a good photograph - I still cannot actually like it.

Brain-seeing

Simply going about our lives provides easy, simple illustrations of "brain-seeing" versus "eye-seeing", in which what we see with our eyes does not correspond with how are brains process the signals.

Brain-seeing Illustration #1
Who hasn't found a lost object ... *the third time they looked in the same place*? The missing object clearly hadn't moved, and our eyes *must* have registered it the first two times, and yet we didn't see it. We looked, but did not see. To see it we had to look more actively.

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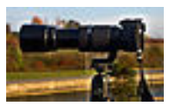

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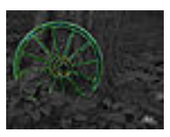

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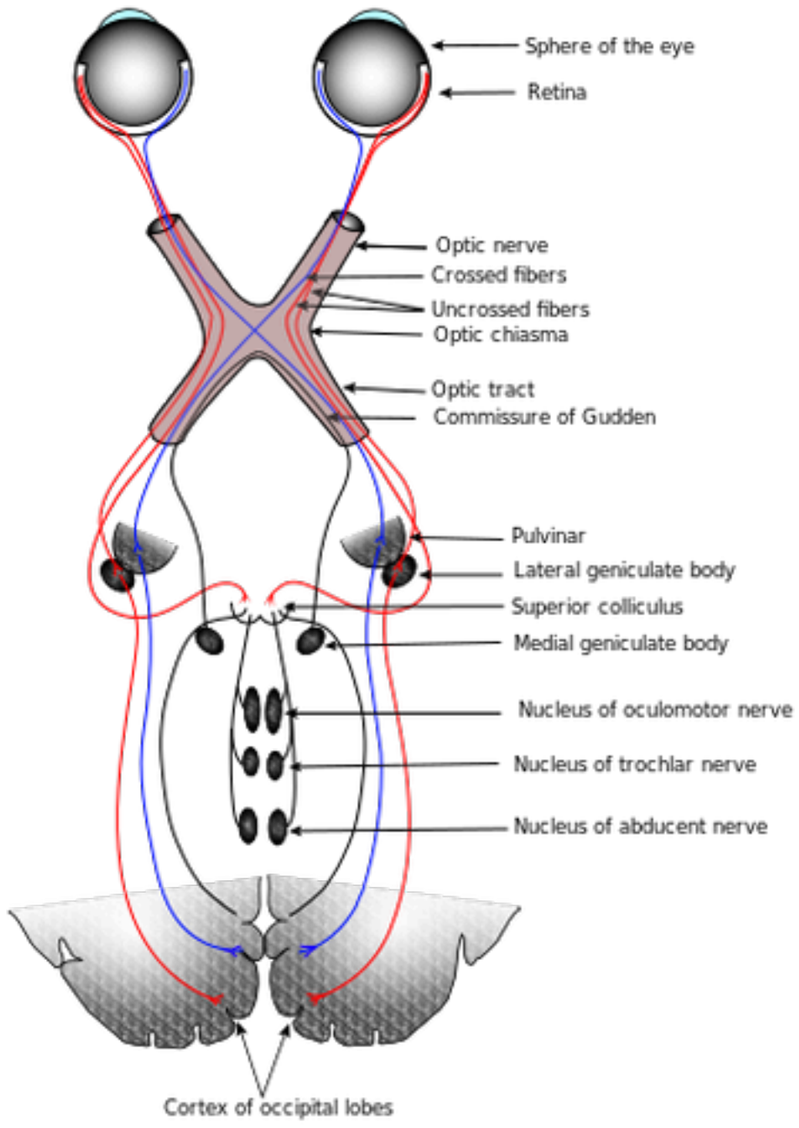
We can only guess at the details of the complex physiology underlying this, while understanding this more accessible overview: we see with our brains. The "visual cortex" in fact lives in the occipital region of our brains, at the very back, and if that gets damaged, then we lose vision, even as the actual eyes continue to function normally. We need our brains to enable sight.

The left occipital cortex "sees" the right side of our visual field, and vice versa. Check out the anatomy of the optic nerves if you wish to understand more about why that happens.



