

Journal of NATURAL SCIENCE ILLUSTRATION

GUILD OF NATURAL SCIENCE ILLUSTRATORS



A Note From...

Gail Guth, GNSI Journal Co-Editor-In-Chief

Fall greetings from your Journal staff.

We are happy to present you with this most recent issue, which in various ways celebrates our annual conference. In addition to the synopsis of the conference, you will find two articles that grew out of conference presentations. We hope you delight as much as we do in both the artistic ability and clear explanation exhibited by both authors. Together they make a good illustration of the central strength of the Guild — sharing diverse skills in helpful, enthusiastic ways.

Scattered throughout are sketches from the conference and its environs that reflect the unique beauty and biological diversity of Asheville, NC and the surrounding mountains. Thanks to everyone who submitted sketches and photos at our request.

We are sad to share with you the passing of Diane Dorigan, one of our stellar members; we hope that you enjoy the written appreciation of a person, artist, teacher and so much more.

We remind you that we are interested in all kinds of articles. If you have an idea please let us know. If you would like help with the writing, we are happy to provide an editor.

This is the last Journal issue of 2017; look for a bulletin about the 2018 —50th anniversary— Conference in early January, and a Journal issue in late winter.

—Clara Richardson
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Cover: Golden Eagle, *Aquila chrysaetos*, by Rhonda Nass; Prismacolor pencils on tobacco Canson Mi-Teintes paper. © Rhonda Nass 1990.

GUILD OF
NATURAL
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GNSI JOURNAL

Volume 49, Number 3 /2017 • © 2017

GNSI JOURNAL OF SCIENTIFIC ILLUSTRATION (ISSN 01995464) is published roughly four times a year from 2201 Wisconsin Ave., NW, Suite 320, Washington, DC 20007, by the Guild of Natural Science Illustrators, Inc.

\$28 of your dues is dedicated to your GNSI JOURNAL subscription; no separate subscription is available.

This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

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GNSI JOURNAL SUBMISSION REQUIREMENTS

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Article Collection & Editing: Clara Richardson, Gail Guth, Britt Griswold

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Colored Pencil

— Rhonda Nass

As professional artists and illustrators, we've already discovered from experience that time is money, so if there are "tricks out there" which reduce time required to complete an illustration, those shortcuts are worth adding to our pool of skills. Whether you work in colored pencil or another medium, I hope to offer you several of those tricks as I describe the process I use to complete a colored pencil drawing. I will use the drawing of my mother's hands as the step-by-step process example (Fig. 1), with other illustrations complementing it as needed for added clarity.

Even though I'm typically doing scientific illustration—communicating accuracy of the subject's structure, colors, texture, and environment—I begin each drawing by determining what "message" I want to say to the viewer. Every other decision made re: the subject, format, design, placement, etc. is made with the intention of reinforcing that priority message. For example, if I want the viewer to recognize that everything in nature is interconnected, my illustration would not have only one subject with no additional element with which to interact; I would choose multiple elements. With multiple elements, I would not place one at the far left side of the picture frame with the other at the far right, because again as such, they would not interconnect. Instead I would position them touching in some way, possibly obviously with some overlapping, possibly subtly with merely the shadows touching. You get the idea. So as I begin, Step #1 is The Message.

Step #2 is determining The Emotional Tone and Palette to best deliver that message (e.g. awe, humor, urgency with subtle, in-your-face acidic, or monochromatic colors).

Step #3 is determining The Format—the dimensions and orientation to most effectively communicate the message. Regarding dimensions: business considerations influence the choices. Because I love the minute details of nature, in choosing to be an artist who replicates them, I have chosen a more time-consuming process to produce final artworks. We all know more time usually means a higher priced illustration or less income per hour. As people who make a living at this, we are continuously juggling how much time is required for excellence, how much time we have, how much money one can realistically



Figure 1: Mother's Hands

All artwork © Rhonda Nass

expect someone to pay, and how much creativity and fun will we have producing it. (Usually one of those considerations tumbles from the mix.) Because I normally have a deadline for the work, I try to make the process as efficient as I can without compromising the outcome. One of the tricks to meet the deadline is choosing to limit the size of works. The largest paper I use is generally around 12" x 17". As is, these typically take between 200 and 400 hours to draw.

Another decision to save time, which I'll cover later, is wisely choosing the paper color on which I draw.

So dimensions may be partially determined by business concerns. Regarding orientation: In my case—typically doing illustration with plants as subject matter—the format's orientation is often determined by the specific plant's growing characteristics—*i.e.* climbing vine = vertical, blossoms on a branch = horizontal.

Step #4 is determining The Viewpoint. Is the message reinforced by a distanced or close up viewpoint?

Step #5 is determining Relational Placement. With one element in the picture frame, the layout will be determined by how we position that element, whether it is included as a whole or cropped to include only a

Editor's Note: This article is derived from Rhonda's workshop at the Asheville Conference. While nothing can match learning technique in person from a master artist, we are grateful to her for sharing her methods with our wider GNSI family.

portion. We've learned that how we place elements in a layout establishes both positive and negative spaces. I was told that the Japanese word "ma" comes close to putting a value on negative space, describing that inactive whitespace as "full of nothing." It's similar to a rest in a musical score which offers silences amidst the notes, creating music instead of making noise. So negative space is as valuable as positive space.

With more than one element in the layout, our choices involve both proximity and arrangement. The shortcut rule of thirds is a nice place to start a layout: one divides the format horizontally in thirds and vertically in thirds and positions the chosen center of interest at any one of the intersections of that grid, (Fig. 2).

Many of us wish to go beyond merely that balanced flat perspective and add 3-dimensional atmospheric perspective with a foreground, deep mid-ground and background in our works, drawing the viewer into the image. See "Six Easy Methods to add Atmospheric Depth" (*below*).

For creating maximum depth perception, the best

lesson I've learned in over four decades of making a living as an artist was an invaluable tip from Robert Bateman, the stellar wildlife artist and conservationist, who generously revealed it in his technique demo for 80 of us (professional artists juried into his class). Before beginning a painting, Bateman removes from his working palette the lightest light and darkest dark colors of his medium. (So, in my case with colored pencil, I would reserve out a water-soluble white colored pencil which when wet is whiter than the dry white colored pencil, and I'd remove the indigo blue pencil which is darker than the black.) Bateman temporarily sets his darkest darks and lightest lights aside, then begins and completes, for all intents and purposes, his painting using a very light cream as his warm "white" and a very light powder blue as his cool "white," and whatever his second from darkest color is for his "black." The painting looks completed. But, with an additional 15 minutes or so, Robert Bateman reintroduces at the focal point of his artwork the "aces"—the reserved lightest light and darkest dark. WOW! The focal point suddenly jumps off the page

Figure 2: Cactus Bloom

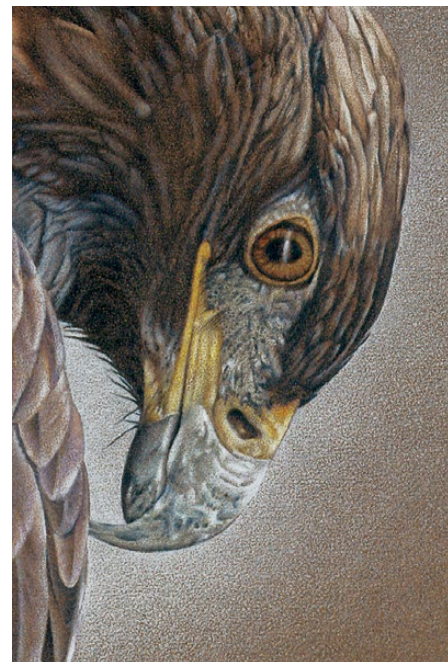


Six Easy Methods to add Atmospheric Depth

- 1. Size:** Enlarge a small element in reality (e.g. a flower) to be larger than a large element in reality (e.g. a mountain) and the enlarged flower is perceived as being in the front of the picture frame with the mountain in the back.
- 2. Overlapping:** If one element is partially blocked from sight by the covering of another element, the mind determines the overlapping element to be in front.
- 3. Detail/sharpness:** Usually the subjects within a composition recede visually as their outline edges are softened, blurred, diffused and as the textural details are reduced. Crisp outline edges and tightly rendered, detailed textures indicate foreground.
- 4. Converging lines:** We need only envision driving down a road with parallel white shoulder lines to grasp the concept of converging lines creating the sense of distance. The steeper the converging lines, the greater the perceived distance.
- 5. Color temperature:** Just as we see blue hills in the distance of landscapes, we can visually manipulate the viewer to perceive atmospheric depth by adding the cool greens, blues and purples to those elements we desire to recede and adding the warm reds, yellows and oranges to those elements we wish to visually pull forward to the frontal plane.
- 6. Polarized lighting and value:** If we had a continuum of light to dark with 0% black on one end, increasing percentages of dark in between and 100% black on the other end, background elements would be represented and drawn with the 20-80% values, appearing with subdued, flatter lighting. Elements drawn with the extreme, polarized 0% white and 100% black would be perceived as foreground items.



Figure 4: (left and right) Closeups of Golden Eagle (cover image)



with vibrancy. It makes the artist's chosen center of interest a magnet for the viewer's eyes, and pushes what may have begun as an ordinary artwork closer to the extraordinary. Thank you, Robert Bateman!

Step #6 is introducing Movement and Balance: By positioning the subject diagonally in the picture frame, and by cropping portions of the imagery out of the picture frame, movement is perceived both within and often beyond the layout's borders. I also try to envision each artwork as if it's a visual seesaw with linework, color, light and other choices available to create visual balance, whether working with a symmetrical or asymmetrical composition.

Once all the considerations of composition are determined, Step #7 is Creating Source Material — the visual reference to inform and guide the drawing. For me reference has been live, dried, frozen, but most often it is my own photography, primarily because it takes months for me to complete a work and live source material doesn't cooperate in staying in one position that long.

I have always been attracted to contrasts, especially contrasts of lighting. My favorite artist is the 16th century Italian artist, Caravaggio, whose subjects emerge from darkness into light. Thus, as I shoot photography for the source material of my subjects in each artwork, if it's possible I'll set up high contrast, dramatic lighting on the subject. I take several dozen photographs typically, and will digitally cut and paste them in Photoshop choosing to make a composite of those portions of the shots that capture best what I want to show the viewer. This composite final ends up being the reference for my drawing (Fig. 3).

With composition and source material in hand, I'm ready for Step #8, Choosing the Paper Color. Earlier I mentioned that limiting the size of the work and choosing the best paper color both save time. Toward that goal, I often choose a background color that is the predominate color of my subject, thus eliminating the need to draw or paint that color. You can see in the pencil work of the golden eagle (cover and Fig. 4, left) how the brown paper eliminates hours that would otherwise be needed to apply the brown color.

