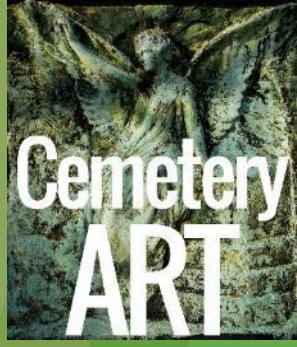


Infrared Workshop

By Bob Vishneski

June 17, 2024

"What we observe is not nature itself, but nature exposed to our method of questioning."

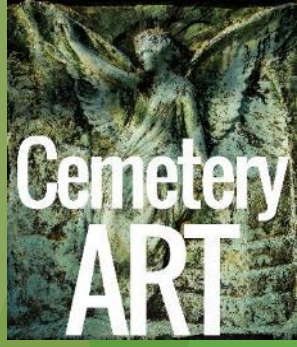
— Werner Heisenberg, Physics and Philosophy

Agenda

- Expectations
- Camera Considerations
- Preparing to Shoot
- Filter Considerations
- Camera Profiles
- Workflow
  - Presets and Reference Images
  - The Channel Mixer – A touch of magic…
  - B&W Conversion & Overlays
- Other Infrared Processing Possibilities

"Ah! If we had other senses which would work other miracles for us, how many more things would we not discover around us!"

— Guy de Maupassant

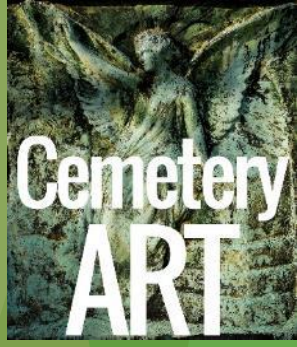


Expectations

- What You Will Learn
  - Basic understanding of concepts affecting the processing of infrared photos
  - Software programs and tools used in infrared post-processing
  - The opportunities and challenges associated with different types of infrared filters
  - Nuances of processing and Photoshop tools that can make significant differences in your final results
  - “A” method, not “The” method
- What You Will Not Learn
  - How to be become an expert after one session

“An expert is someone who knows some of the worst mistakes that can be made in his subject, and how to avoid them.”

— Werner Heisenberg

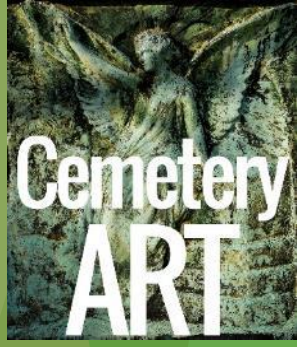


Camera Considerations

"To them, equipment failure is terrifying. To me, it's 'Tuesday.'"

— Andy Weir (The Martian)

Mirrorless



- Pros
  - ***WYSIWYG — Can view IR image in the Electronic View Finder (EVF)***
  - ***EVF allows much more flexibility relative to conversion options and filters***
  - Less moving parts so mean-time-to-failure should be better than DSLRs
  - Closer lens flange-to-sensor allows for less distortion and sharper images, especially toward edges
  - Wave of the future
  - Smaller & lighter, although not as much as hyped
- Cons
  - Command a premium price, but coming down
  - Lens selections somewhat limited depending on brand, but improving
  - External filters can get expensive depending on the size and number of your lenses
  - Battery life improving but still ~1/3-1/4th of DSLR technology

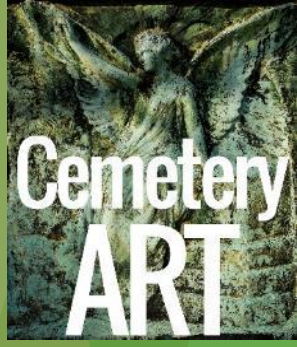
Smartphones

Infrared Flashlight – What I saw

Infrared Flashlight – What smartphone saw

Taken by holding infrared filter over smartphone lens

https://www.cemeteryart.net/getting-started-with-infrared-photography



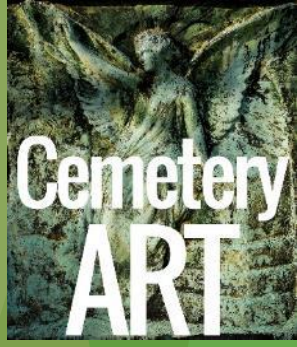
Preparation

"Only someone who is well prepared has the opportunity to improvise."

— Ingmar Bergman

Getting Ready To Shoot in Infrared

- Lenses – Ensure you use lenses with good infrared ratings and/or avoid the weak spots per lens
- Check with Infrared Conversion Companies for suitable lenses and “safe” apertures
- You can create a custom white balance for your camera, but it is not necessary
- Test your camera’s metering system to determine how it behaves in sunny, cloudy, and shady conditions
- Metering/Exposure
  - Know where to find and how to adjust your Exposure Compensation setting, as, depending on your camera, you may have to make occasional changes
  - Reminder – cameras’ metering systems are designed for visible light – not infrared
  - Metering issues will often be exacerbated with infrared light

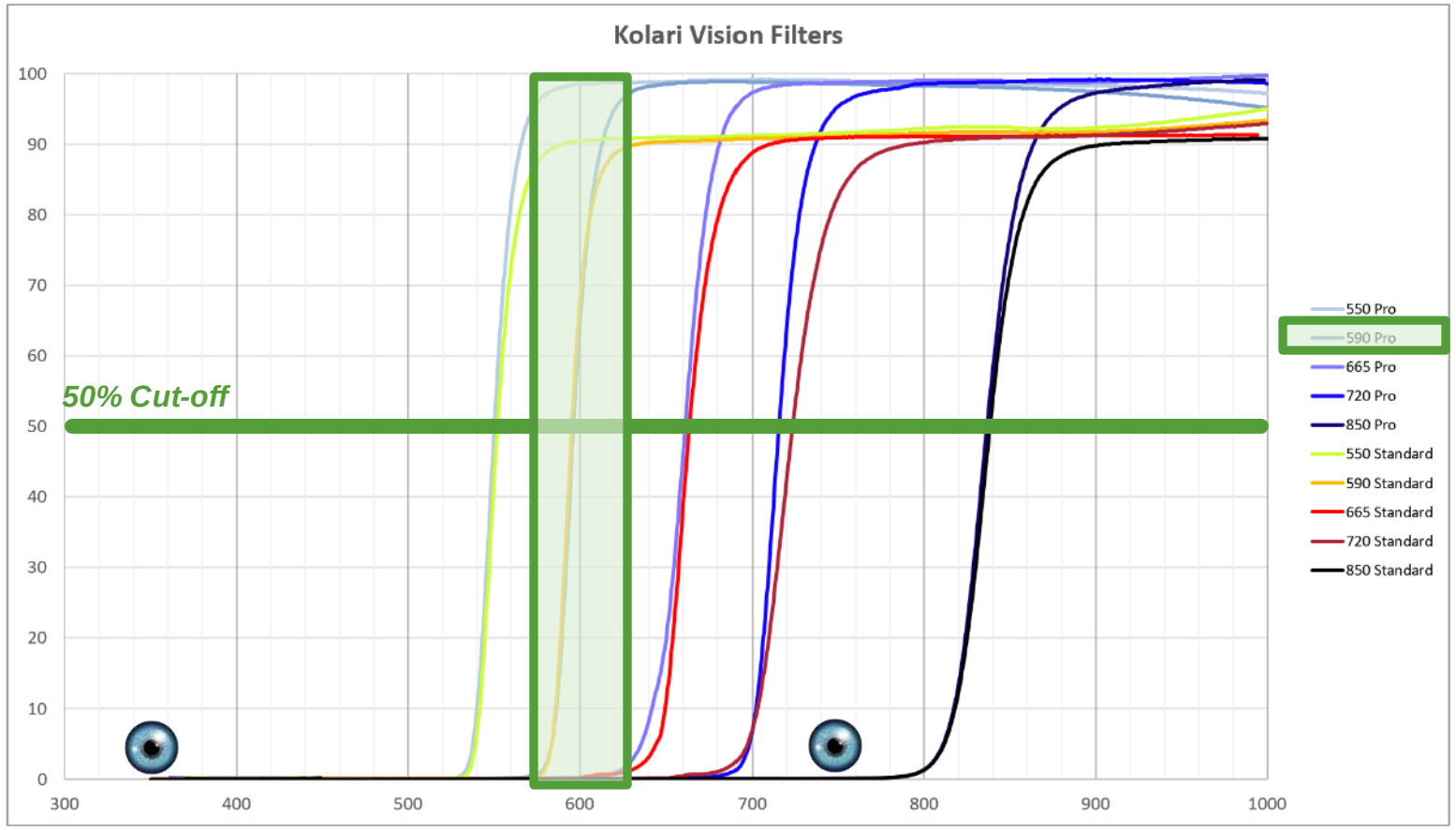


Filter Considerations

"Beauty is no quality in things themselves: It exists merely in the mind which contemplates them; and each mind perceives a different beauty."

— David Hume

Infrared Filters – Named by Cut-Off %



More Visible Light ⟵ ⟶ More Infrared Light

Examples of Infrared Filters and Effects
(courtesy of Kolari Vision)

https://kolarivision.com/articles/choosing-a-filter/

"We all see the same thing, but interpretive it differently."

— Sukant Ratnakar

Shooting Conditions

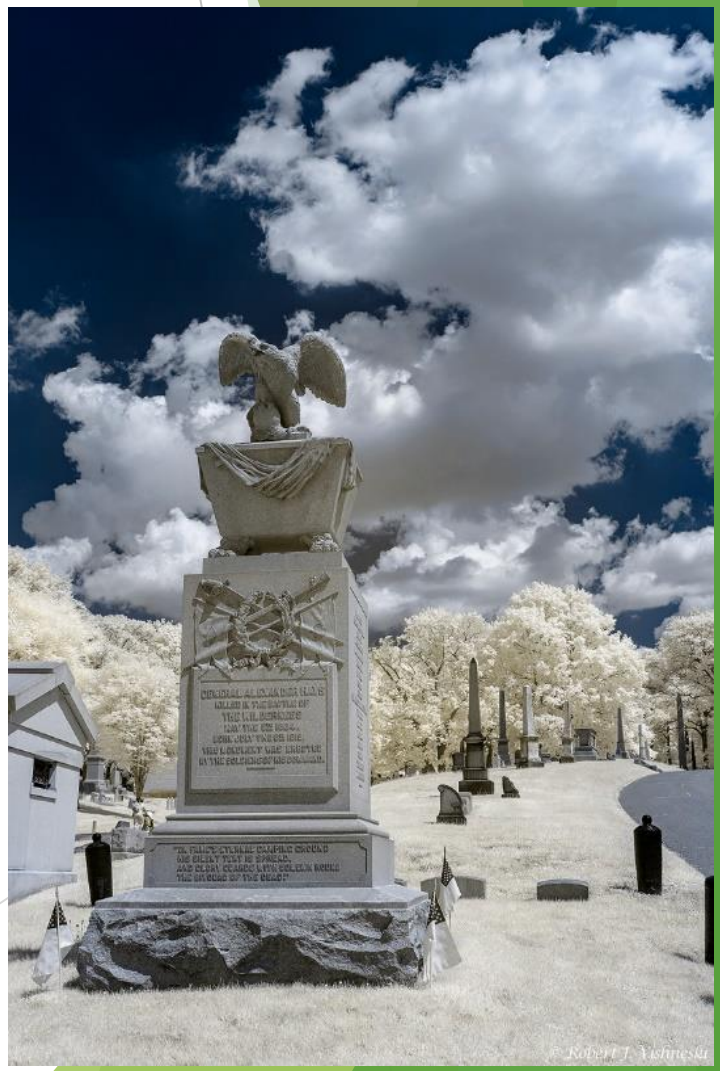
"All that we see or seem is but a dream within a dream."