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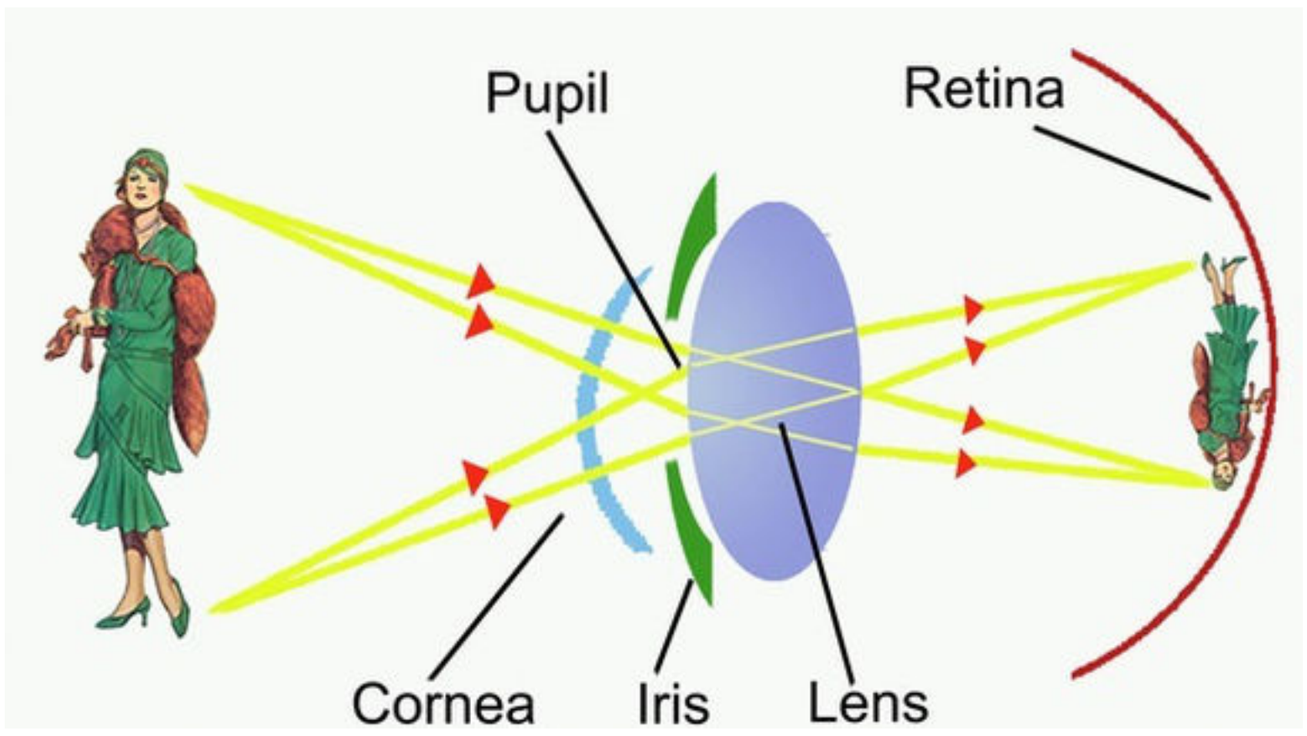
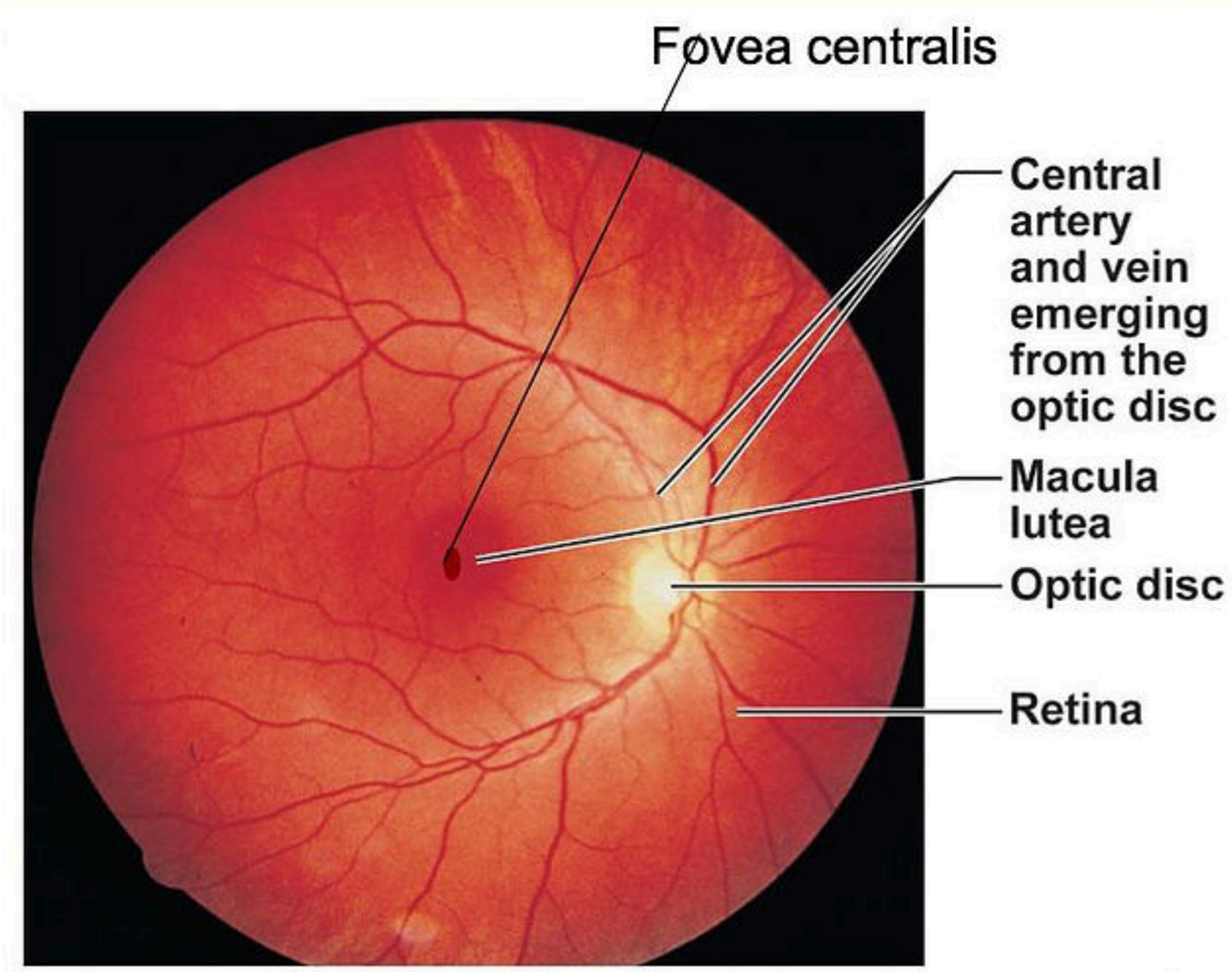
We "see", of course, upside-down and left-to right; at least, the eyeball's retina receives the image that way. Our brains turn it around, and we perceive it correctly.