Here the paper does most of the work. To distinguish individual feathers I merely added cream and lavender to the brown paper to create the illusion of feather edges and added dark brown pencil to create the shadowed recesses. The majority of the eagle was done with three pencils. The main time allotment

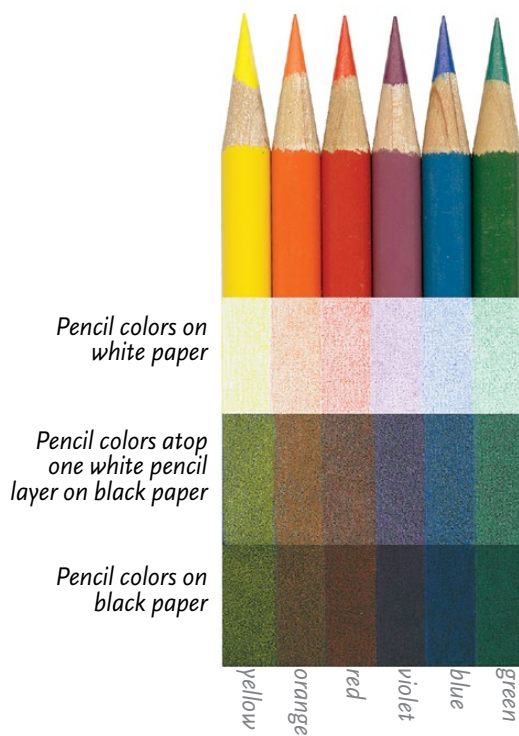
Figure 3 (Below): Hands composite image





Figure 5: Transferring linework

Figure 6: Colored pencil colors as applied to differing surfaces



went into laying several layers of white down as a foundation before pure golden ochre could be applied for the beak (Fig. 4). The white was used to negate or kill the paper color influence, basically replacing the brown paper with a white surface upon which I could apply a color and that color would appear pure.

Step #9 is Tracing/Transferring. Using transparent vellum tissue to place over the reference composite, I trace with graphite pencil the basic outline shapes of the subject. No detail at this stage. Then, using another sheet of thin tissue which I've covered on one side with a surface layer of white colored pencil, I'll gently place the "chalky pencil"-side down on the final art paper surface, then position in place above this transfer paper the tracing sheet with pencil outline. I use a red micron pen to retrace over the pencil outlines with light hand pressure initially. If at any

point I need to leave my drawing table amidst the transferring process, when I return, the red ink will tell me what has been transferred, and what has yet to be (Fig. 5).

Step #10 is Making a Color Match Strip. Paper choice has a huge influence in determining which pencil color to use to produce an accurate match between subject's color and original art's color. In the accompanying image (Fig. 6) six pigments are applied to white paper, then applied to a white pencil foundation atop black paper, then applied directly to the black paper. Huge difference, right? Creating a strip of various colors atop the specific paper color you've chosen for your work removes the guesswork and records what any chosen pigment will look like on that specific paper color; if you've chosen to do a drawing on black paper, your color match strips will be made using black paper and will be a future reference guide for any work you do using black paper.

For the color match strip, I lay down the same sequence for every color used and every layer is applied in a different direction from previous layer: (Note: my slight dyslexia surfaces every time I make a color strip, so you'll see that I've started at the right and moved left.) I begin by finding a pencil color that is close to one of the colors in my subject, say vermillion here (Fig 7). On the far right portion of the lower strip, I've applied a small rectangular shaped layer of vermillion directly on the black paper. Next to it is a second rectangle with two layers of vermillion directly on black paper. The third adjacent rectangle has a base layer of white with vermillion on top of it. The fourth rectangle has two layers of foundational white with vermillion atop them. And finally the fifth rectangle has three layers of white with vermillion atop. After completing the first segment comprised of those five rectangles, I write above the first and second rectangle in the vermillion color the number of layers used to create it and then write "vermillion" above the numbers. Similarly, above the last three rectangles comprised of white and color, I list in white the three appropriate numbers of layers, then draw a vermillion colored line through the white numbers. At any point in the future, this notation will inform me of both the specific colors applied and the sequence that was used to apply the colors (Fig. 7).

After completing several strips with the majority of subject colors represented, I can slide the strip alongside my photographic reference until I find

a rectangular color box that matches my subject's color and on that box will be the exact information needed for me to efficiently replicate that color on my artwork (Fig. 8). It's an amazing and incredibly effective tool to save time because you make it once, and use it "forever" for future works, without the time wasted to do the usual "guess and by gosh" system to match color. No matter the medium, you can make color match strips to save hours of time.

Step #11 is Applying Pencil Color: To ensure the color you apply today remains the color one sees for long term future, there is a method of applying the pencil to paper that is not the traditional application. Though papers come in various degrees of "tooth" (if highly magnified we would see peaks and valleys), I use paper with medium "tooth"—not plate smooth and not highly textured, but a surface called vellum. When the pencil is applied with moderate pressure to paper with highly textured/rough tooth, it only touches the paper's peaks and misses the valleys, with the resultant artwork looking very grainy—little visible pencil, lots of visible paper. When moderate pressure pencil is applied to vellum tooth and the pencil covers both top peaks and a bit into the valleys creating a greater pencil to paper ratio, the artwork looks less grainy. If one uses a precision sharp point on the pencil and holds the pencil more upright than diagonal, the pencil covers peaks and can ride deep into the valleys—pencil to paper ratio is high and artwork appears only minutely textured.

Most colored pencils are comprised of a pigment bound in cellulose gum and wax or oil. When the pigment is applied to paper the wax is applied. If the hand pressure used to apply the color is light, the color intensity transferred is light; if hand pressure is heavy, a more intense color appears. The disadvantage of the heavy-handed approach—pressing the color into the paper—is it creates a condition in which the accompanying wax is forced into the paper's valleys and months later rises to the surface to create what is called "wax bloom," similar to the matte, dull bloom on grapes. To avoid that muddled wax build-up, I've devised a technique to achieve intensity with multiple layers of pencil (not pressure), each applied in a fresh direction: the first layer applied vertically, second horizontally, third diagonally, fourth vertically, etc. This assures both the artist and the potential buyer of your art that the color laid is color stayed. So... the first tip is light hand pressure, the second is applying each layer in a fresh direction from the previous layer

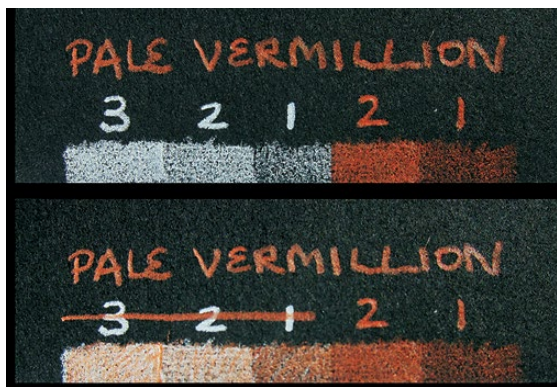


Figure 7: Color match strip

(Layering each different direction). Then comes the actual stroke used.

Though there are numerous methods to apply colored pencil, the stroke I primarily use is a modified hatch. Traditionally one starts with the pencil on paper, making an even mark, lifting the pencil and again placing it on the paper next to the first stroke and making the same mark, then continuing until there is a body of marks creating a tone, then the next row is begun making the same rigid marks. The trouble with this application is the appearance of a visible seam between rows that the artist has to come back to tweak. Not very efficient.

I've altered the rectangular-shaped hatch stroke with what I call the airplane stroke because my pencil tip

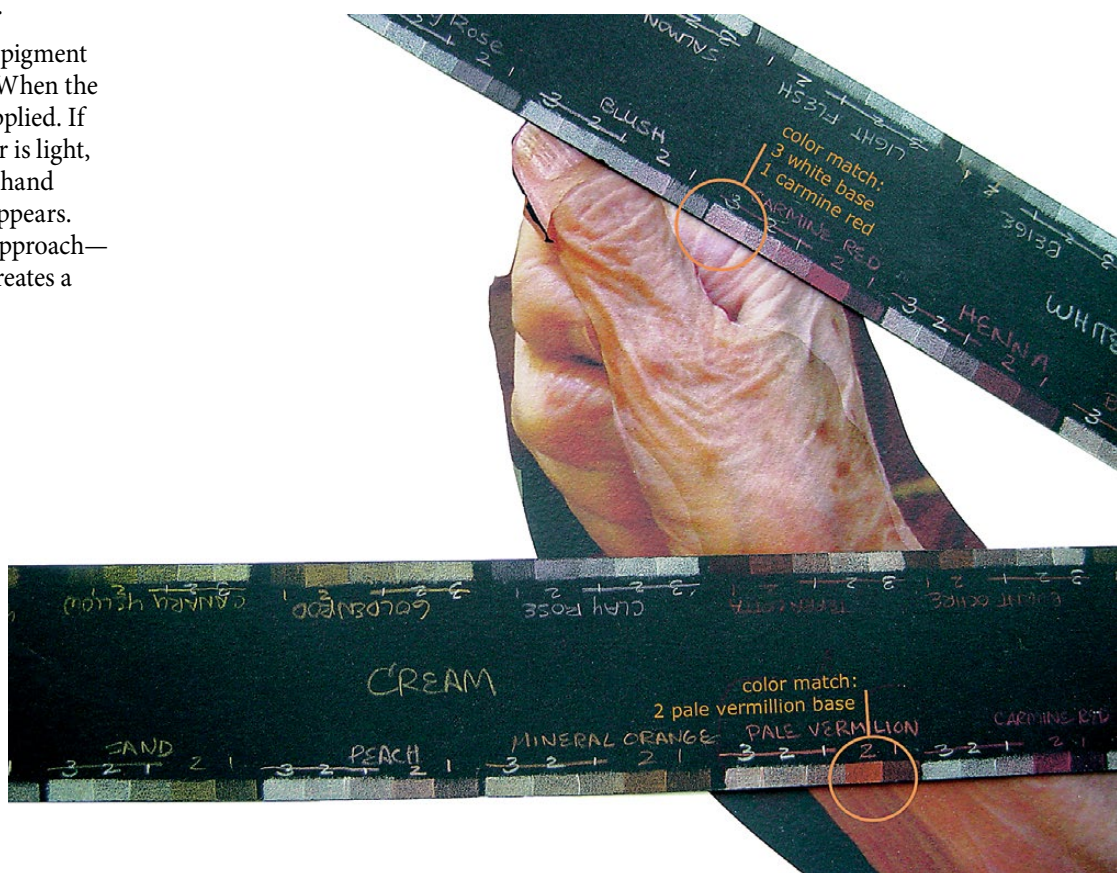
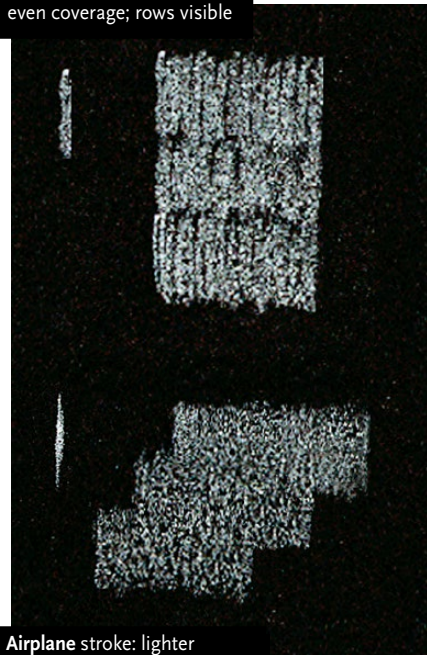


Figure 8: Color strip alongside hand composite

Traditional stroke: abrupt start and end of stroke, even coverage; rows visible



Airplane stroke: lighter approach and take-off; denser coverage in middle creates invisible rows.

Figure 9 (Above): Traditional pencil stroke versus canoe-shaped 'airplane' stroke.