— Edgar Allan Poe

- Bright Sunny Days
  - “Dog Days” of Summer
  - ***All Filter Wavelengths***
  - 550/590nm – Good color separation
  - 720nm – Good color separation between Yellow & Blue
  - 850nm – Vegetation at its best (no false color opportunities)
- Cloudy Days
  - ***550/590nm – Good for capturing diverse colors***
  - 720nm – Not much color separation between Yellow & Blue
  - 850nm – Noise levels will increase significantly (no false color opportunities)

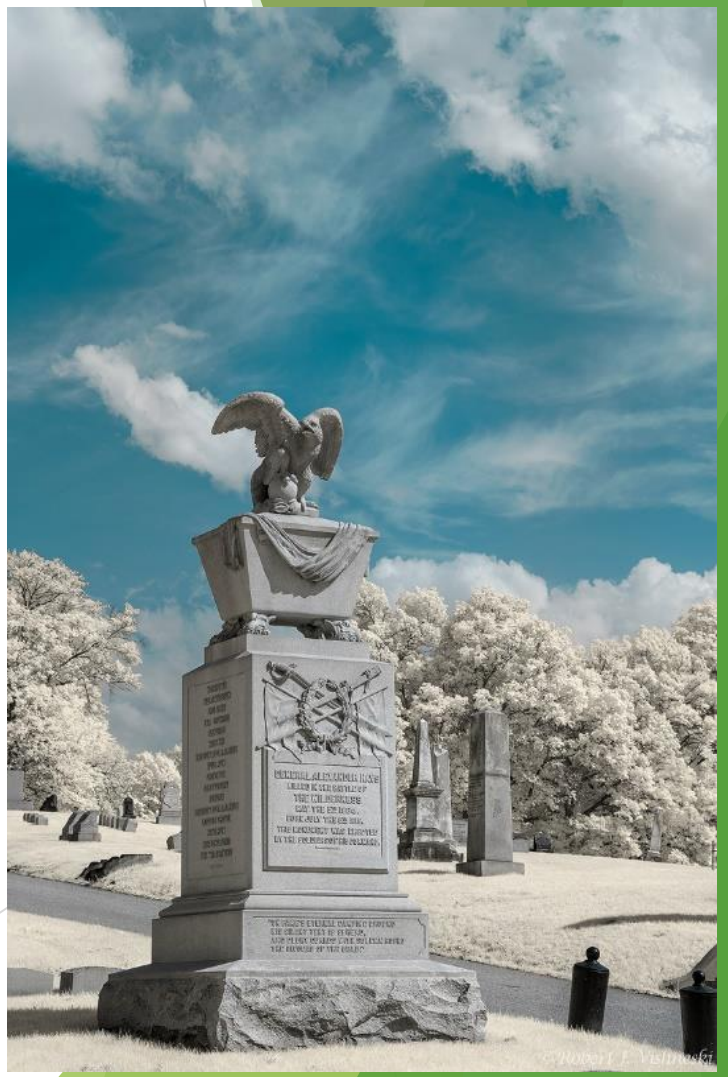
Infrared Light & Camera Sensors

- Filter choice – matter of taste and post-processing skills
- There are no “standards” for infrared filters
- The longer the wavelength (nanometers — nm)
  - More infrared light and less visible light
  - Brighter the foliage
  - Less “false colors” options
  - Higher the ISO required (sensors not designed for infrared light)
  - Lens hotspots are more apparent
  - The less atmospheric haze you will observe/capture
  - Will show veins under the skin not visible in visible light
  - ***Less opportunities in winter (lack of lush vegetation showcasing infrared light)***



Infrared Light & Camera Sensors

- The shorter the wavelength (nanometers — nm)
  - Less infrared light and more visible light
  - Foliage appears more colorful
  - Less opportunities to replicate that infrared “pop” of longer nm filters
  - Lower the ISO required (more visible light)
  - Fewer problems with lens hotspots
  - More complimentary to skin
  - ***More opportunities to shoot in winter – Evergreens show good color***



What Influences Your Infrared Photo

Mix & Quality of:

Visible Light

Infrared Light

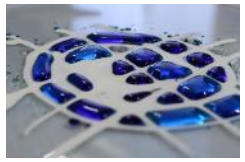
Material

Trees & Vegetation

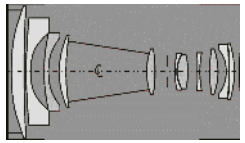
Material

Infrared Filter Used

Lens



Lens Coating Material



Lens Design

Paint & Coatings Inside Lens

F-stop

File Type

RAW

JPG

Sensor

Sensitivity to Infrared Light

How it interprets Infrared Light

Camera Processing Engine

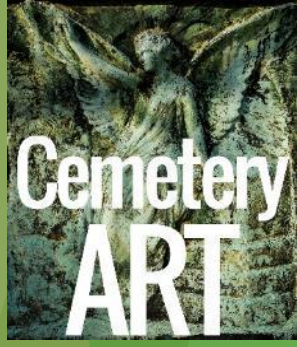
Nikon Ex Speed

Canon DIGIC

Sony BIONZ

"Shallow men believe in luck or in circumstance. Strong men believe in cause and effect."

— Ralph Waldo Emerson

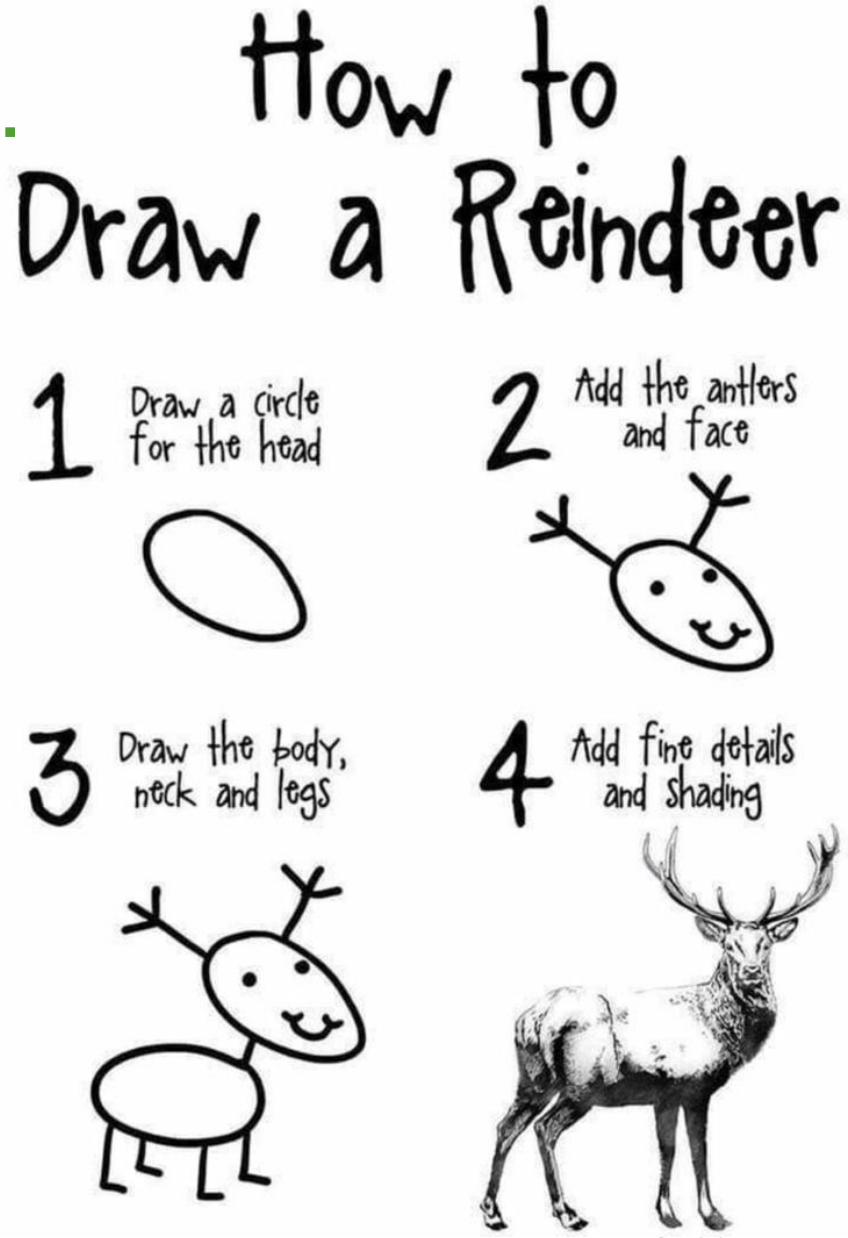


Workflow

"Nothing is ever as simple as it seems. At the edge of perception, weird things dance and howl."