Brain-seeing Illustration #2
Each retina has a little blind-spot in it, the optic disc, where the optic nerve attaches, and we can't see there. The brain imagines the missing information and fills it in for us. We can easily understand how that could happen with binocular vision, because one eye records the part of our visual field which the other eye misses. However ... the blind spot fills in even with monocular vision.



Looking into the right eye

You can demonstrate this to yourself by knowing that the optic disc sits a little to the inside of the visual centre of the retina (the "macula" containing the "fovea") and just the slightest bit lower. Close one eye. Hold a pencil, with the eraser upwards, about half an arm's-length in front of the open eye, dead centre, and then slowly move it off laterally, away from your nose, in other words, and just a little up bit up. Do not follow it with your eye; keep looking straight ahead. You will find a small point at which the eraser disappears.

You have found the optic nerve head. We're all blind in that little spot, which sits on the retina, inward ("medial" or "nasal") and a bit below the centre; it corresponds to the blind spot on the pencil, lateral and a bit above centre, because of the retina's reversed, upside-down image.

Remove the pencil-tip eraser, and the blind spot ... vanishes.

So, there you go. We never see the blind spot, which however definitely exists. Our brains very persistently and effectively fool us into seeing something from our retina's blind spot.

Brain-seeing Illustration #3
Stereoscopic vision must arise entirely from the brain. Our retinas, by simple optics, can only receive flat, two-dimensional images. (All right: retinas are curved, but the principle applies.) And yet, most of us find the impression of three-dimensionality overwhelmingly undeniable. What sophisticated processes the brain performs to produce this, from the slightly different images from each eye, awes me. It happens in real time, all the time, without any conscious thought. Amazing! And we know, from very basic physics, that it can only result from illusion - a very useful, brain-generated illusion, but illusion nonetheless.