Figure 10 (Top right): White foundation drawing

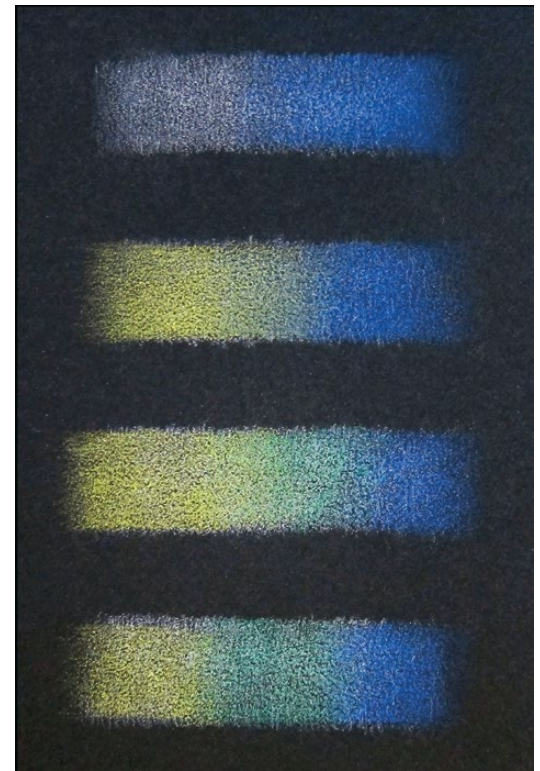
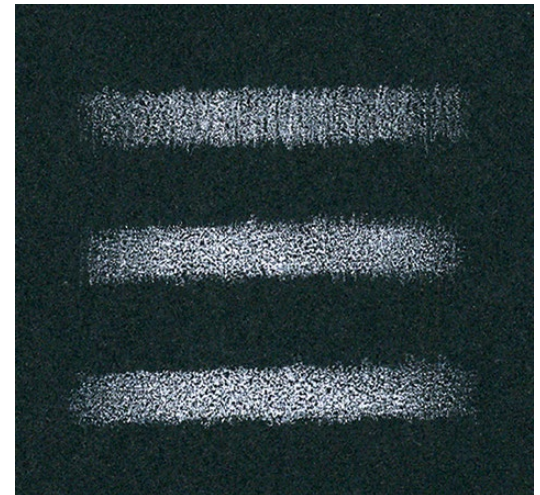
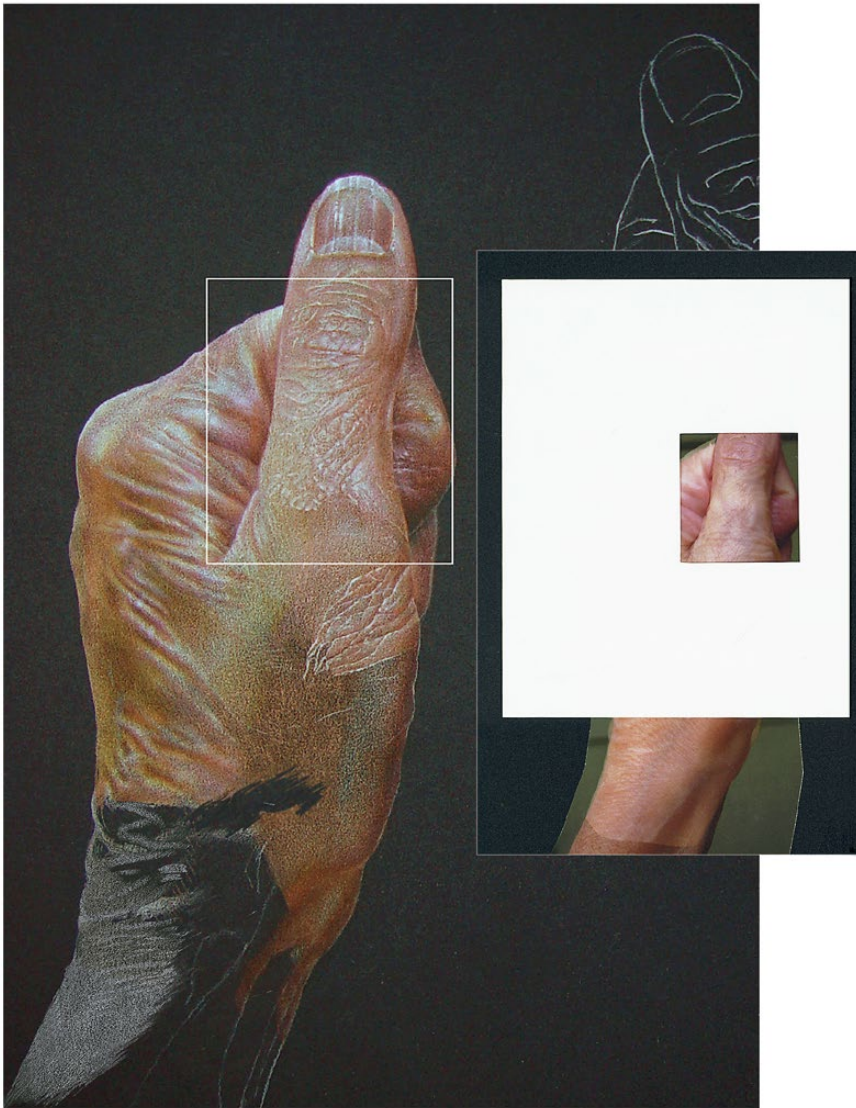


approaches the paper as a plane would approach a landing strip, gently glances the surface initially, then makes solid contact, then gently lifts off at the end the stroke. This touch and go approach creates a canoe-shaped mark rather than a rectangular one (Fig. 9). When the first row is done with airplane strokes and the approach strokes of the second row begin halfway up into the previous row, the weaker beginnings of the 2nd row's strokes overlap the weaker ends of the last row and they merge, creating an equivalent coverage to the denser parts of the canoe-shape strokes previously laid, so the coverage is seamless with no need to tweak. The airplane stroke saves massive amounts of time in the long run.

I start applying pencil using the white foundation. Using the paper color for the subject's major color, I determine where I need to diminish or lose that paper color and begin each drawing with its white foundation. On the good art paper with the transferred outlines I start near the upper left and do small areas at a time to completion instead of doing an assembly line

of areas throughout the composition which have the same coverage needs (Fig. 10). That's a personal choice; you might choose a different approach.

If the subject or composition is complex, in order to not lose my place or become too overwhelmed or discouraged, I isolate a very small portion of the picture frame to draw at one time by use of what I call a sanity window (Fig. 11). It's a white paper with a cut window placed on my reference, allowing me to see only the area that is exposed within the window; that is the only section I work on. The workload and mental stress are both immediately reduced when I envision less complex and smaller, doable work sessions.



There are many instances when one pencil color needs to gradually disappear into the paper color. This technique of lightening the hand pressure to make the pencil coverage gradually disappear is called vignetting. Shown here is a white pencil vignetted with 1, 2, and 3 layers (Fig. 12). Again, each layer is applied in a different direction to avoid the wax build up.

After the white foundational layer, vignetting occurs hundreds of thousands of times as one creates new colors by layering one pencil's pigment with another's. Here's an example of one color layer vignetting over a white foundation and a second example of two pigments—yellow and blue—creating a third color—green—by the two vignetting into each other, all over white (Fig. 13).

The drawing is thus completed in these stages: applying white foundation, then color atop where needed, then color merging with vignetting where needed, and vignetting where blurred diffused edges are needed to create the illusion of elements in the background. Then the indigo 'ace' is applied for darkest darks.

Finally the water-soluble white 'ace' is applied by placing a bit of water in my left palm, turning a sharpened water soluble pencil in the water to release some of the pencil's pigment into the water, then with a #1 brush picking up some of the coagulated white pigment in the water and stippling it on the areas

Figure 11 (Top left): Cut out window, isolating content

Figure 12 (Top right): Vignetting example

Figure 13 (Above): Merging color with vignetting



Figure 14: Applying white “aces”. “Aces” is Robert Bateman’s term for the lightest and darkest parts of a painting, and is referenced in detail on page 4.

needing the highlights (Fig 14) And voilà...you have a colored pencil final artwork with impact.

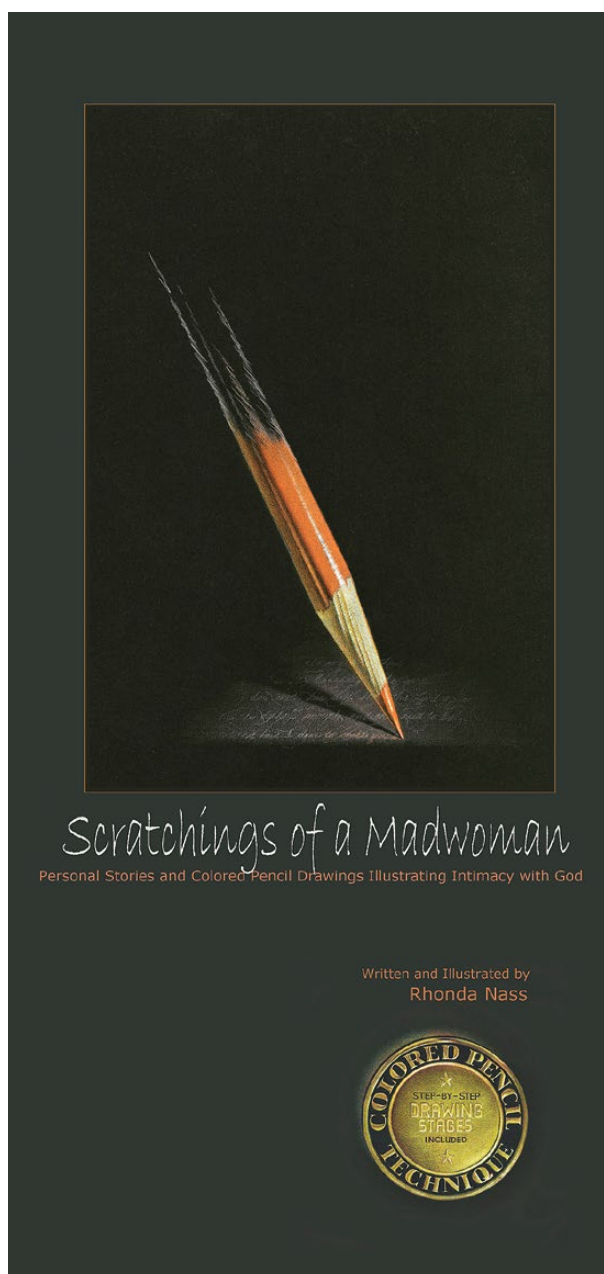
My husband, Rick, insists there is one additional step in the process to create colored pencil drawings with my technique: “Rhonda loses money on every job, but makes up for it in volume.” Oh, but how we love what we do, right?

Colored pencil is an amazing medium which, with patience, can communicate all the details you observe and wish to replicate. It has the added bonus of being a great complement to other media (watercolor, acrylic, graphite, ink, etc.). Please don’t hesitate to give it a try. You will find yourself luxuriating in the process!



“If you are interested in pursuing colored pencil work, and would like to try this technique with some guidance, my book, *Scratchings of a Madwoman*, offers step by step instruction through the process to create a colored pencil drawing, using one of my drawings as a model with hopes that you will follow along using your own subject choice. You may view the book’s full content [and if interested, may order via Pay Pal] on my husband’s and my website, www.rnass.com. Or feel free to contact me directly at rnass@charter.net. *Scratchings...* is 7” x 14.5”, 65 pages, \$45 a copy and is densely illustrated.”