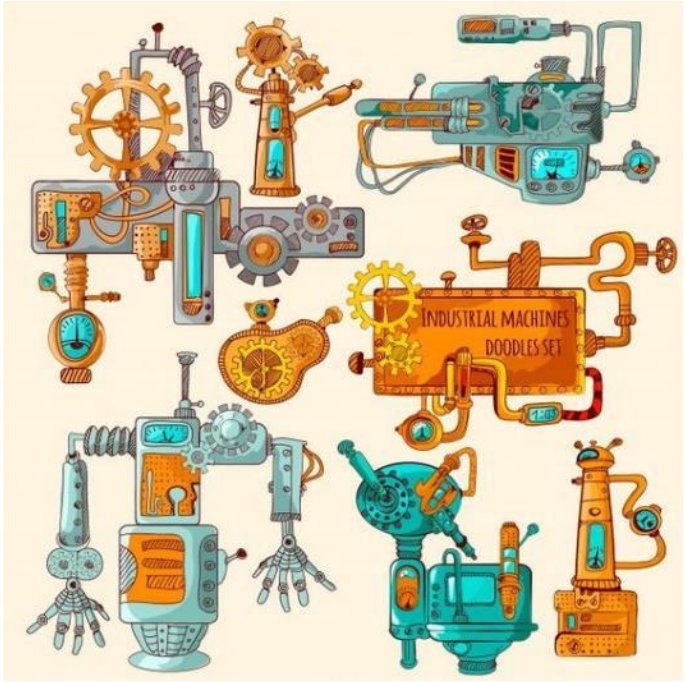
— M.H. Boroson, The Girl with Ghost Eyes

Infrared Processing…



"Every strike brings me closer to the next home run."

— Babe Ruth



$10,000 INVOICE

Tapping with Hammer - $2
Knowing Where To Tap - $9,998

The Good, The Bad & The Ugly…

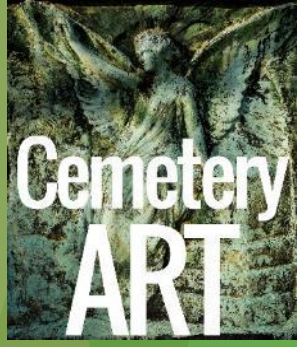
- The Good…
  - So much more information and resources available than in prior years
  - Digital camera costs continue to fall and capabilities are improving
  - With the number of photos taken per year exploding, infrared offers a way to provide something unique
- The Bad
  - Despite the above, infrared processing can be challenging
  - Different lighting and other factors can require changes to your workflow
  - Settings that worked fine for one environment don't always transfer to the next
- The Ugly
  - Changing more than one parameter in the workflow can lead to confusion about cause & effect
  - A lack of patience can aggravate the challenges of developing a good workflow and getting consistent results

Tools

- White Balance Card
- Lightroom
- DNG Camera Profile Editor
- Lightroom
  - Basic Pre-Processing
  - Presets
- Photoshop
  - Channel Mixer
  - Hue/Saturation
  - B&W Layer (Opacity – Luminosity)
  - Curves Adjustments
- A Bit of Magic and some luck
- Boatloads of Patience & Persistence

"Knowledge is a tool, and like all tools, its impact is in the hands of the user."

— Dan Brown



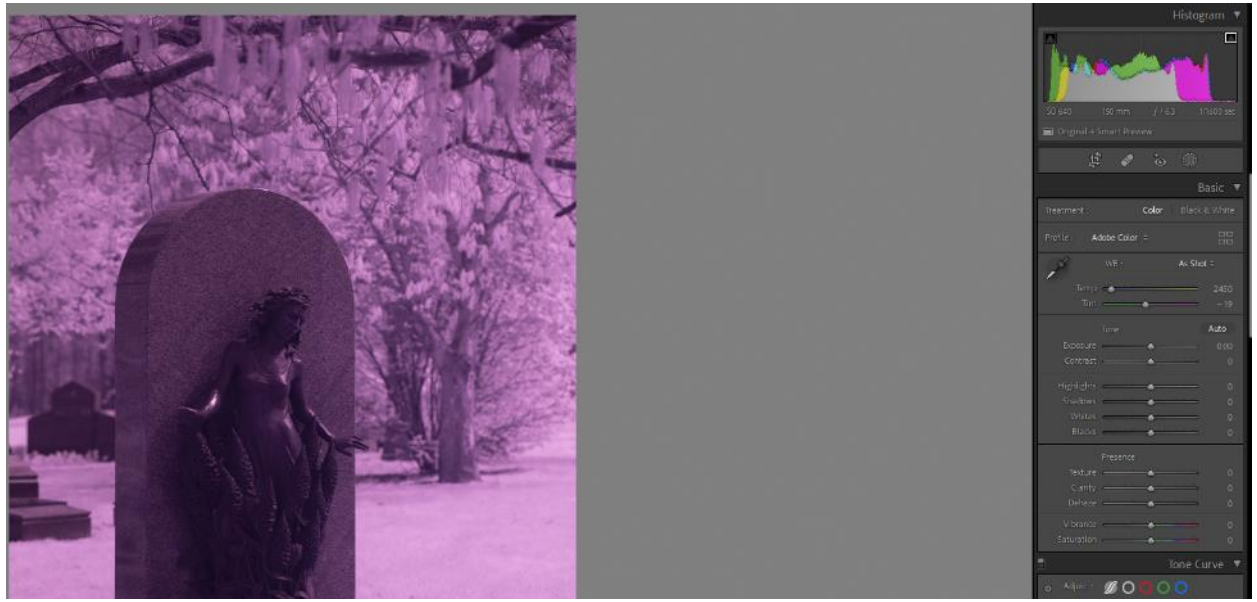
Always in Wallet

Always in Camera Bag

Handy if Available

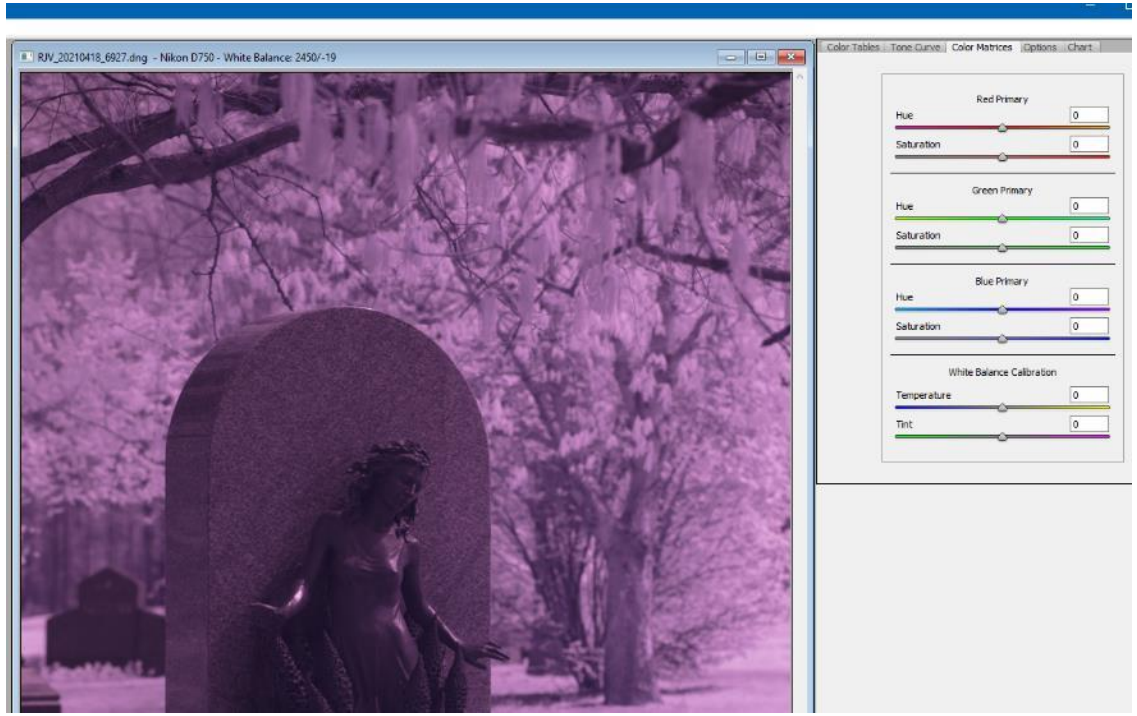
Opening Up White Balance Scale

- Lightroom/Camera Raw do not natively handle infrared files well – Limit the White Balance and Tint options
- Need to Create a Custom Camera Profile for infrared that will provide more latitude during post-processing
- What Lightroom “sees” of a 720nm infrared image

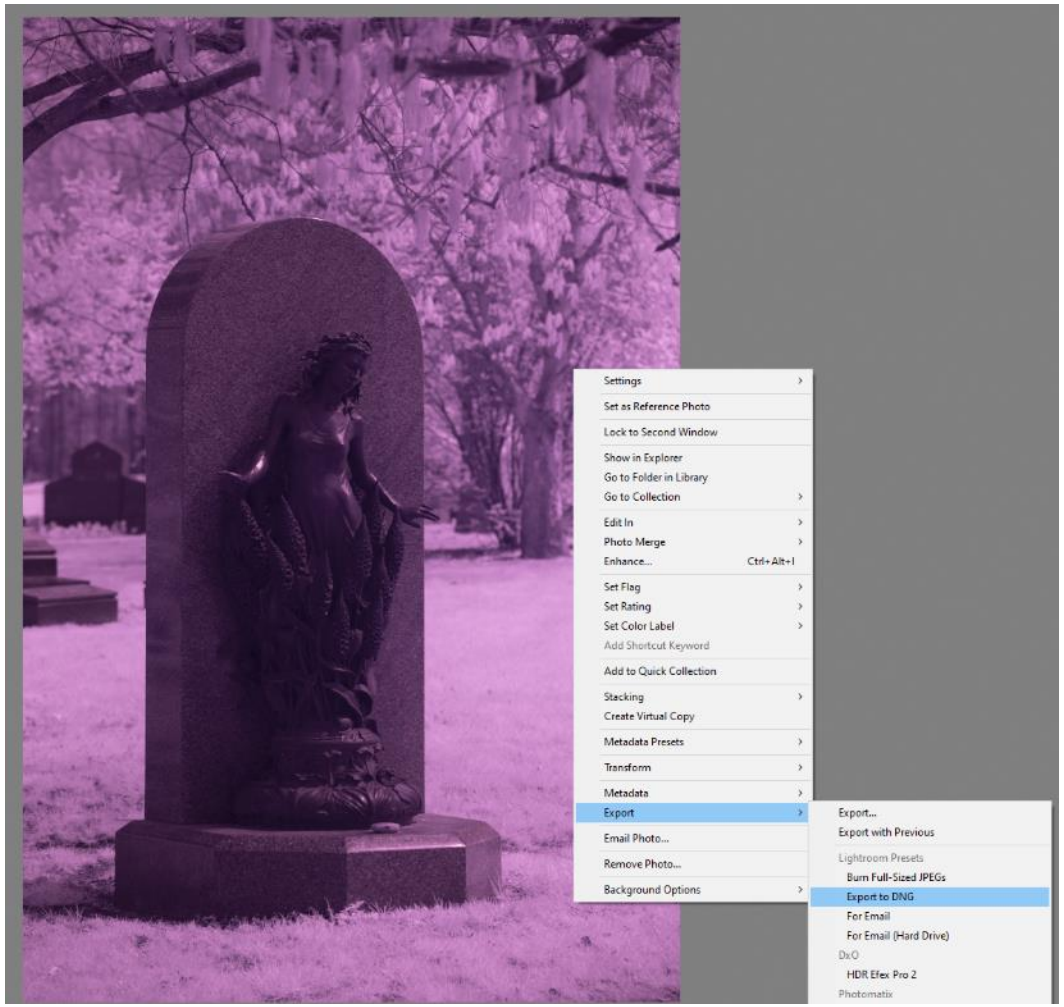


Modify White Balance of DNG File

- Where to find DNG Profile Editor Tool
  - https://helpx.adobe.com/camera-raw/digital-negative.html#resources
- Where to find DNG Profile Editor Tool Tutorial
  - https://www.youtube.com/watch?v=wP3zsdSOadU