Strangely, however, even people with single-eye vision see "depth" in the world, not quite as vibrantly as with two eyes, but it comes from other brain-controlled factors, including i) *knowing* that the world exists in three dimensions, and ii) moving the head slightly to generate different images in *time* if not in *space*. These and probably other factors allow the brain to construct a scene for us in 3D.

> (Also, interestingly, a significant proportion of the population cannot watch 3D movies. They feel ill - headachy, nauseated, etc. Their brains clearly process the third dimension differently from mine.)

In summary, it's all in the brain. Our eyes only collect data, converting photonic energy into electro-chemical-biologic signals, but we *see* with our brains.

Apply this to photography

The differences matter immensely, between:

- how we see with our brains and
- what the photograph will look like.

A couple of things happen. (You will notice that the "things" overlap.)

Thing #1
As noted above, we see stereoscopically. The third dimension so often gives the scene, to our naked eye (i.e. "naked brain"), that extra oomph, and that effect, for all practical purposes, often completely and very consistently disappears in the finished photograph.

Now ... a photograph can literally only *have* two dimensions anyway (ignoring the rare technique of stereoscopic photography). The often intense illusion of a third dimension remains just that: an illusion.

Actually touch the screen. You already know that it's flat, but you may have to remind yourself, so powerfully does the scene look three-dimensional. The "far-away" bits sit at the same distance from you as the "near" bits, when you touch them. They don't look that way, but the third dimension is a total illusion.
(Now: clean your screen where you touched it!)

So, sometimes, as in the preceding example, the illusion works. But sometimes it does not.

The small tree on the left actually sits quite a bit further away than the big tree. But without any visual cues to that, we simply cannot "see" it in a (flat, two-dimensional) photograph. (Nor, as in this image, does it always matter.)

Thing #2
The phenomenon extends beyond three-dimensionality.

This scene, a fantastic visual feast to the "eye", as a photograph turned into a messy hodgepodge with a scruffy, distracting background. On location, the red, ice-encased branches enthralled me, and my brain separated them from the background, "seeing" what I was mentally focussing on, for reasons described above ... not what was really there. A photograph shows no such mercy, even when a three-dimensional illusion persists.

Thing #3

Our brains filter. Not only do they fill *in* missing "information" (as at the optic disc) but they filter *out* extraneous information. They tend to see what we expect to see, not what is actually there. Clutter or scruff in the scene disappears from our consciousness, and then reappears in the photograph.

I had to edit this image of a local statue quite drastically, to conform more closely to what I "saw" at the location.

But the image out of the camera showed something quite different. No one at the scene would ever think, "Oh, what a lovely memorial statue ... but too bad about the background!" Our brains will not - quite incredibly *cannot* - see the background. The photograph shows no such mercy!

Thing #4
Variable spot-focus: another amazing, astounding fact about vision is that, although we can tell immediately whether something is in focus or not, almost nothing that we see truly is in focus. The eye only focusses sharply at an extremely small point in the centre of the retina, the fovea. So, when we view a scene, with our eye-brain complex, our eyes quickly scan around it, focussing on various aspects of it, left and right, up and down ... but also very importantly, *near and far*.

The brain very kindly constructs a composite image for us, which is not how the eyeball itself actually sensed the light from the scene.

Photographs (like any two-dimensional medium) do not do that. First of all, photographs only exist in two dimensions (see above!), so once we have focussed our eyes on the image, everything in it will appear as sharp as it possibly can.

Now, lenses provide a thing called "depth of field". Consider that when you focus a lens, you focus it on a point (or, more correctly, a "plane"), and everything ahead of and behind that point is, to some degree, out of focus. The distance ahead of and behind the plane of focus which remains acceptably sharp - the depth of field - varies with the aperture of the lens. A wide aperture provides a shallow depth, and a small aperture a large depth.

This happens with eyeball lenses too - things will look sharper, simply because of depth of field, in bright light because your pupil gets smaller. It's why people squint sometimes to see more clearly - we can't consciously make the pupil smaller so we make the opening between the lids smaller.

> (Very small and very large apertures introduce other distortions, and most camera lenses have an optimal aperture, somewhere in the middle, often around f8 for full-frame-sensor cameras, perhaps f5.6 for the smaller micro-Fourh-Thrids sensors, which produce the sharpest image - *at the point of focus*. This sharpest image in other words will not have maximal depth of field. The two separate concepts of sharpness and depth can be confusing, but separate they remain.)