—Rhonda Nass





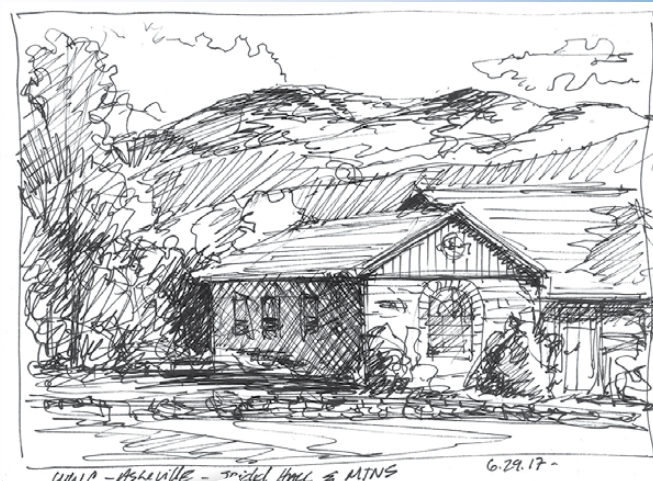
Above: Drawing of the red-eyed vireo fledgling outside of Kittredge/registration; ©2017 Robin Carlson

Below: Warren Wilson College; I found this chair over by the bell tower; ©2017 Nancy Hart



Right: Pen sketch of Spider Hall looking towards the mountains; ©2017 Bruce Kerr

Below: Farm sketching; ©2017 Karen Johnson



Sketches from Asheville



Right: Star, NC with goats; ©2017 Liz Lockett

Augmented Reality: *The New Kid On The Block*

— Diana Marques



Figure 1: Visitor in the Bone Hall viewing the AR content for the Mandrill. When using the tablet, a visitor sees a 3D model of a fully fleshed animal superimposed on the skeleton. Photo by Nico Porcaro.

What does Augmented Reality (AR) bring us that other technologies have not thus far? Its name says it all: the capacity to enhance the environment around us, without detachment from reality. AR is most commonly featured on mobile devices: while the device's camera captures the surrounding objects and spaces, the device's screen shows the virtual content superimposed onto the object, aligned in real time. Magazine covers and birthday cards can be animated, street signs in a foreign country translated, and human anatomy can be visualized in three dimensions for instructional and educational purposes.

From a technology development point of view, it is not brand new, given it was theoretically conceived and prototyped in the 1960s. But the evolution of hardware in the last two decades paved the way to more mature AR applications and in the last few years the interest and investment in this technology grew noticeably in a number of fields. The gaming and entertaining industries, the usual suspects, have embraced it (think Pokémon Go, the free-to-play global phenomenon game from summer of last year),

but its value for the education and cultural sectors, editorial, biomedical visualization and others has been recognized and put to the test. This technology even promises to revolutionize the way we shop, by placing virtual representations of the furniture we are considering over the empty living room, and virtual pieces of clothing onto our image in the mirror.

As part of my doctoral dissertation in Digital Media, I was involved in developing illustrations and animations, as well as designing the user experience and interface of a mobile AR application called Skin & Bones. Companion to a permanent osteology exhibit at the Smithsonian's National Museum of Natural History, the app uses the technology to virtually skin and bring to life specimens that otherwise many visitors do not engage with (Figs. 1-2). For any science illustrator, the Bone Hall is a true haven — give me art supplies, bread and water and I can lose myself in there for days! But the non-expert museum visitor often finds the extensive number of skeletons lacking context and thus repetitive. Associating virtual representations of the animals with their real bones, even allowing visitors

Editor's Note: This article is derived from Diana's workshop at the Asheville Conference. While nothing can match learning in person from a master artist, we are grateful to her for sharing her methods with our wider GNSI family.

to see the animals move and feed, not only delights the visitors but also supports the connection with the objects on display. All of this happens without physically altering an historical collection, which would incur a high cost, not to mention disagreement with the exhibit curators¹.

Skin & Bones is an example of a native app (meaning it was custom designed and developed from the ground up), a method for delivering augmented content that depends on the expertise of software developers. However, an easier and less costly method is to use one of several already-developed AR browsers, some of which can even be used for free. These platforms don't require any particular skill beyond preparing and then dragging-and-dropping the content to be augmented. Even though most AR browsers are somewhat finicky to use — all the assets have to be prepared exactly according to the instructions, which tend to be detailed and vary greatly from browser to browser — if all goes well, in a matter of minutes the AR content is ready to be viewed.

In this fashion, we can create a virtual image gallery that is augmented over our printed business card, we can play a video of the animal behavior or hear the sound of its call over an original illustration on display at an exhibition; we can even look at a virtual tridimensional representation of a complex anatomical structure that is difficult to convey on paper. All the user needs is a mobile device (phone or tablet) equipped with the app that corresponds to the AR browser employed to create the experience. Whereas downloading a native app gives the user an experience that is exclusive to a certain context, albeit usually more advanced and sophisticated, downloading the app of an AR browser unlocks all augmented experiences that have been built on that platform².

Most AR experiences are either image-based or location-based. With image-based content, the image, video, 3D model, text, audio, or link to URL is superimposed onto a printed image. With location-based AR, it is our position, dictated by the GPS coordinates that the mobile device reads, that triggers the content. The latter is used mostly in outdoor experiences, for example in assisting with navigating to a particular destination.

¹ Skin & Bones can be downloaded to iPhones and iPads from the App Store or using this link: itunes.apple.com/us/app/skin-bones/id929733243. To see the AR experiences without visiting the Bone Hall, print the photos of the skeletons made available in the app, or display them on your computer screen, and point the device to them when visiting the Skeleton Works menu choice in the app.

² A few examples of AR browsers to explore: Wikitude, Aurasma, BlippAR, Layar.

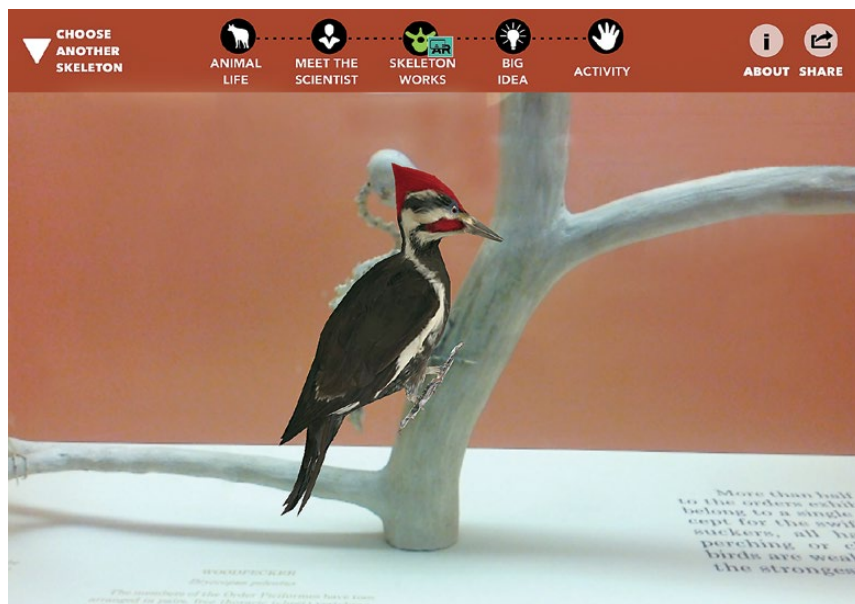


Figure 2: Skin & Bones iPad screen capture of the AR experience for the Pileated Woodpecker, showing a frame of the animation triggered from the skeleton. In the animation, the skeleton becomes fully fleshed and feathered; then the skull is isolated to illustrate the tongue mechanism that is specialized for catching insects.

Object-based AR, such as what is used in Skin & Bones, is a less common form of the technology for its complexity, yet very effective since the virtual content can be triggered in 360° degrees around the object. Were the skeletons in the Bone Hall free-standing rather than inside display cases, users could loop around the Mandrill and see it up close from every angle – how amazing that would be!

As visual science communicators, the day may come when you are asked to produce static and animated visuals to take part in an AR experience. You may be in a position to recommend the technology for its value in merging the observational and interpretational aspects of an experience. Having a basic understanding of what it is about, how it operates and the tools available is to your advantage. Consider as well its potential in promoting a freelance business: direct a client to a website when s/he clicks on the virtual link hovering over a business card or flip through a virtual gallery of illustrations.

AR may never live to the high expectations that technologists and investors currently have, but it seems to have proven that is more than an ephemeral fad. Time will tell.

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Distinguished Service Award:

Amelia Janes

— Linda Feltner and the Nominating Committee

In consideration for her service on the GNSI Board, her conference involvement, her GNSI Chapter work, and countless behind the scenes efforts and connections (and the occasional maps rendered for the Guild) it was with great pleasure that GNSI's Board of Directors awarded the Distinguished Service Award to Amelia Janes. The Distinguished Service Award is given in recognition of long-term dedication and work within and on behalf of this organization.

Amelia earned her Bachelor of Fine Arts in 2D design at Murray State University in Western Kentucky, where she produced abstract art influenced by nature. She followed artists like Dorothea Rockburne and discovered a fascination with minimalism. She then pursued an MFA in 2D Design at University of Wisconsin at Madison. As a graduate student, on a surveying trip with a group of archaeologists, she made an important connection that led her on the path to science illustration. As the group measured and plotted Native American effigy mounds in central Wisconsin, she realized a potential relationship between art and science. From that 'Aha!' moment forward, she sought to connect her skills in realistic rendering with the sciences.

After school, she pursued cartography as a profession. She learned all of the traditional map making techniques, including cutting emulsion with sapphire-tipped scribes, cutting rubylith, burnishing type on acetate, and compiling layers of components for the darkroom. With the advent of computers, she learned the computer-assisted techniques to replace scribing, rubylith, type stick-up, halftones, and darkroom process for making plates.

Since 1996, she has been contracting and freelancing illustrations for geography and history teaching aids and textbooks. She co-authored and co-illustrated an award-winning atlas of history for Wisconsin, she wrote *Illustrating Earth Sciences*, as well as a chapter for the second edition of the GNSI Handbook.



Amelia joined the GNSI in 1991. Her desire to develop her carbon dust technique helped lead her to the Guild. In workshops with Elaine Hodges, she learned how to trim and singe sable brushes to make custom shapes, developing a "dry" tonal painting which merged her art school training, skills in interpretation, and rendering ability.

She has served as Membership and Recording Secretary for GNSI. Past President Clara Richardson learned from her what it is to have a right hand person, a steadying force for achievement. She also helped establish the Great Lakes Chapter.

Amelia finished her four year presidential commitment to the GNSI Board at the end of this year's conference [*Ed. Note: GNSI Presidents serve as President Elect for one year, as President for two years, and as Past President for one year*]. As President, she served thoughtfully and without fanfare, helping the organization to refine its vision and strategic work, quietly working behind the scenes to strengthen our working relationships within the organization.

Her most recent contributions include conceiving of this year's conference, vetting this venue, promoting the region, and working with her amazing husband, Paul, to serve as the local expert and networker, a job they are particularly suited for since they live in the western mountains of North Carolina.