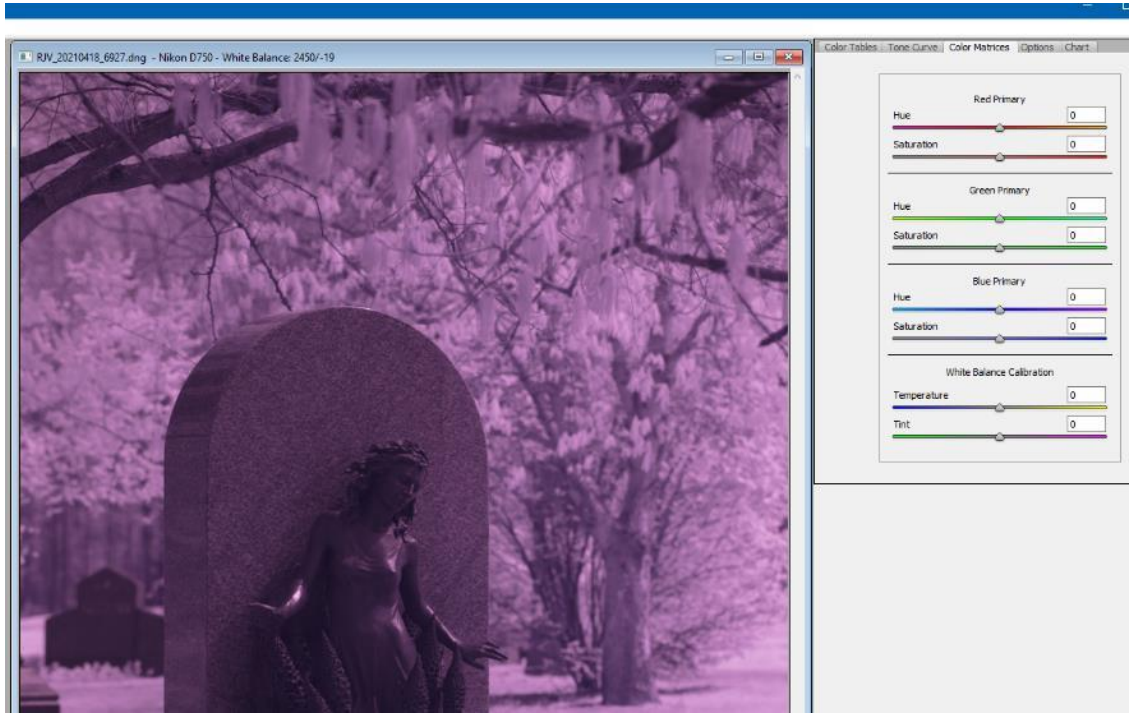


Export DNG Version of File



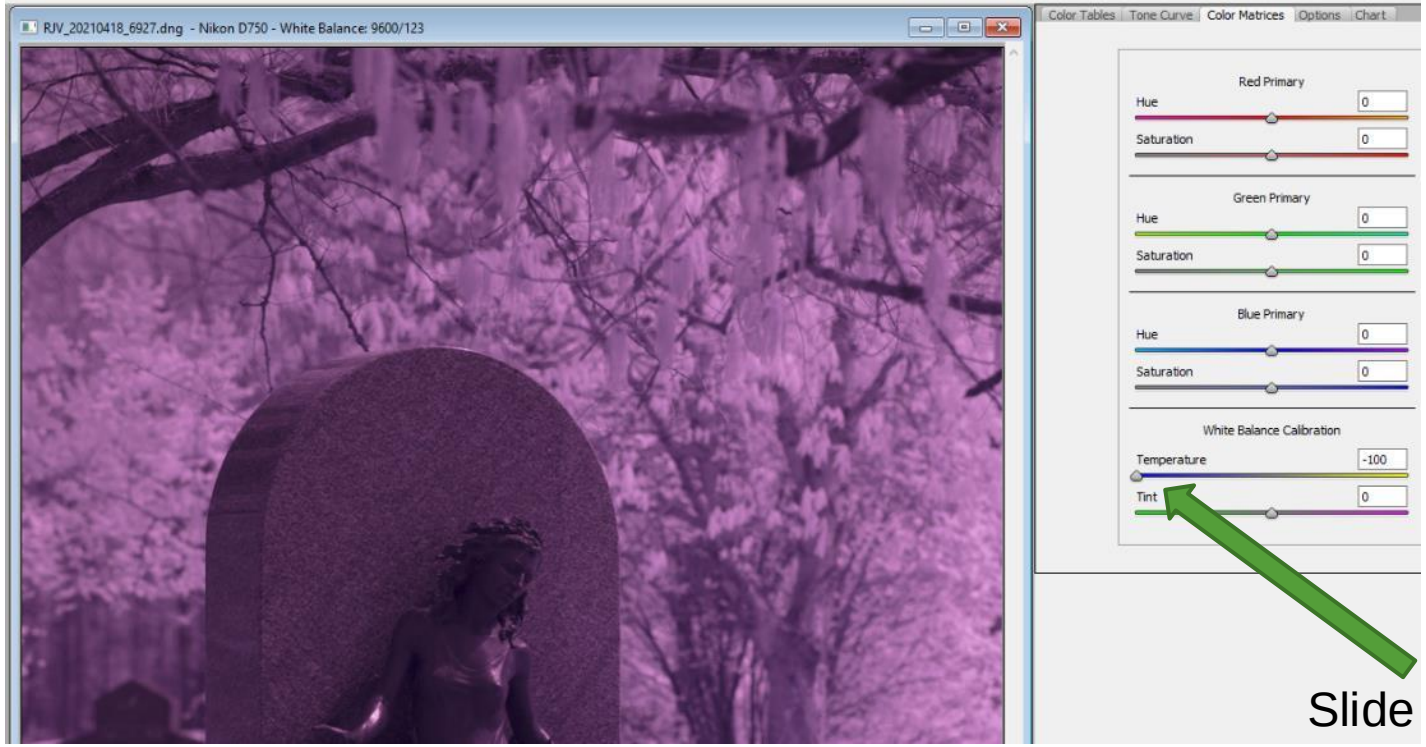
Process

- Open DNG Profile Editor
- Open DNG File you previously saved



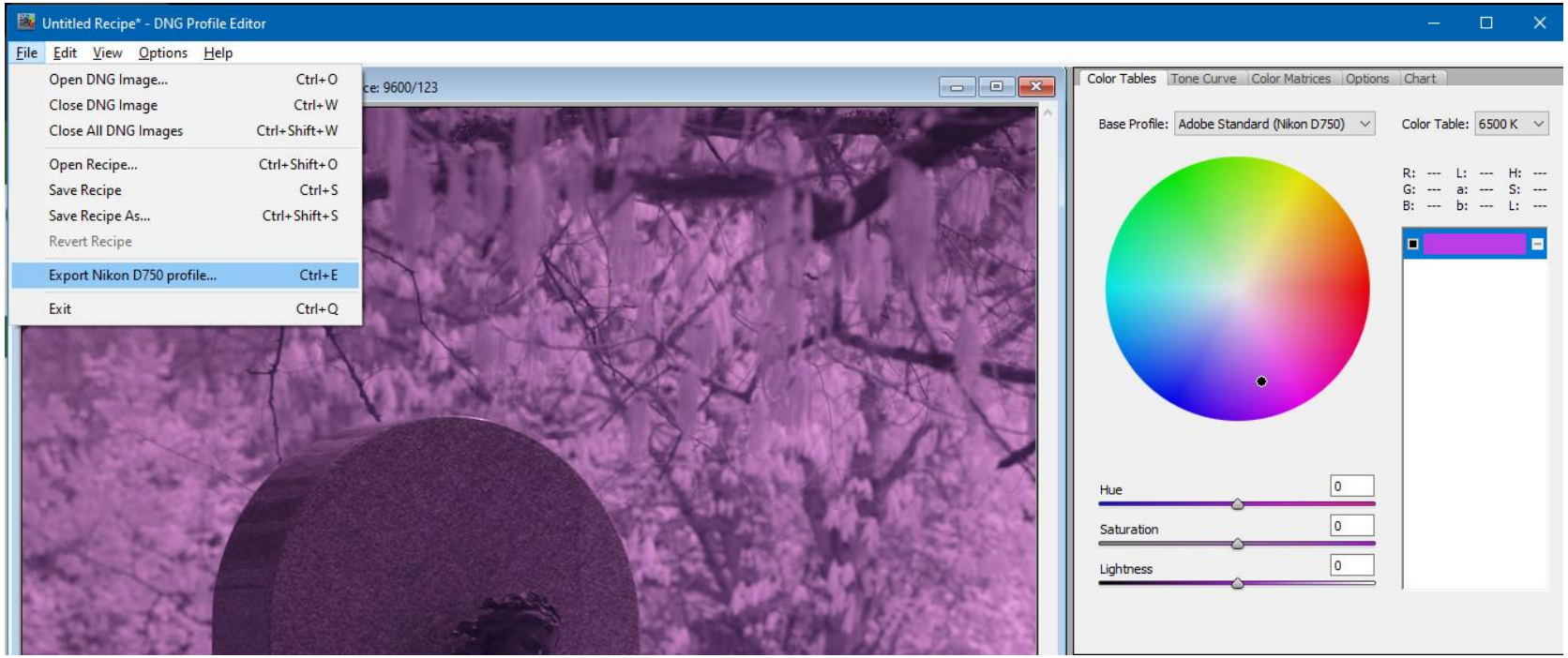
Process

- Adjust White Balanced to -100



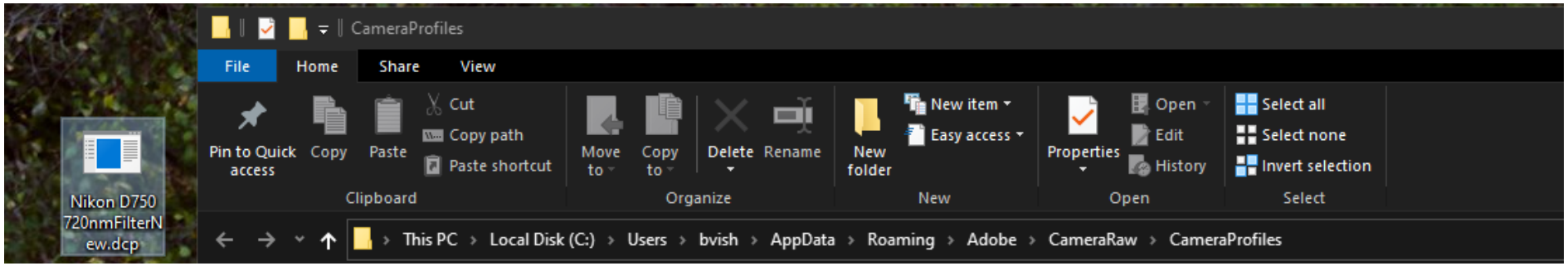
Process

- Export profile



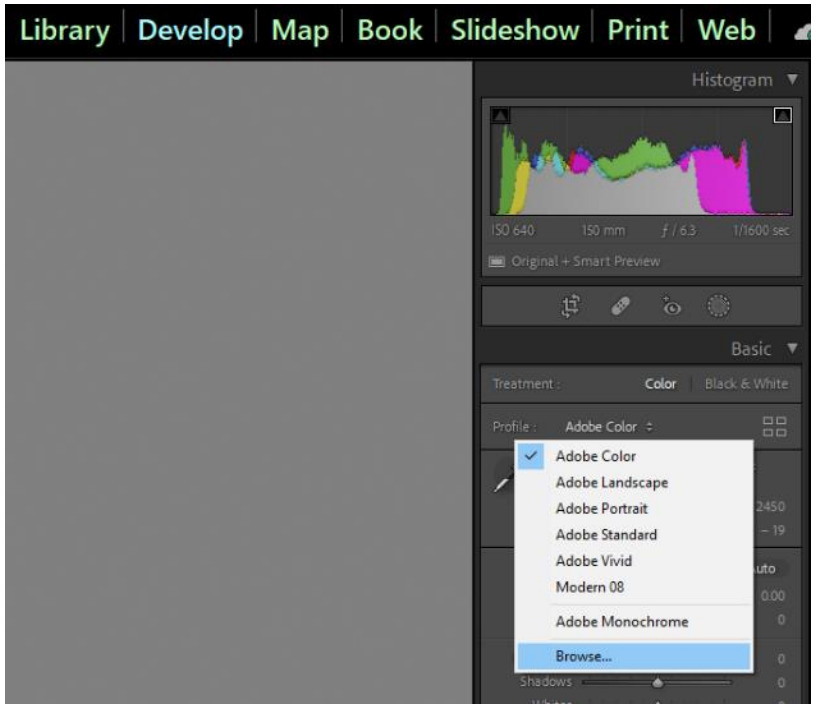
Process

- Save in Camera Raw/Camera Profiles' folder on your PC or Mac
- Restart Lightroom

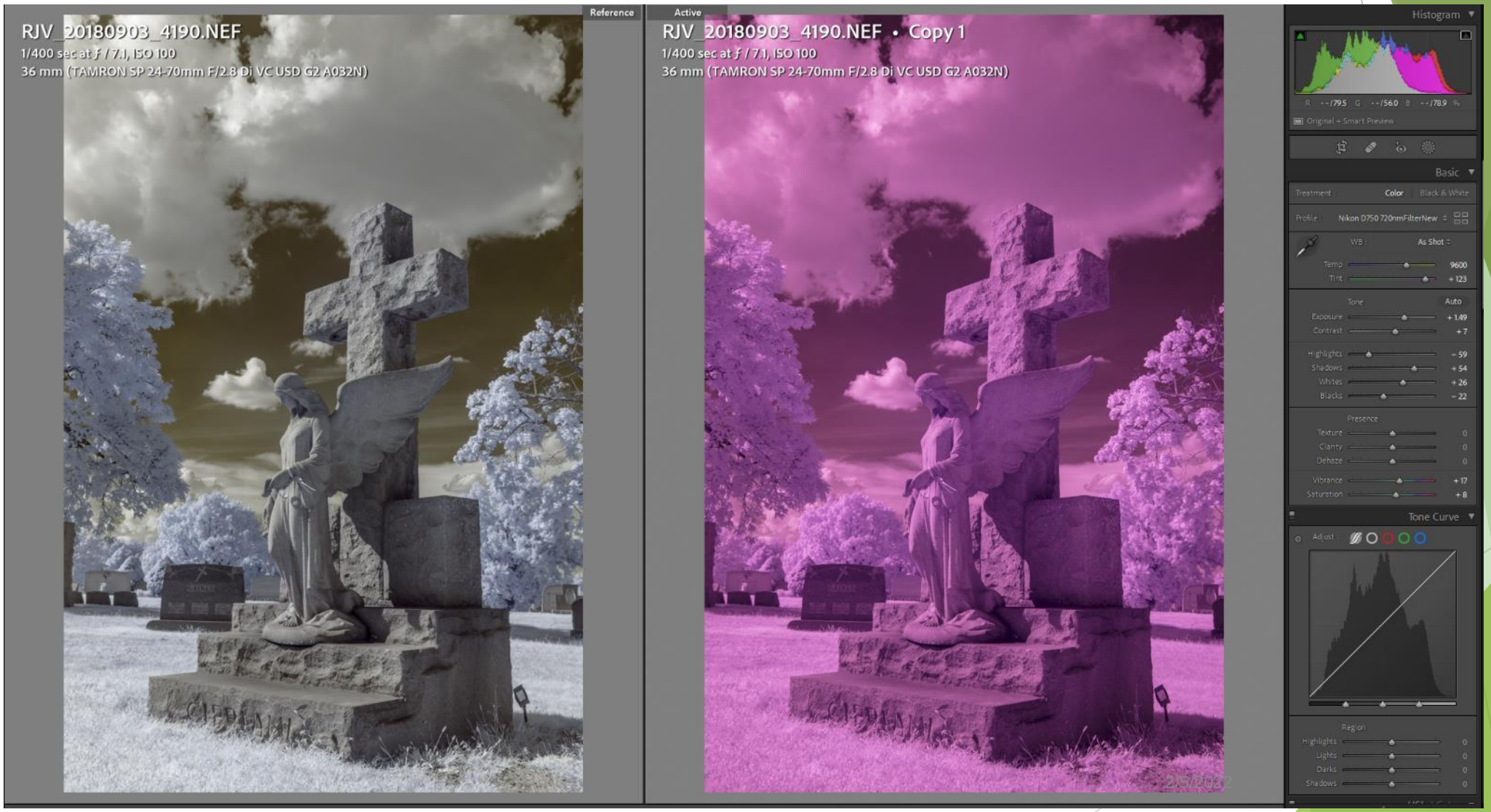


Process

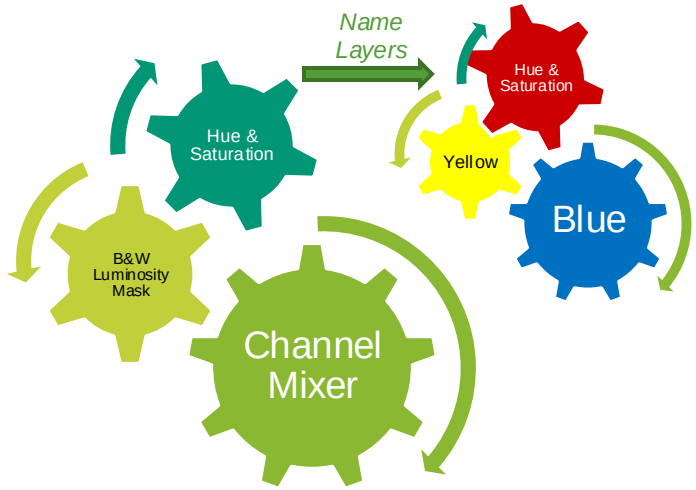
- Open your infrared image
- Find and select the Camera Profile just created