So, now we may have a photograph with out-of-focus parts in it. We will often have created it that way *intentionally*. But we *cannot* have seen it that way with our naked eye. Our brains will not allow it, because our eyes continually focus and scan. Sometimes this means finding an unexceptional scene, and imagining how a photograph of it will look.

This scene, photographed with a fairly wide aperture of f3.5, *could* not appear this way, with such a shallow depth of field, to the eye-brain, which focusses on almost nothing ... and on everything.

Sometimes it means finding an exceptional scene, and *failing* to make a good photograph of it.

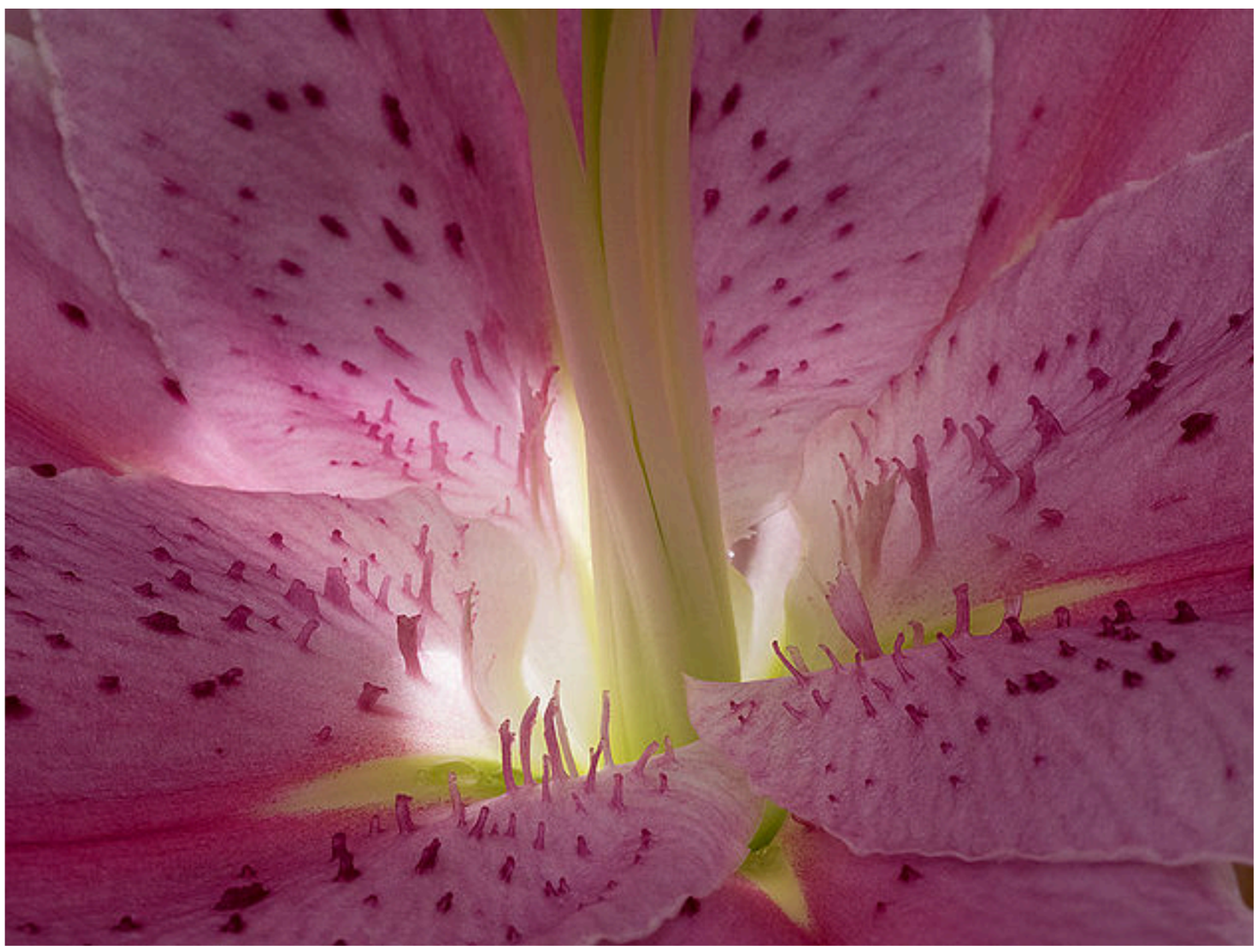
I could not transform this visual delight into a photograph. Trying shallow and deep depths-of-field, different vantages and distances, neither I nor a companion photographer could make it yield. Yet it appealed to our naked eyes (i.e. brains)!