When she is not conducting Guild business, she continues to produce maps, block diagrams, and shaded relief illustrations for history, geography and earth sciences publications, and one can only imagine that she weaves her thoughtful, playful, creative spirit

Amelia Janes. Photo © Julie Fetchco

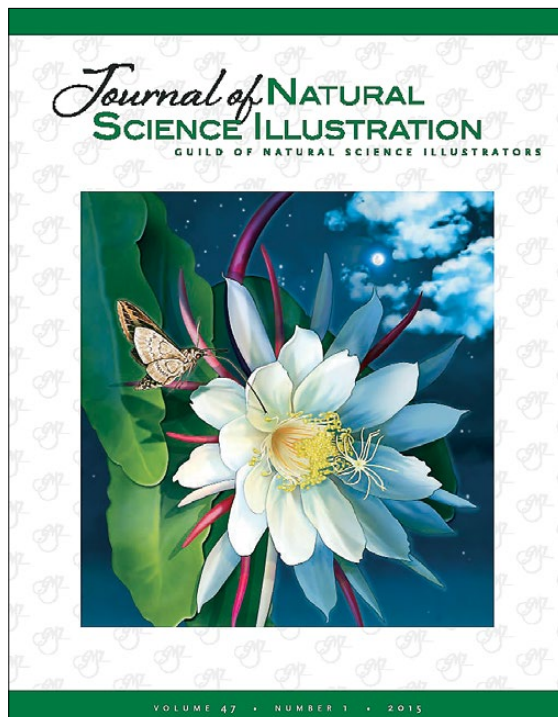
and talents through everything that she does.

When asked why has she volunteered so much personal energy to GNSI over the past 4 years she replied:

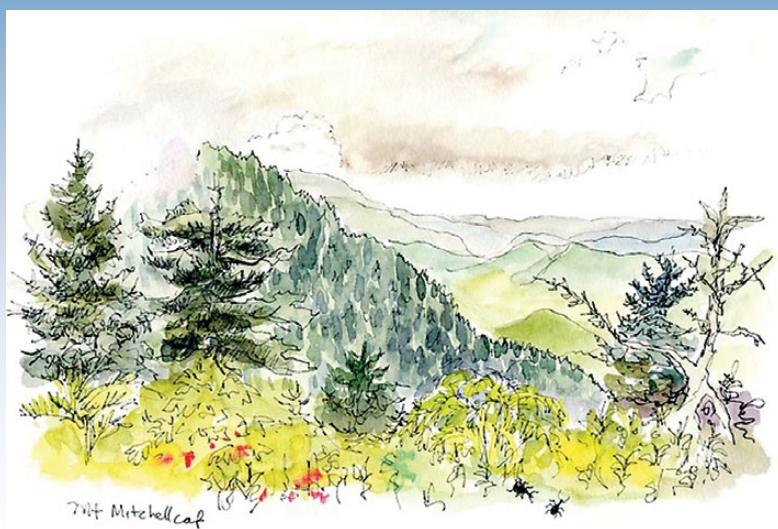
The benefit of this collaborative work has been a way to expand my personal experiences, and to share my curiosity about different ways we can work together. Just as I had to be flexible enough to move from carbon dust shading on vellum to Photoshop airbrush on a monitor, so have I assisted and supported my colleagues in finding new ways to manage our endeavors.

And she has. This past year as I have served as Acting President, I have seen where she has generously and freely provided support and guidance to me, as well as to the newest members on the Board. And I personally thank her.

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EDITORS' NOTE: Amelia Janes was the subject of JNSI's Member Spotlight in 2015, vol. 47(1). Her illustration of a Night-Blooming Cereus graces the cover.



View from Mt Mitchell ©2017 Frances Topping



This pine snake was from the animals in the classroom lecture. He stayed quite contently on the table for me and was a lovely model. I greatly enjoyed working with him. It was a real privilege. ©2017 Sarah Dahlinger

More Sketches from Asheville



This 'thing' was sketched in the dark auditorium during the Monday morning Keynote speeches from Robert Johnson and Ron Miller. I suspect I was thinking about if Lemurs had developed bow and arrows. (It could happen). ©2017 Amanda Zimmerman.

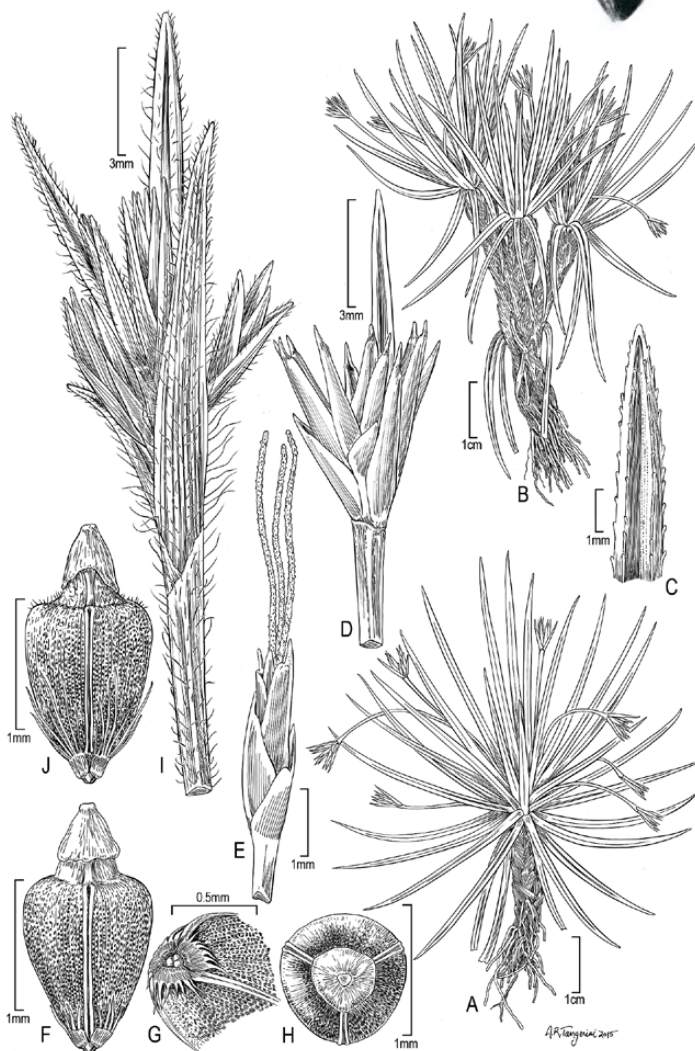
2017 Members' Exhibit: The People's Choice

GNSI members at the 2017 annual exhibit opening were asked to vote for their favorites in each of two categories, color and black-and-white; here are their top choices. The exhibit was held at the Elizabeth Holden Art Gallery, Warren Wilson College, Asheville, NC.

The full exhibit can be viewed online at:
<https://gnsi.org/gallery/2017-members-exhibit>



The Anatomy of the Beak of the Flamingo ©2102 Xavier Pita
Digital



Cephalaria glabra and *C. rigida*, Alice Tangerini 2015
Pen, brush and ink on drafting film



Spectacled Owl ©2106 Rebecca Gelernter
Watercolor



Spring's Welcome to All / Apple Blossom Rhonda Nass ©2016 Rhonda Nass
Acrylic on canvas



Sangusaurus and Nundasuchus ©2016 Marlene Hill Donnelly
Carbon dust / digital

In Memoriam: Diane Dorigan

— Alexandra Pataky



Diane with two of her works in group exhibit put on by the GNSI Great Lakes Chapter in April of 2016, at the Brushwood Center at Ryerson Woods in Riverwoods, IL.
Photo © Karen Johnson

The first time I met Diane, she was interviewing me for a job. I remember thinking that Diane was really nice. I ended up getting that job, and over the years working with and being mentored by Diane, I found out I was wrong — Diane was not nice.

Diane was passionate, talented and thoughtful. She cared deeply for students. Caring about politics, art, animals, justice and education, she was well-read and curious, proudly a life-long learner. She cared about her friends and family and lived her words with action, whether it meant standing up for someone, raising her own awareness, advocating for those being marginalized, or volunteering time and expertise to make a difference in her community. Diane was quiet about herself, and a cheerleader for others.

Diane's work is reflective of her personality — subtle, skilled, complex, intelligent and beautiful. Her work was constantly evolving and improving — she pushed herself, always engaged in making work, looking at work, staying involved in her studio work professionally. A photographer, painter, scientific illustrator and printmaker, she explored media and techniques, attended workshops, got involved in studios and of course, the Guild (GNSI).

Diane was a learner. She would periodically take a class to learn a new printmaking technique or new medium to add to her already impressive arsenal of skills. Sometimes she would take a class in a subject she already excelled at — watercolor, perhaps — because she was interested in learning from a new person, and seeing the subject from another

perspective. She modeled for students and colleagues what it meant to pursue a passion with dedication and intent. She showed us that art was important and rewarding and could be woven into a purposeful and potent daily life.

The best kind of teacher, she was steeped in her subject matter, thoughtful, compassionate, profoundly generous, and passionate about learning. If you knew Diane, chances are you attended a class or lecture together at some point, and she probably gave you an article to read, post-it notes included. Diane loved to learn and she loved to share knowledge with others, through teaching, but also through her involvement in studios and professional organizations. She taught us that activism as well as self-expression through art and education could be powerful and empowering.

Often, teachers or artists with big personalities receive a lot of accolades and time in the spotlight, but Diane didn't really seem to want accolades or the spotlight. She wanted to share art with people. Diane connected with kids in a meaningful way through art and learning that had a profound impact on generations of high school students that came through her classroom door. Kids that returned year after year to visit her and thank her for opening up a world to them that became their life and often, their livelihood. Colleagues, like myself, who were guided and mentored by Diane so generously, benefiting from her willingness to share her time and knowledge. Her willingness to share a passion with others and watch a spark ignite for someone else.

Diane's legacy is one that will live on through the thousands of students and colleagues and friends that she touched along the way, who will pass on her love of art and learning through our own interactions. Her legacy will continue through the body of work she created in scientific illustration, printmaking, photography, book and paper, painting, drawing and more. Nice? Yes, Diane was lovely.

I hope you find a moment — quiet or lively, outside in nature or in the studio, or whatever rings true for your friendship with her — where you can remember and smile and raise a glass of wine in a toast to Diane.

2017 GNSI Conference Review

Our Week In Beautiful Asheville, NC

— Linda Feltner

Coming from hot and dry Arizona, the heady aroma of GREEN was like a tonic — evocative of the verdant woodlands of my childhood. Our host campus, Warren Wilson College, provided a charmed atmosphere where forest and buildings intertwined. Distances from

auditorium, cafeteria and classrooms were minimal, where birdsong and lush garden plantings along the pathways invited us to linger. Many a member was seen crouching to examine an insect or blossom, or peering upward into the canopy.

The Blue Ridge Mountains' elevation provided pleasant temperatures and cool evenings for most of the week. Members jogged, walked or strolled the campus trails, and shared photographs of their

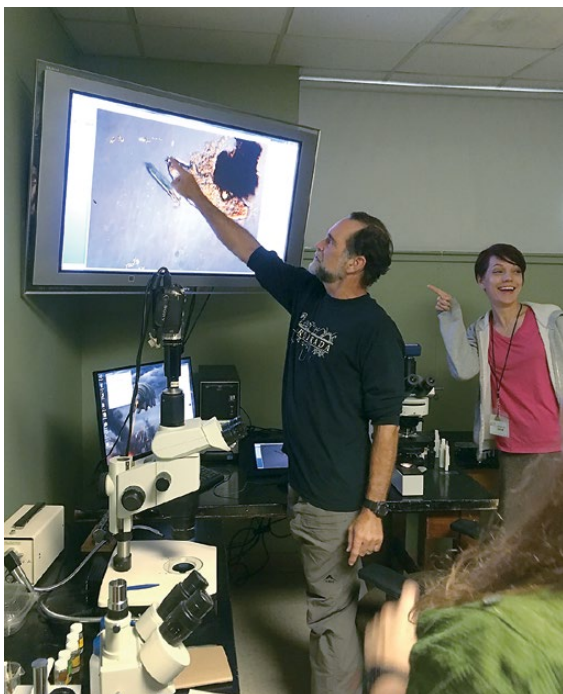
discoveries along trails and streams flowing alongside the campus. They didn't have to walk far to have the peace of the forest surrounding them and opportunities for sketching ranged from salamanders to bears. This set the stage for our official welcome to Warren Wilson College, near Asheville, North Carolina.