After / Before Custom Profile Creation *(and preset)*



Workflow



RAW *or JPG*

Get It Right In Camera

Adobe Camera RAW

Adobe Lightroom

Native Nikon, Canon, Sony, etc. Application

Library of Presets

Adobe Photoshop

Save Settings Into Folders

Red Leaves Aqua Sky

Yellow Leaves Blue Sky

Lavender Leaves Aqua Sky

Orange Leaves Green Sky

Base Image

Final Image

Drag & Drop Onto New Images

RAW → Exposure → Pre-Processing → Presets → Develop & Save Settings → Reuse & Adjust

Workflow

- 720nm
- 550nm (similar to 590nm)
- 850nm
- Submitted photos

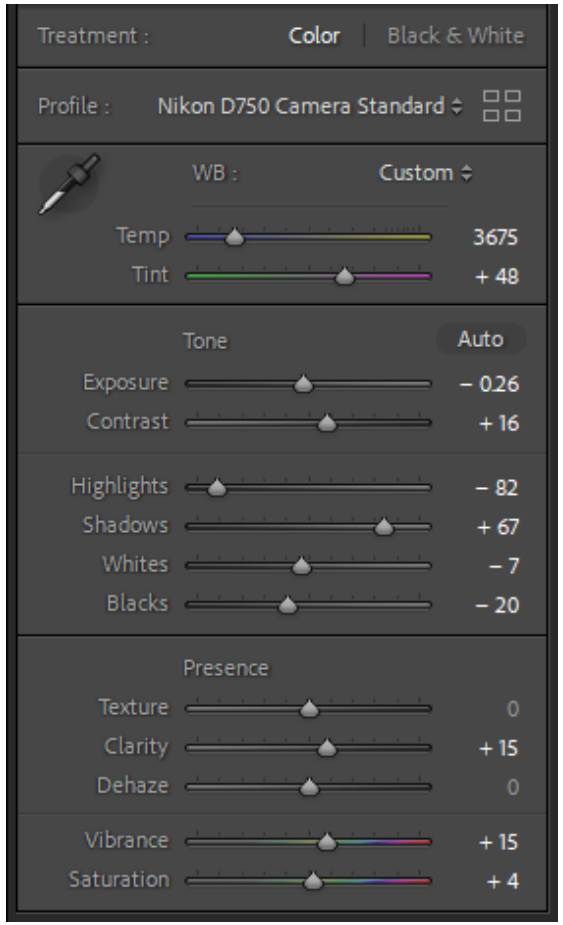
“Revelations are found in clouds.”