Thing #5
Unlike a photograph, our field of vision is much less framed. A human's peripheral vision extends pretty well to 180 degrees, although most of it, as noted above, is highly out of focus. Still, the visual impact something has on us may depend on the overall context. Frame a small part of the scene, and the impact may vanish.

That in no way contradicts the usual compositional advice to home in on your subject. It does mean to think "framed". Does your photograph require context? Will even large blank areas contribute something important? Do you need to show your subject in its environment?

This photograph, ostensibly of a tree, actually shows a tree, on a horizon, in the context of a field, and of sky. I actively wanted the entirety of it.

More often, our brains have homed in on something specific ... but neglected to tell us! To illustrate better what attracted us in the first place, get rid of the unnecessary. The context which our eyes recorded but which the brain filtered out must be *actively* removed by the photographer in order to make an effective photograph.



Sometimes, the thing which calls to us comprises only a small part of what our eyes saw.

Thing #6
We know something personal about the subject matter. This could mean any of a myriad of things.

I have heard people say things like:

- I was really happy when I took that photograph (doesn't matter unless you can convey that in the photograph).
- I really like that person whom I photographed (doesn't matter unless you have made a good photograph).
- I'm interested in the subject material of this photograph (doesn't matter unless you can convey something about it, without the viewer knowing anything about *you*).

Now, I have one caveat: snapshots. Not meaning to use the word "snapshot" pejoratively, but if you just want a casual photo for your own interest or as a memento of something, then fine. Have it! But the photograph itself does not think or feel; *it does not care about you*. It's just an image. Your attachment to your mood or to a person, place, thing or event, does not automatically show in a photograph. Don't expect the World to *guess* why you like it; instead, finesse a way to *show* the World why you like it.

I know someone named Tom. He's old. (Sorry, Dad.) Didn't you know?!? So, there's nothing particularly to recommend this photo ... except for me and him! (Although he doesn't particularly like egg nog.)

What to do about it

It requires conscious thought to "see like a camera".

- Understand that the third dimension may vanish, and yet that you can create it by illusion.
- Think about what your brain has filtered - out *or* in - and learn to compare that in your imagination with how the finished photograph will look. Abandon emotion and personal attachment (or at least consider doing so), and try to look at the image from the point of view of someone who doesn't know anything about it.
- One aid for these things is to think: "**two-dimensional, framed**". There's a reason that artists hold up their hands to create a frame. Often, this will guide you more than you might think. And in photography, we have another frame: the viewfinder (or viewing screen). Look at it more discerningly. Forget what the scene looked like to your eye, two seconds earlier, and re-evaluate, critically, dispassionately, even harshly, what it now looks like as a photograph. The difference will often astound you.

Some experts believe that a viewfinder, which we hold our eye up to and look *through*, creates a more illusory brain effect than a viewing *screen*, like the LCD screen on the back of a camera, which we look *at*. Regardless, the principle applies, of learning to see like a camera.

Intellectualize all of the above. Learn to "see intentionally", rather than passively.

Conclusion

We see with our brains - and good for us! There are good reasons for that, and most often it works well. It does however present real and formidable challenges and obstacles when attempting to make photographs. For many reasons, including but not limited to those described above, *what we see will quite likely not resemble the resulting photograph*.

This illustrates the general principle that a skilled photographer does not *take* photographs, she *makes* photographs. It requires conscious thought, practice, training and experience to translate what we find into a pleasing image.

It bears repeating: **learn to "see intentionally", rather than passively**.

I found this "pretty". Overall, the camera did not.

I found this kind of ugly - but thought that the camera might love it.

I have met no one in Brockville who recognizes this, yet it sits out in the open, on a well-travelled street. It simply does not draw the eye.
But it drew the camera.

While you're here:

Remember that I make photographs and that I sell photographs.

Almost everything which you see on this web site is for sale. Prices at the time of writing, for example, for an 11x14" fine-art print with a generous white border would be about $40, and you can go up or down from there. Check the rates page. More importantly, check out my gallery.

Book a portrait-sitting - the right frequency with which to commission formal portraits is a bit more often.

Remember also to leave a comment, or to contact me. Note that on the main blog page you can sign up for new-blog notifications. I am very careful and respectful with your privacy.

Thank you so much for reading.

Charles T. Low
Photographer

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