On Sunday, the GNSI Board of Directors gathered for their traditional meeting for the entire day, benefiting from the opportunity to be together to discuss Guild business. Attendees arriving on Sunday were invited to participate in a special event, the Collaborative Mural Painting Party, organized by Jennifer Landin, our excellent Conference Chair,

Top: Sunday evening portfolio sharing. Photo ©2017 Britt Griswold

Bottom right: Triple Falls watercolor sketch. ©2017 Frances Topping

Bottom left: Professor Paul Bartels gave a 2 hour lab tour and demo in the Photomicroscopy lab. Photo ©2017 Taina Litwak.





Top Left: Plenary talk by Ron Miller: *Illustrating the Universe: Stars, Moons and Galaxies*. Ron Miller is author of *The Art of Space: The History of Space Art, from the Earliest Visions to the Graphics of the Modern Era* and *The Grand Tour: A Traveler's Guide to the Solar System* 3rd Edition completely revised. Photo ©2017 Britt Griswold

Top right: Techniques Showcase: Nancy Hart teaching mixed media: pen, ink and watercolor. Photo ©2017 Britt Griswold

Bottom Right: Techniques Showcase: Karen Ackoff teaching egg tempera. Photo ©2017 Britt Griswold

who is an Assistant Professor of Biological Sciences at North Carolina State University. [The mandalas and Jennifer's description of this project occupy pp 26-27 of this issue.]

Sunday evening's Portfolio Sharing (photo on pg. 19) is often considered the unofficial kick-off of GNSI conferences and has become one of my favorite events. The bright and spacious Canon Lounge contained long tables to display the impressive array of members' portfolios and sketchbooks. This opportunity to share one's work, peer through pages or scroll through screens provided insight into the diversity and innovation of our members. At its peak, the room was filled with discussions about work, projects and publications. This event gave us introductions to new colleagues and renowned illustrators that inspire us. Our members are among the best to share their expertise, inspiration, challenges and innovations with others.

The core conference encompassed Monday through Wednesday. Each day began with an array of plenary speakers addressing our assembly of 167 attendees, 33 guests, representing five countries. Dr. Amy Boyd, Professor of Biology, welcomed us to both Warren Wilson College and the biodiversity of the Blue Ridge Mountains. Our curiosity for the region was kindled by her article in the GNSI Journal (Vol. 49(1), 2017).

Ron Miller (top left), the renowned astronomical artist, entranced us with the rich visual paintings that shaped our earth-bound vision of space (and his secret use of smoke bombs!). Robert Johnson shared his development of his signature art style. Nancy Lowe showed us how collaboration is applied

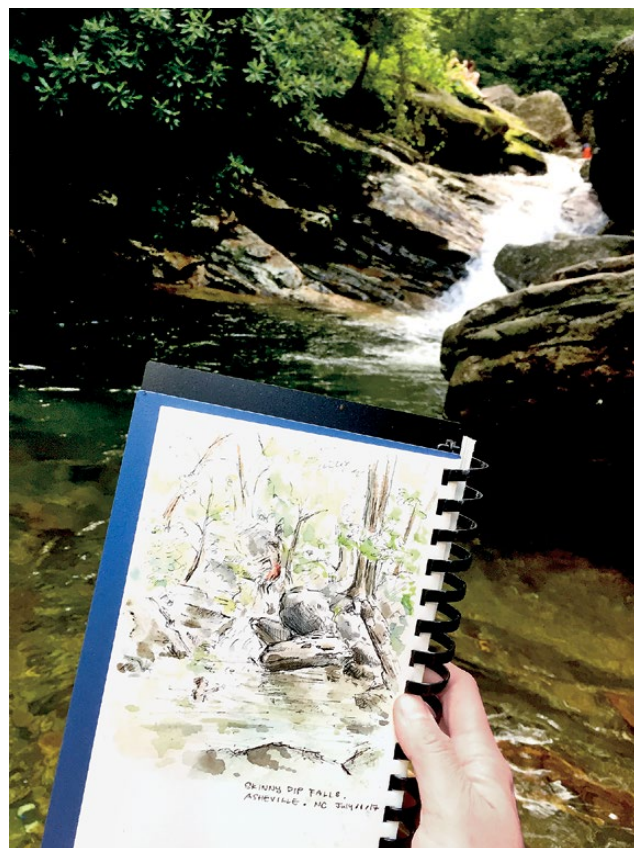
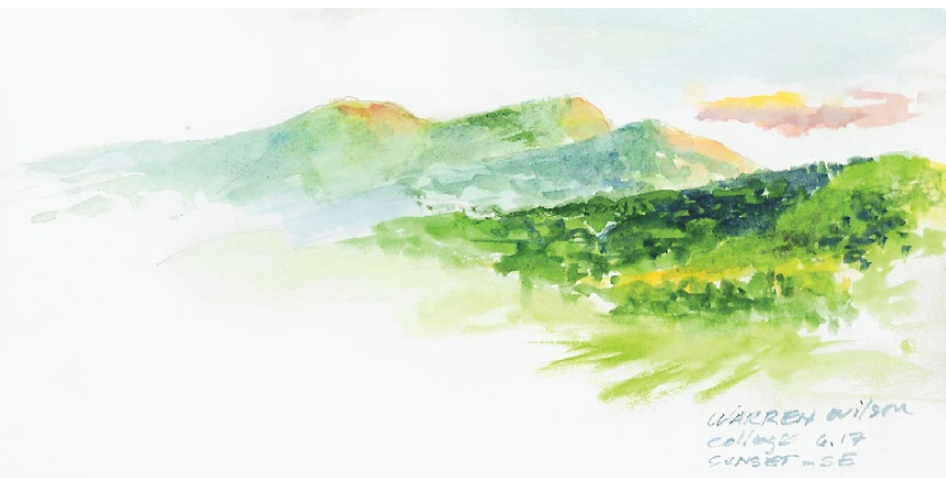


with artists and scientists to develop curiosity and creativity through the AS IF Center. John Pickering of DiscoverLife.org and Save All Species Initiative outlined an extensive study with moths to understand factors that affect these communities.

Paula J. Ehrlich inspired us with a narrated short video from the E.O. Wilson's Biodiversity Foundation and described the Half-Earth Project as a call-to-action for protecting half the Earth, one of the grandest conservation efforts of our time. Todd Witcher's Discover Life in America All Taxa Biodiversity Inventory fascinated us with the scope of research discoveries.

Core conference afternoons were filled with lectures, presentations, panels and the ever-popular Techniques Showcase (above). Impressive collections of topics left us wishing that Britt Griswold (the *Great Big Deal*) would construct a cloning machine. Numerous distinguished speakers and valuable topics left us wanting to attend multiple lectures at the same time. Our Programming Co-Chairs, Elizabeth Morales and Peter Green, along with Robin Carlson, spearheaded an exceptional lineup of presenters.

I considered listing the array of presentations as well as individual praise for their contribution to our education, but the list is long and praises widespread. The depth of this year's presentations, lectures and panels surpassed many expectations. Choices were tough between digital and traditional techniques,



including ZBrush, 3-D Modeling, Acrylic and Colored Pencil, and Scratchboard. Science topics provided inspiration through water bears, solar eclipses, botany, veterinary medicine and paleo reconstructions. To this, add business marketing, teaching scientific illustration and social media. The scope of presentations was valuable to our members who requested funding from their institutions, and those who qualified for academic credits for attendance.

The GNSI 2017 Annual Exhibit Reception was held at the Holden Arts Center on Monday evening. The exhibition showcased 67 framed illustrations juried from 164 entries by 99 members. The exhibit can be viewed on the GNSI web page. This reception was jam-packed with lively conversation and provided a chance to observe in detail the diversity of work created by our members. During this event, members voted on their favorites in both color and black and white categories. The People's Choice Awards occupy pages 16-17 of this issue.

The Techniques Showcase has become a classic event and provided the opportunity to ask questions of those who generously shared their techniques, experience and advice. Demonstrations ranged from exquisite traditional to elegant digital techniques, presented by Trudy Nicholson, Rhonda Nass, Carol Creech, Cheryl McCutchan, Quinn Burrell, Karen Ackoff, Nancy Hart, Matt Patterson, Charlotte Ricker, Nicole Wong and Kapi Monoyios.

Tuesday evening's GNSI Auction proved to be another memorable evening. Two auction segments provided ample opportunity to scoop up some cool items and savor humorous entertainment. The silent auction included collectibles from the estate of our beloved John Cody, out-of-print books illustrated by Trudy Nicholson, and cropped selections of the spectacular Santa Cruz Chalk Mural! Our hosts for the highly enjoyable live auction were Smokey Bear (Dave Clarke), John Norton in his signature

tropical shirt, and the ever-anticipated entrance of the Appalachian Crow (Sara Taliaferro). Highlights of the live auction include an exquisitely sculptured cicada brooch by Karen Johnson, a cephalopod/Cthulhu cap complete with tentacles (pg. 23), Ikumi Kayama's knitted salamander mittens, an original scratchboard by Trudy Nicholson, a watercolor preparatory study by myself, and Amy Gagnon's swallows and coconuts. We were once again privileged to close the evening with John Norton singing *The Element Song*.

The Annual Banquet concluded the core conference. The Banquet was a special occasion to show appreciation to the volunteers and to present GNSI's most cherished awards. Our volunteers often work in the background and are unknown to most. These special people donated small, medium or large

Top Left: Blue Hills Sunset
©2017 B Kerr

Top Right: Skinny Dip Falls
©2017 Daisy Chung

Bottom: Cory Van Auken
leading a museum tour. Photo
©2017 Britt Griswold





Top: Triple Falls
©2017 Frances Topping

Bottom: Banquet. Photo ©2017
Britt Griswold

amounts of time that when put together, make GNSI conferences so successful and fulfilling. This year's conference utilized the skills of over 40 volunteers. The Guild thrives on a foundation of volunteers, and during the banquet, the gifts and applause are heartfelt appreciation of their contribution.

A new award was created especially for Britt Griswold. The Great Big Deal Award was established with sincere as well as heartfelt humor. Amelia Janes told the story of how high status and honor led to the birth of the moniker a "Great Big Deal". We recognize that the success of many past conferences rests on Britt's shoulders as well as his current service to GNSI as webmaster, committee advisor; and whose service continues to be extensive and profound. We sought to present him with a special award that is uniquely Britt. The hat embroidered with GBD will be a reminder that we consider him a Great Big Deal.