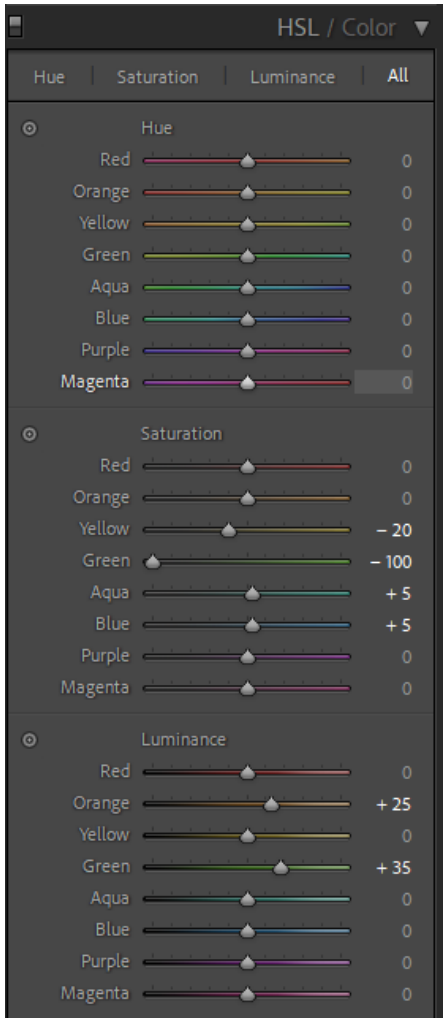
— Serge King

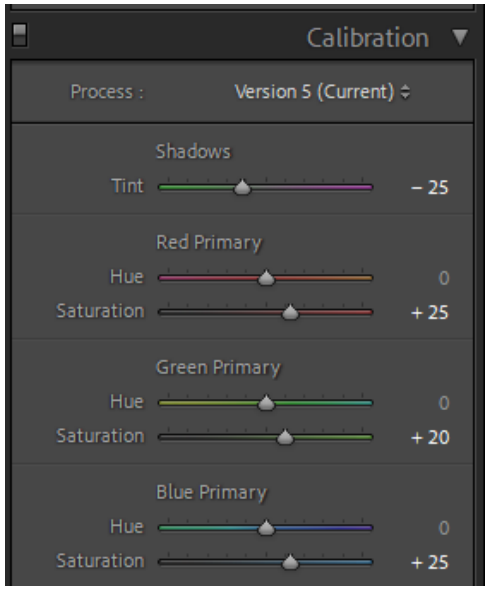
“Clouds are the keys to good infrared photos.”

— Bob Vishneski

Post-Processing – Lightroom Settings – 720nm

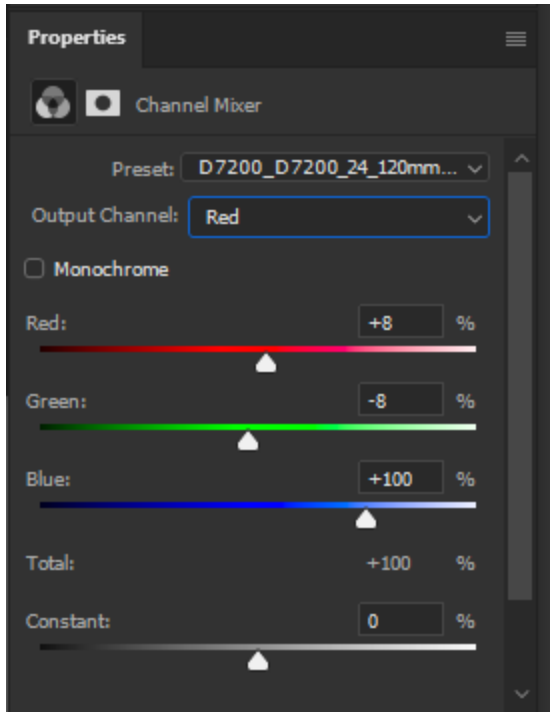


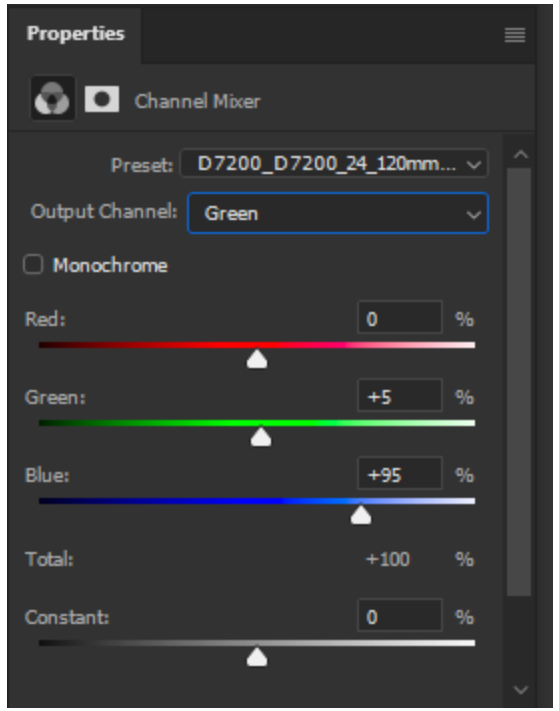


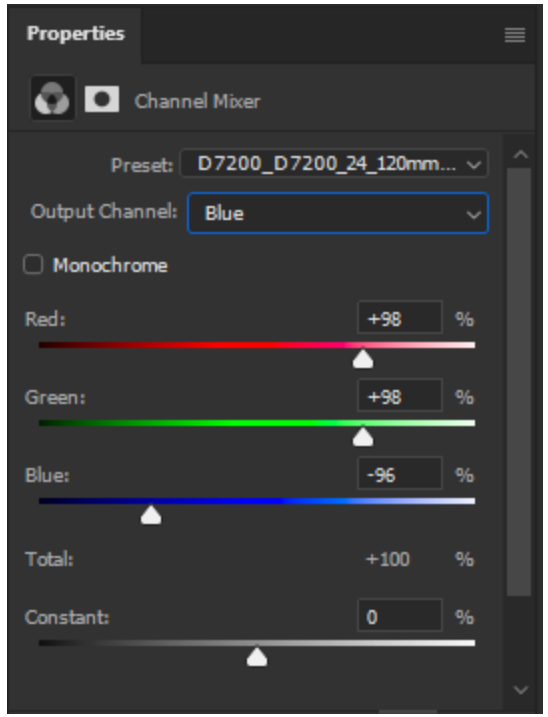


"Create your own style… let it be unique for yourself and yet identifiable for others."
— Anna Wintour

Alternative Channel Mixer Settings – 720nm



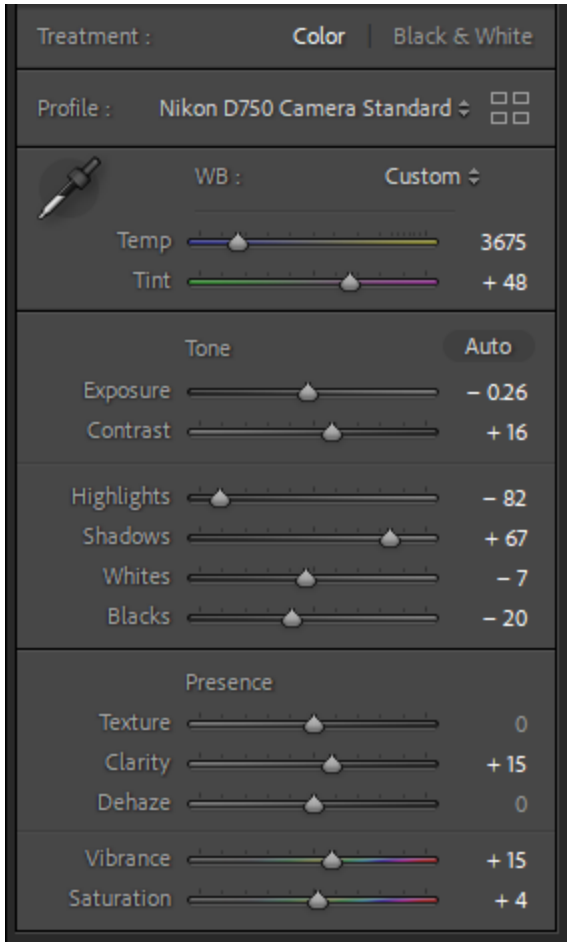


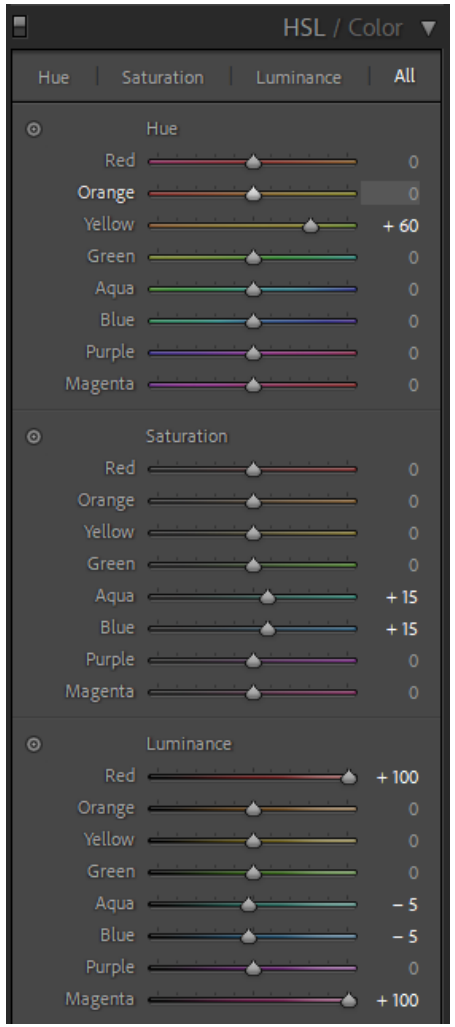


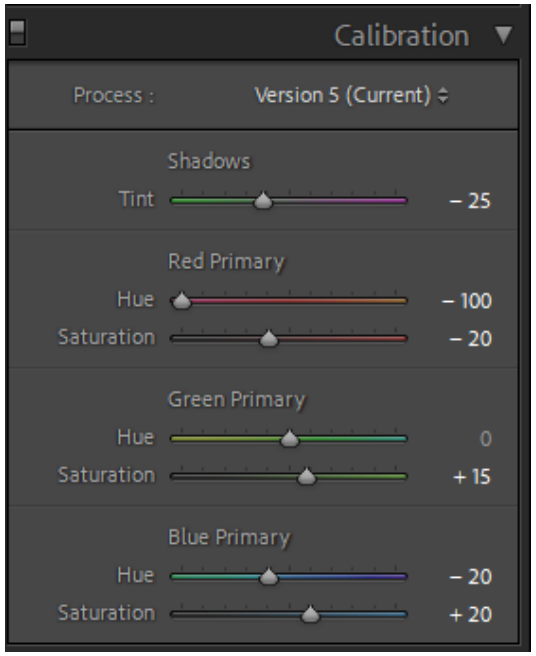
"Just tell me how to be different in a way that makes sense."