The GNSI Distinguished Service Award was given in

recognition of long-term dedication and work within and on behalf of this organization. In consideration for her service on the GNSI Board, her conference involvement, her GNSI Chapter work and countless behind the scenes efforts and connections, it was with great pleasure awarded to Amelia Janes. An excerpt from the award announcement: "As President, she served thoughtfully and without fanfare, helping the organization to refine its vision and strategic work, quietly working behind the scenes to strengthen our working relationships within the organization." An article about Amelia receiving this award is found on pp 14-15 of this issue.

The evening's events continued in the Pavilion, where we enjoyed the organic music of a Drum Circle, facilitated by Larry MacDowell. West African type of drumming with traditional djembe and dunun drums and other amazing instruments provided intertwining rhythm and an overall creative experience where everyone was invited to participate. Many members joined the drumming or shook authentic rattles to create music that was spontaneous and energizing. "It's good for our procedural and detail oriented brains to have some wide open creativity in whatever form." said Amelia Janes.

Workshops and Field Trips filled the remaining days. While the core conference provided back-to-back presentations and inspirational concepts accompanied by scribbled note-taking, and left us with mind-boggling take-home messages, the rest of the week allowed us to slow down and immerse ourselves in another aspect of education and inspiration. Some opted for intensive training in





digital and traditional illustration techniques. Others were absorbed into drawing live animals in the classroom and farmyard, or explored the countryside, concentrating on sketching and photography. These opportunities to hone skills with in-depth study provided learning opportunities often unavailable to members. They were very popular and filled up quickly. Comments extolling the benefits exemplify the quality of these workshops and field trips.

On the flight home, I reflected the same thoughts as my first conference, years ago. I was impressed with the collaboration and dedication to produce meaningful educational opportunities. The breadth of experience generously shared by our members continues to astound me. Conferences are one of the best ways to be more involved with the Guild, and we're always looking for more helpers with small, medium or large volunteer contributions.



GNSI Board at the Banquet, left to right: Vice-President Ikumi Kayama, Past-President Amelia Janes, Treasurer Karen Johnson, Education Director and President -Elect Sara Taliaferro, Outreach Director Diana Marques, Membership Secretary Daisy Chung, Recording Secretary Cheryl McCutchan, President Linda Feltner. Photo ©2017 Britt Griswold



Top Left: Vireo Sketch, digital, ©2017 Bruce Kerr

Top Right: The Silent Auction included pieces of last year's chalk murals. Photo © 2017 Taina Litwak.

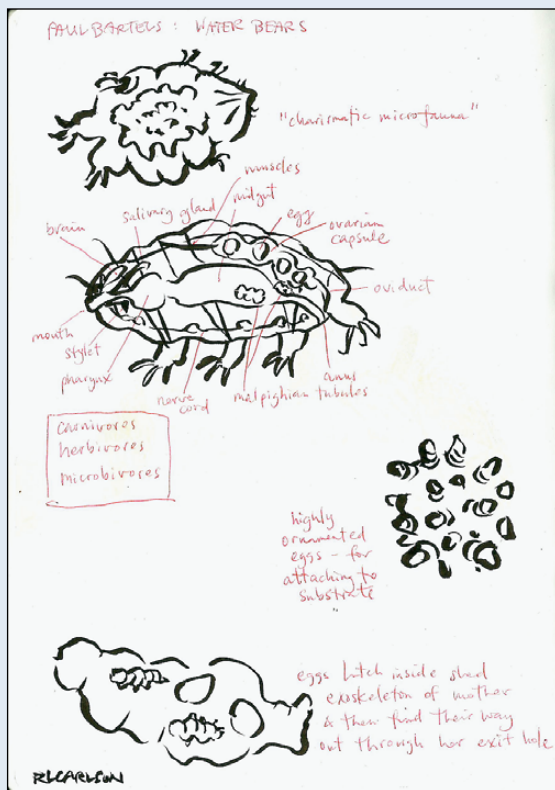


Left: Cthulhu Cap at the auction modeled by Lore Rutan. Photo courtesy of Marla Coppolino

Below: Drum circle party at the Pavilion. Photo ©2017 Carolyn Martel

Bottom Right: The drum circle. Photo ©2017 Britt Griswold





Above: Tardigrades;
©2017 Robin Carlson

COMMENTS FROM THE CONFERENCE:

Renderers of 3D Digital Virtual Heart, with David Mauriello

"It was incredible how much detail he was able to capture in his render, and I was especially inspired when he always over-renders his project beyond what his project requires so that the assets will become even more versatile if needed in the future.... It was interesting to learn that a lot of 3D animation skills also translate to the 2D animation that I am used to." — Daisy Chung

Creating the next generation of educational materials in a college of veterinary medicine, with Brad Gilleland

"The way that the VetLab uses computer technology for teaching is truly innovative.... They're working on a virtual reality walk-through of the circulatory system and developing methods to use Augmented Reality in laboratory settings." — Cheryl McCutchan

Painting with Colored Pencils, with Scott Rawlins

"I learned how to look at the subtle color changes on the surface of a bing cherry and try to discern how to convey that, and how to use those colors to expand the texture, contour, and intriguing depth of color to create a small illustration of one cherry that speaks volumes of what I was seeing and, while doing so, enjoyed and profited by every moment of it." — Trudy Nicholson

Photo microscopy water bear Lab, with Paul Bartels

"He is such an enthusiastic scientist and appreciator of the microfauna. His excitement and energy were contagious. In his talk, Dr. Bartels talked about how he works with his students to discover new species. What a wonderful experience for the students!" — Ikumi Kayama



Drum circle in the Pavilion after the banquet, inspired and organized by Paul Fetchco. Photo ©2017 Britt Griswold

Beyond Anatomy: Creating Creaturely Characters one can Believe In, with Terry Whitlatch

"She is an excellent and very personable speaker, and I was planning to attend her presentation regardless of whether it was a repeat of last year's or not – and it was not!" — Scott Rawlins

Live Birds in the Classroom (with Linda Feltner) and Live-and-(almost) Loose Animals (with Nancy Halliday)

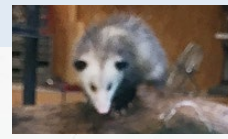
"I've been making a point of sketching every day since I came back and it is paying off already." — Lore Ruttan

"Live animals are great at reminding you that they are all individuals, and even the familiar can surprise you." — Valerie Hayes

"For me, it was a delightful experience to see up close so many fascinating and beautiful creatures and to marvel at so many artistic interpretations of them." — Nancy Halliday

Beautiful, Luminous Grays with Patricia Savage

"As a result, I've changed out some of the colors that I've been using in my sketching kit and it's been so much less frustrating!" — Karen Johnson



Top Right: Opossum sketch done in Live-and-(almost) loose animals workshop; ©2017 Jay Rasgorshak

Right: Blue Ridge Mountains ©2017 Karen Johnson

50th Anniversary Members' Exhibition

July 16, 2018 - Oct. 15, 2018

The GNSI 50th Anniversary Special Exhibition will be extraordinary!

The 2018 juried members' exhibition will take place in the prestigious exhibition gallery of the American Association for the Advancement of Science, the world's largest multidisciplinary scientific society! It will be on exhibit to the public for three months in the heart of Washington, D.C.

This year's message is: "The art of visualization and scientific inquiry are inseparable. Together they reflect the exponential growth of human knowledge." With your participation, the exhibition will be bigger, more diverse, and will work to connect the public with the artists and techniques behind the works. We're organizing our categories differently this year and we hope you'll submit your works in this exciting, highly visible, and unique anniversary exhibit!



Submissions accepted from February 1 – March 31, 2018
Enter your works online at: 2018.conf.gnsi.org/exhibit
Stay tuned for more details!





The Biodiversity Mandala Project

— Jennifer Landin



Top left: Initial mandala design

Right and far right: Conference attendees working on images for the mandala. Photos ©2017 Britt Griswold

Bottom right: Student volunteers, Nikki Knapp and Hylton Smith; photo by Jennifer Landin

Opposite page right: The finished mandalas

Opposite page bottom left: Mandalas at their unveiling on Friday night at the Asheville Museum of Science. Photo ©2017 Britt Griswold



Our 2017 GNSI conference collaborative project began with the goal of recreating the impressive murals undertaken at Santa Cruz. As I worked through the design, it challenged me with one problem after another until I learned the moral of this story: Know your strengths.

It began in January. I'd been so inspired by the Santa Cruz murals... and Warren Wilson College is home to an amazing professor who teaches and creates murals (those of you who attended saw many of the wonderful examples of her work). It seemed like an easy fit. I decided if I wanted a collaborative project so much, I would volunteer.

Problems started early. The art professor could not assist due to her teaching schedule, so I was on my own for designing the project. I tried to recreate the Santa Cruz murals with Appalachian species rather than sea creatures. It didn't work. Nothing worked. Until I realized my mistake... I was trying to create in someone else's style. Due to limited time, my work includes mostly small vignettes. If I want to produce larger work, I often combine small pieces rather than create larger ones. My supplies require little or no specialized equipment and transport easily (mostly pen and ink with dabs of watercolor). I'm unfamiliar with substrates that need preparation.

Then I remembered a project completed for my husband's blog last year (he writes about the impact

of birds in human culture). He wrote a series of eight posts on Birds and Religion. For each post, I drew a "pie piece" that came together to form a mandala at the conclusion of the project. Each was colored pencil on multimedia paper. What if I recreated this idea, but magnified by fifty?

I quickly and easily developed the designs for mandalas. I laid out a quarter of each piece, scanned and duplicated it to finish the mandala structure, then added guidelines for determining each piece's placement.

I printed the templates at full size and cut out all 104 pieces as templates for the multimedia paper base. Now we just needed to identify which species



should be included on each piece, and locate reference images. For this task, a numbering system was essential. I assigned each piece a number so we could place the template, paper, and reference images together. And a numbering system would ensure that all 104 pieces delivered to our talented artists could be reassembled into their proper places. Luckily, I had two student volunteers, Nikki and Hylton, who were a tremendous help in locating images and matching each piece with the species represented.

At the conference, the fun began. Everyone selected an envelope and began to draw. We quickly ran into our first issue: We had many pieces to draw and not enough artists! Even though the conference had a huge attendance this year, we'd scheduled the project for Sunday, before many people arrived. But GNSI members are known for pitching in. Some volunteered to do two pieces. Others grabbed an envelope for completion after the scheduled project time. And, as the finalized pieces flowed back in, the mandalas took shape.

I scanned in each illustration, piece by piece, and compiled them in Photoshop. Then I filled in missing sections with some judicious duplication, cleaned up the scans, and added some unifying elements. By the time I completed the first mandala, I knew we'd done something amazing. The completed mandalas were printed out on large format inkjet prints, mounted, and brought to the Asheville Museum of Science for a grand opening event on Friday night of the meeting week. We all had a great time admiring our work and taking pictures of each other playing in the museum exhibits.

What's next for the mandalas? The GNSI-Carolinas chapter met to fill in some of the holes with more original pieces; we're still finalizing those. Also, I'm having 100 of my students write up information on each and every species displayed in the mandalas. The goal is to set up an educational website with clickable mandalas that link to the artist's name, and information on each organism shown.



ILLUSTRATING NATURE:



Bearded Anole
© 2017 Alex Lebron

California State University Monterey Bay Science Illustration Program Exhibit

— Miranda Zimmerman

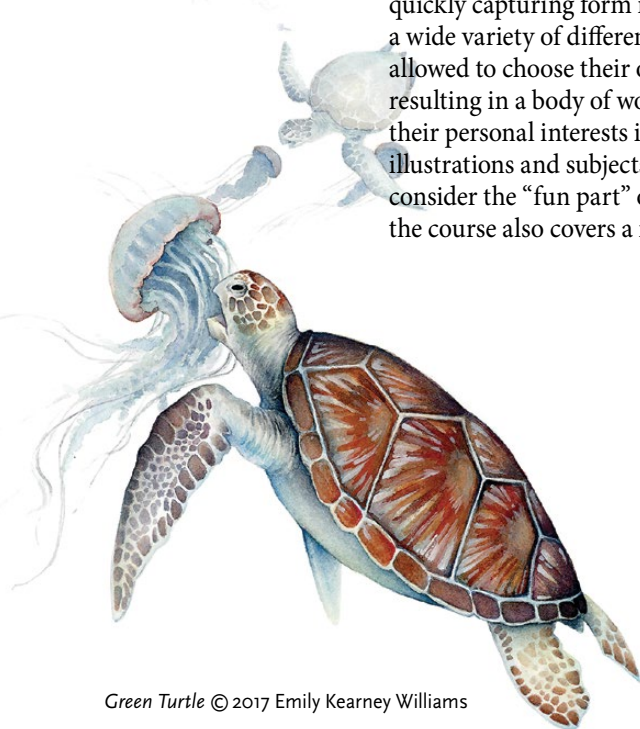
On May 5th, 2017, the annual Science Illustration show, *Illustrating Nature*, opened at the Pacific Grove Museum of Natural History to display the work of this year's fifteen Science Illustration Certificate students from California State University, Monterey Bay (CSUMB). The exhibit highlights the illustrations and infographics created by the students over the course of this demanding and prestigious one-year program. Each year, students are required to complete twelve rigorous science illustrations classes from September to June, lead by Ann Caudle, Jenny Keller, Amadeo Bachar, and Jane Kim. Then, they must arrange their own internships and complete ten weeks of work at an institution of their choice (this year, ranging from the Alf Museum of Paleontology in Los Angeles, all the way to China and the University of Queensland in Australia!).

The coursework begins with fundamentals, such as quickly capturing form in field sketching, and using a wide variety of different media. Students are allowed to choose their own subject matter, often resulting in a body of work that is tailored to their personal interests in the sciences. While the illustrations and subjects themselves may be what we consider the "fun part" of being a science illustrator, the course also covers a range of topics that are

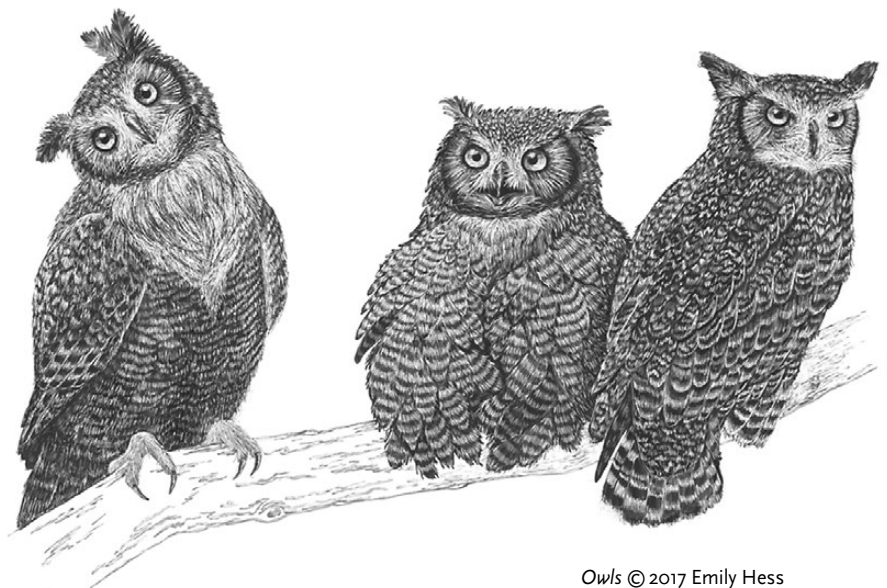
crucial for the aspiring professional. Guest speakers gave in-depth presentations on drafting contracts, copyright law, personal accounting, and more. CSUMB Science Illustration alumnus, Reid Psaltis, even came and gave a demonstration on building maquettes, which can then be used for lighting and pose references.

This year's students came from all different backgrounds across the United States and Canada to learn more about the field of Science Illustration and further their careers as illustration professionals. Their interests include paleontological reconstruction, whale biology, parasitology, entomology, and works that tackle the ever-growing issue of environmental conservation. Whether we realize it or not, we interact with science illustration almost daily to help further our understanding of the world around us. We are thrilled to see these contributions to the field as these fifteen students graduate from the program and begin their professional careers.

As always, special thanks go to the CSUMB College of Science and the College of Extended Education and International Programs, as well as the Pacific Grove Museum of Natural History for their support.



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Owls © 2017 Emily Hess



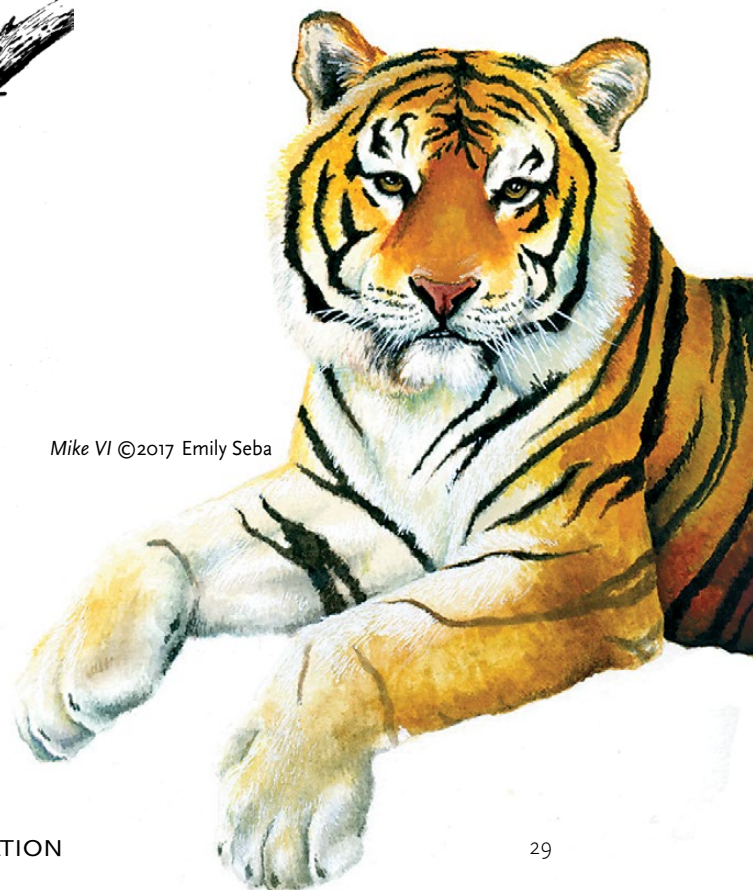
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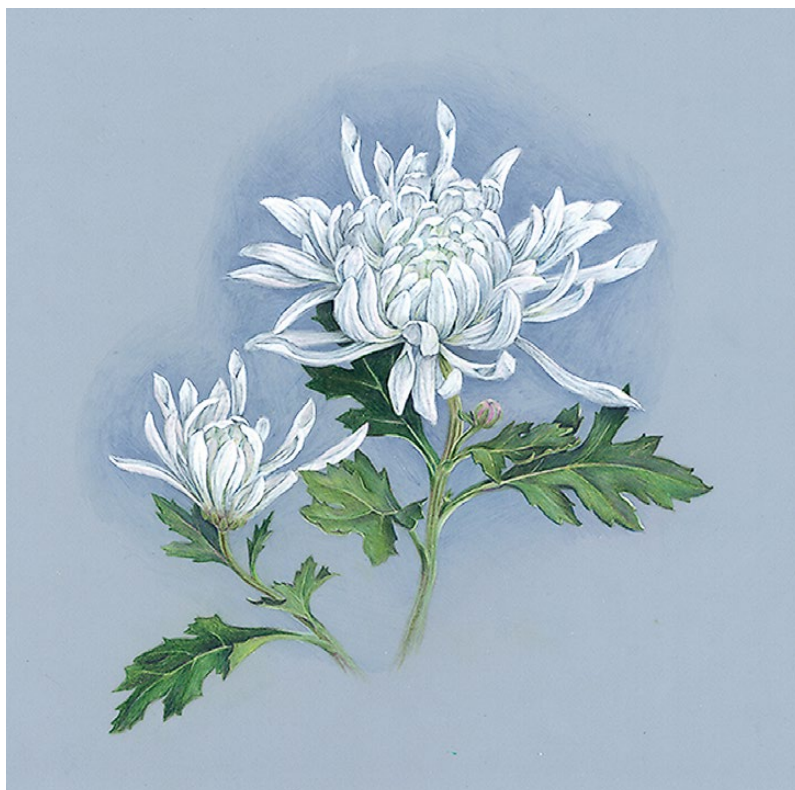
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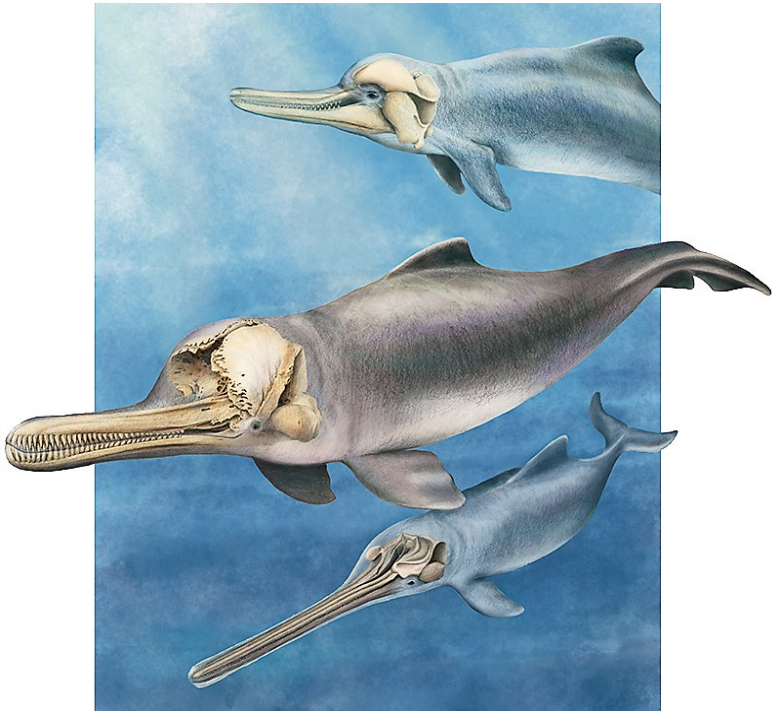


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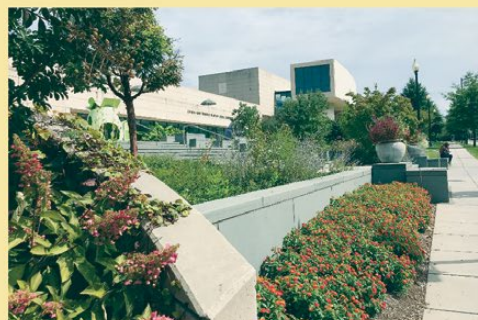
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