— Stephen Chbosky

Post-Processing – Lightroom Settings – 550nm



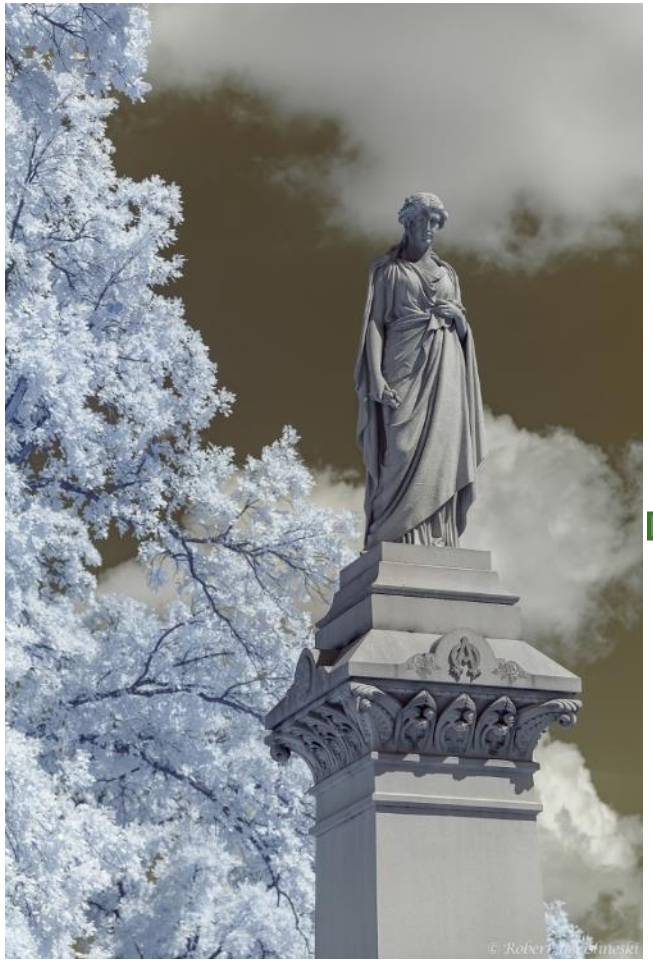




"Thank goodness I was never sent to school; it would have rubbed off some of the originality."

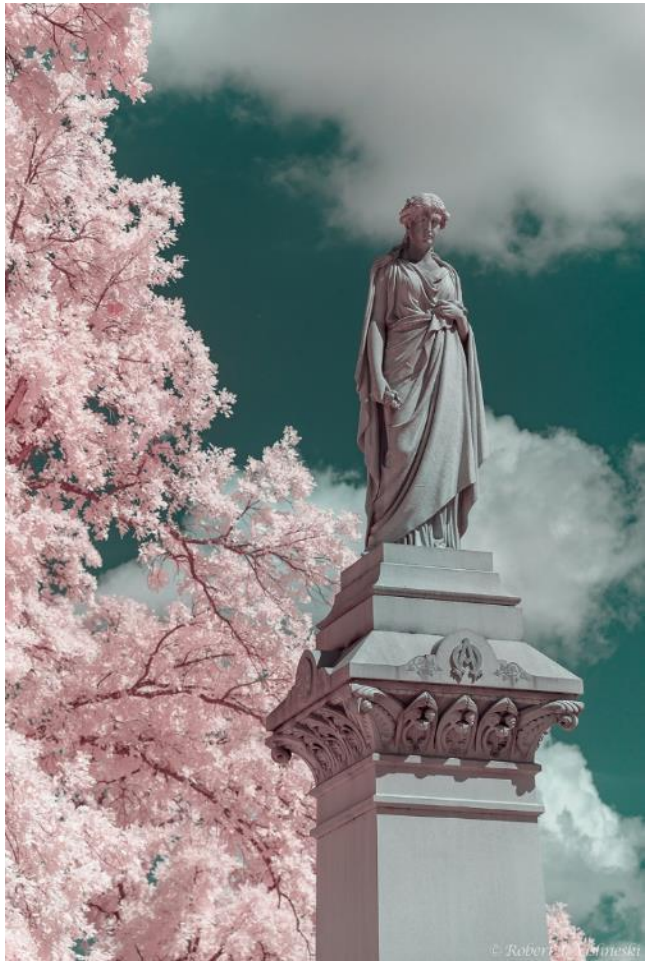
— Beatrix Potter

Post-Processing – 720nm Standard Method

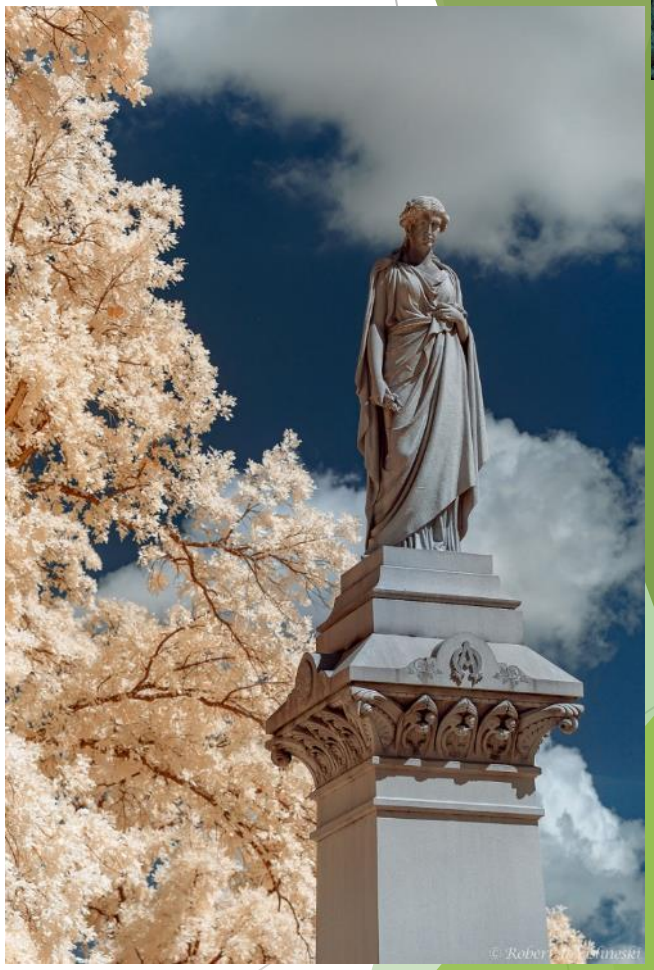


Base

Using Standard 720nm Infrared Channel Swap Method
Red-to-Blue
Blue-to-Red



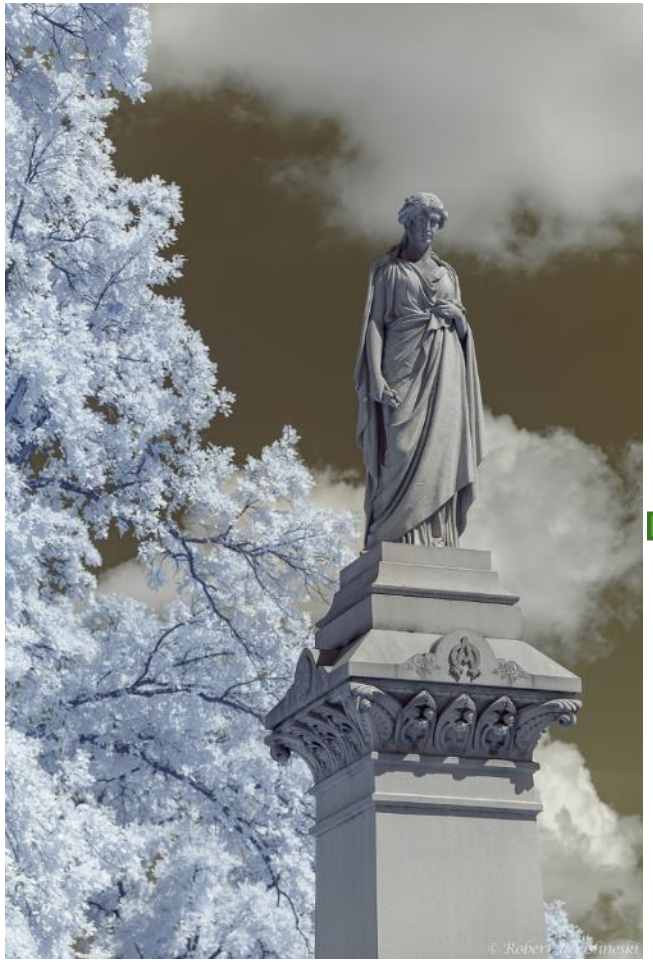
After Standard Channel Swap



Final Image

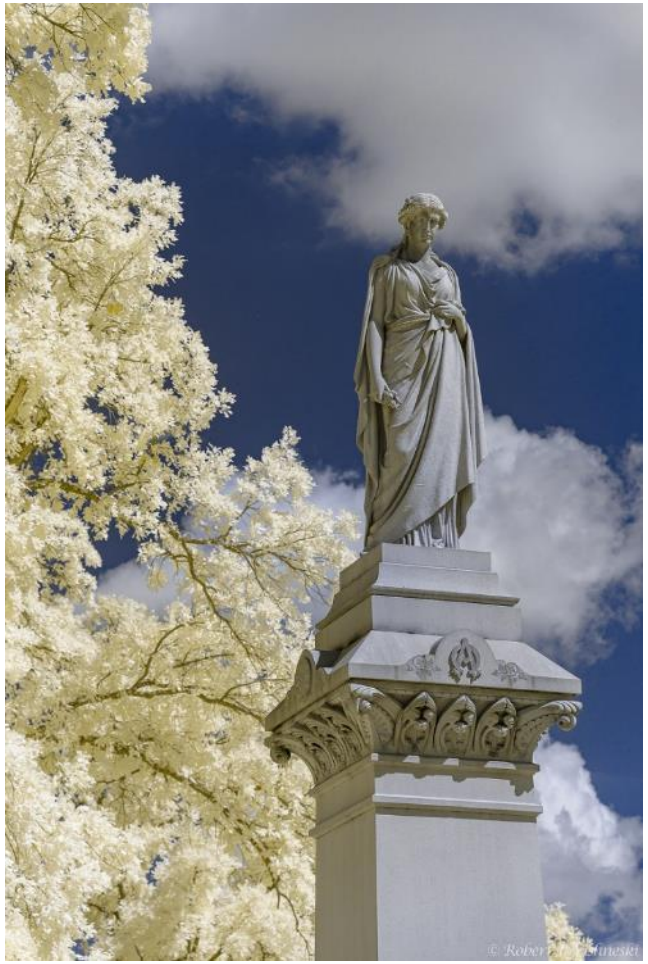
"We can not solve our problems with the same level of thinking that created them."
— Albert Einstein

Post-Processing – 720nm – My Method

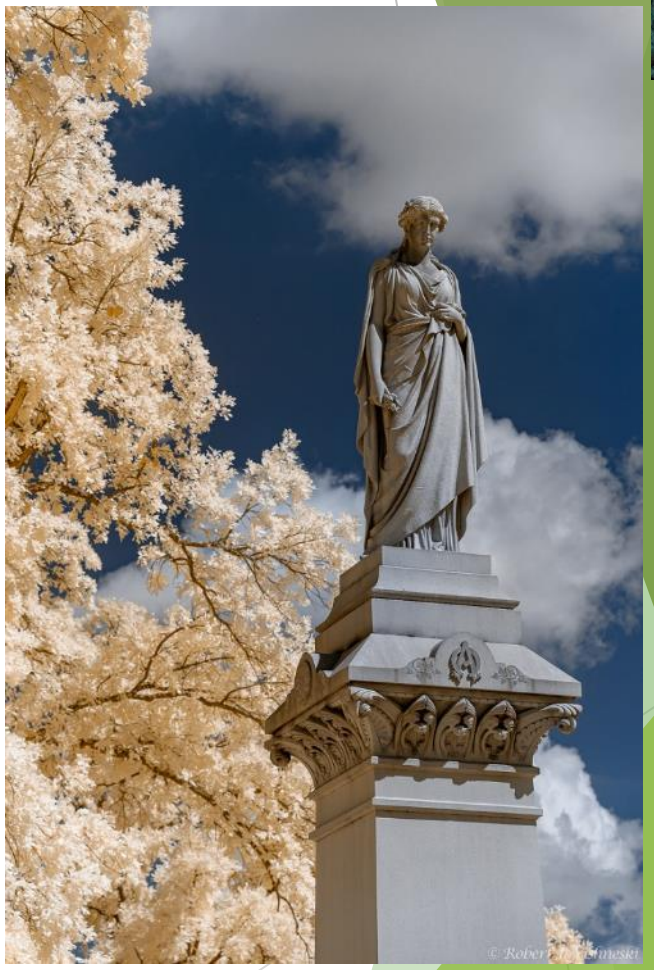


Base

Using Standard 720nm Infrared Channel Swap Method
Red-to-Blue
Blue-to-Red



After My Channel Swap



Final Image

"Results are obtained by exploiting opportunities, not by solving problems."
— Peter F. Drucker

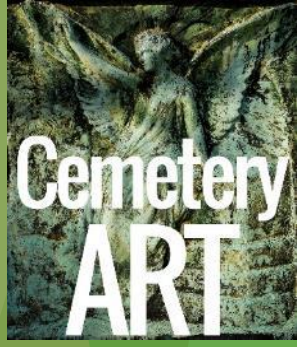
"Where you end up is a function of where you start."

— Bob Vishneski

Post-Processing Recap

- Shoot RAW – most flexibility with respect to post-processing and quality options
- You can use native OEM software (such as Nikon NX) to set white balance from RAW
- Recommend Adobe Lightroom & Photoshop Creative Cloud — $9.99/month
- White Balance — Critical aspect of process
  - Camera Raw and Lightroom limit White Balance (2000) & Tint (150) scale
  - Solution: Create a custom camera profile
  - Download Adobe DNG Color Profile Editor (https://helpx.adobe.com/camera-raw/digital-negative.html)
  - Process found here: https://www.youtube.com/watch?v=wP3zsdSOadU
  - This significantly broadens the scale of the White Balance & Tint settings, allowing you to get the best possible results

Thoughts & Recommendations



- Begin by converting an older DSLR if you have one
- Join some of the Facebook infrared groups and study the images
- You will quickly see some of the challenges many face in post-processing
- White Balance & Tint form the foundation of where you can take an image and how much you can adjust it
- Small differences in Tint can make a huge impact on colors
- Your clouds should be close to white in base image (in Lightroom, Camera Raw, Nikon NX, etc.) before post-processing in Photoshop
- Many-to-many relationships between various settings, starting with White Balance & Tint — Need to change one at a time
- It takes some time, practice, and experimentation to develop an understanding of the many post-processing components and their interaction with one another

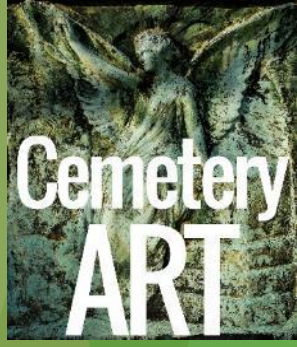
Thoughts & Recommendations

- Begin with some of the Conversion Companies' actions for Channel Swapping
- Save Presets for your base images per filter in Lightroom
- Save Reference Images in Photoshop
  - Images that achieve certain looks/effects you wish to replicate
  - Drag and drop the layers/folders from Reference Images onto new photos
  - This often gets you 95+% of the results, with only minor tweaks required
- Practice making small changes in Lightroom and then apply your Reference Image settings to determine the effect

"Rinse and repeat."

- Experiment, experiment, experiment…
- Have patience with yourself

Thoughts & Recommendations



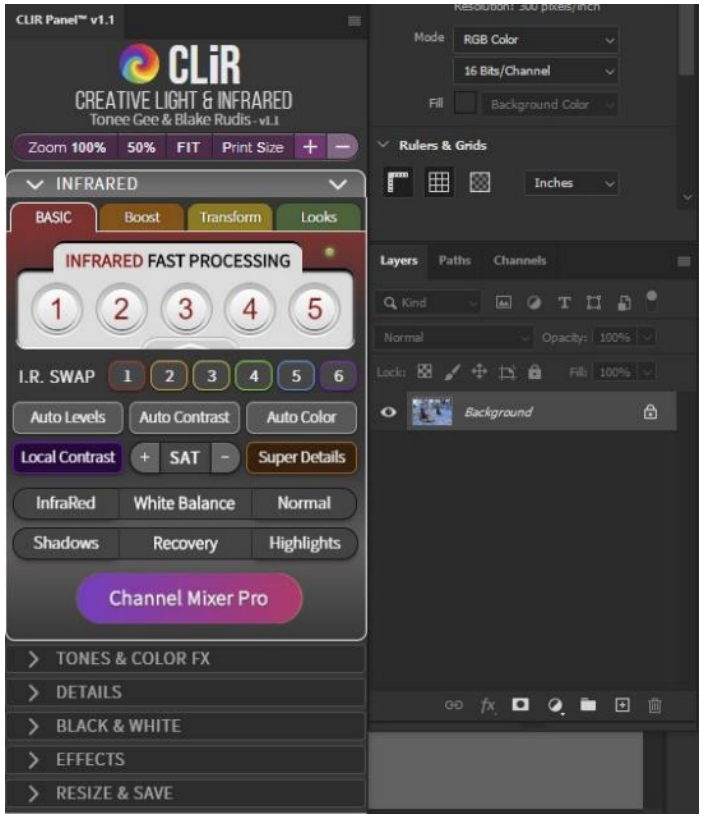
- “Pushing colors around” in Photoshop can cause problems
  - Color noise
  - Banding & blotches — discontinuous blue/cyan tones in skies
  - “Orphan pixels” — parts of the image no Hue/Saturation slider will affect
- Zoom in to observe the image details when making changes
- Invest in a good denoising and sharpness tools — Topaz’s AI tools provide excellent results and value

“There is no easy way from the earth to the stars.”

— Seneca

CLiR – Photoshop Plugin

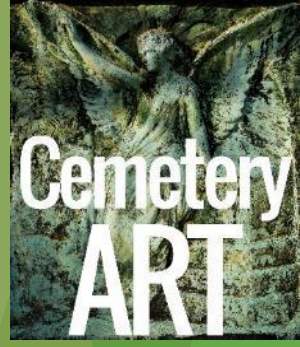
- Tool developed based on acknowledgment of infrared post-processing frustrations
- Photoshop plugin - panel of pre-configured commonly used infrared settings
  - Channel Mixer
  - Hue/Saturation
  - Curves
  - Other post-processing settings
- ~$200 (often discounted to $160)
- https://f64elite.com/ir-mastery/



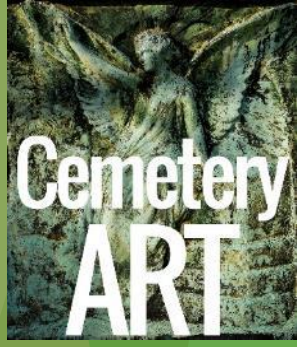
Summary

"The universe is full of magic things, patiently waiting for our senses to grow sharper."

— Eden Phillpotts, A Shadow Passes



- Infrared light offers an opportunity to explore a unique aspect of photography
- Allows you to capture the world in a different manner
- Many more sources of information than in years past
  - Conversion companies
  - Websites & social media
  - Lens hotspot databases
  - Photoshop actions
  - Video tutorials
- There's an infrared solution for every budget
- In time… you may begin to see the visible world in infrared light



Q&A

"The eye sees only what the mind is prepared to comprehend."

— Robertson Davies, Tempest-Tost

Links

- Kolari Vision - https://kolarivision.com/
- Life Pixel – https://www.lifepixel.com/
- MaxMax - https://maxmax.com/
- CLiR - https://f64elite.com/ir-mastery/
- Cemetery Art - https://www.cemeteryart.net/
- Photography Life - https://www.photographylife.com/
- Good Reads - https://www.goodreads.com/