

Journal of NATURAL SCIENCE ILLUSTRATION

GUILD OF NATURAL SCIENCE ILLUSTRATORS



A Note From...

Clara Richardson, GNSI Journal Editor-In-Chief

Welcome to the first issue of the Journal for 2019. As often happens, this issue does a great job of reflecting our diverse interests. You'll find three very practical technique articles, two on traditional techniques for drawing and rendering, and an article on digital 3D modeling—essentially building a digital sculpture to use as the basis of a 2D illustration. We have a discussion on framing and shipping artwork, some GNSI chapter news, and an article on the natural history of the environs of Queensland that Geoff Thompson knows intimately from many years' worth of field trips. Get on Down Under!

We are thrilled to see the new Journal team coalescing and working together. You will see Camille Werther, Fiona Martin, and Caitlin O'Connell listed in the masthead to your right. It is a joy to see their creative solutions, attention to detail, and deep desires for quality—all of which are required to produce a Journal that reflects GNSI and that members have come to expect.

We can't do it without you. Send us your article ideas, your images, anything you can think of to further the conversation that is the heart of the Guild of Natural Science Illustrators. Maybe there's something you'd like to research and give a report on. We are more than happy to help you develop an idea and flesh out how to communicate it. We would also love your sketches, field journal spreads, and finished renderings to fill out issues as need be—and/or to illustrate a point you'd like to make!

— Clara Richardson
clara@illustratingforscience.com

CONTENTS

Editor's Note, by Clara Richardson	2
Non-Photo Blue Pencils, by Dino Pulerà	3–4
Unmasked: Masks in Traditional Art, by Marlene Hill Donnelly	5
A Special Place: Queensland, Australia, by Geoff Thompson	6–12
Brisbane 2019 Conference Preview	13–16
Grow Your Digital Plant, by Heno Hwang	17–21
RRRRIPPED from the List: Artwork Gallery Exhibition	22–25
Chapter Happenings: Carolinas Chapter, by Betsy Donovan	26–27
Join Us! Brisbane 2019	28

Cover: Partial dorsal view of a female stag beetle, *Australognathus munchowae* (Moore and Monteith, 2004). This species was known from just a female, found in 1973 on isolated Blackdown Tableland by a local schoolgirl, Elizabeth Munchow. Finally, in 1995, Queensland Museum's Geoff Monteith collected the first male on the Consuelo Tableland, another remote plateau 100 miles southwest of Blackdown. The party also collected many larvae, eight of which were reared to adults over the next four years. The new specimens enabled the new species to be described. Ink on scratchboard. © Queensland Museum, Geoff Thompson



The Guild of Natural Science Illustrators is a nonprofit organization devoted to providing information about and encouraging high standards of competence in the field of natural science illustration. The Guild offers membership to those employed or genuinely interested in natural scientific illustration.

GNSI GENERAL INFORMATION

MEMBERSHIP
U.S.: \$85 per year; Global: \$105 per year.
Other membership options are available.

CONTACT AND PURCHASING INFORMATION

BY MAIL OR PHONE:
Contact: Leslie Becker, Administrative Assistant
Ph/Fax: (301)309-1514, gnsihome@his.com
P.O. Box 42410
Washington, DC 20015

ONLINE:

Secure credit card transactions can be made through www.gnsi.org. Or send checks made out to "GNSI" at the above address. Please include your complete mailing address, phone contact information, and email.

WEB UPDATES:

Check the GNSI Home Page at www.gnsi.org for frequent updates. You can find announcements of members' accomplishments, Annual Conference information, Education Series workshops, and more. You can also update your membership information.

GNSI JOURNAL

Volume 51, Number 1/2019 • © 2019
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).

POSTMASTER: CHANGE OF ADDRESS

Send notices to: "GNSI Membership Secretary"
P.O. Box 42410
Washington, DC 20015

GNSI JOURNAL SUBMISSION REQUIREMENTS

www.gnsi.org/journal-requirements

GNSI JOURNAL STAFF

Editors-In-Chief: Gail Guth, Clara Richardson
Consulting Editor: Britt Griswold

This Issue:

Production Editor: Camille Werther
Layout Editors: Fiona Martin, Sarah McNaboe
Tech Editor: Caitlin O'Connell
Proofreading: Janet Griswold

Non-Photo Blue Pencils

— Dino Pulerà

Even though I've known about non-photo blue pencils for some time, I've only been using them to sketch for about four or five years since I discovered the artwork of John Muir Laws^{1,2}—and became more inspired after attending the 2016 GNSI Conference in Santa Cruz where John was a presenter. I really like the freedom to work rough and loose without later worrying about the blue lines competing with the final sketch. This allows me to keep my final sketch and rough sketches together, i.e., in my sketchbook instead of using a separate sheet of paper (and light box/pad) to create the final piece. You can then digitally remove the blue sketch with Photoshop as I learned from Ikumi Kayama's excellent demo on her YouTube channel. [The video is called *Photoshop Tutorial for Scientific Illustrators: Separating Out Non-Photo Blue from Graphite*. Here's the link: www.youtube.com/watch?v=nzuonxGd_Hc.]

Not all non-photo pencils are the same (Fig. 1). I tried a bunch and here's what I discovered. I started with the Prismacolor Col-Erase 20028 because that's the one John Muir Laws uses. I found the marks it left on the paper were too light for my liking. I also didn't like the tactile feel of pencil to paper because of the combination of somewhat waxy and hard (~H-HB) lead. When using gray-toned paper, I found the

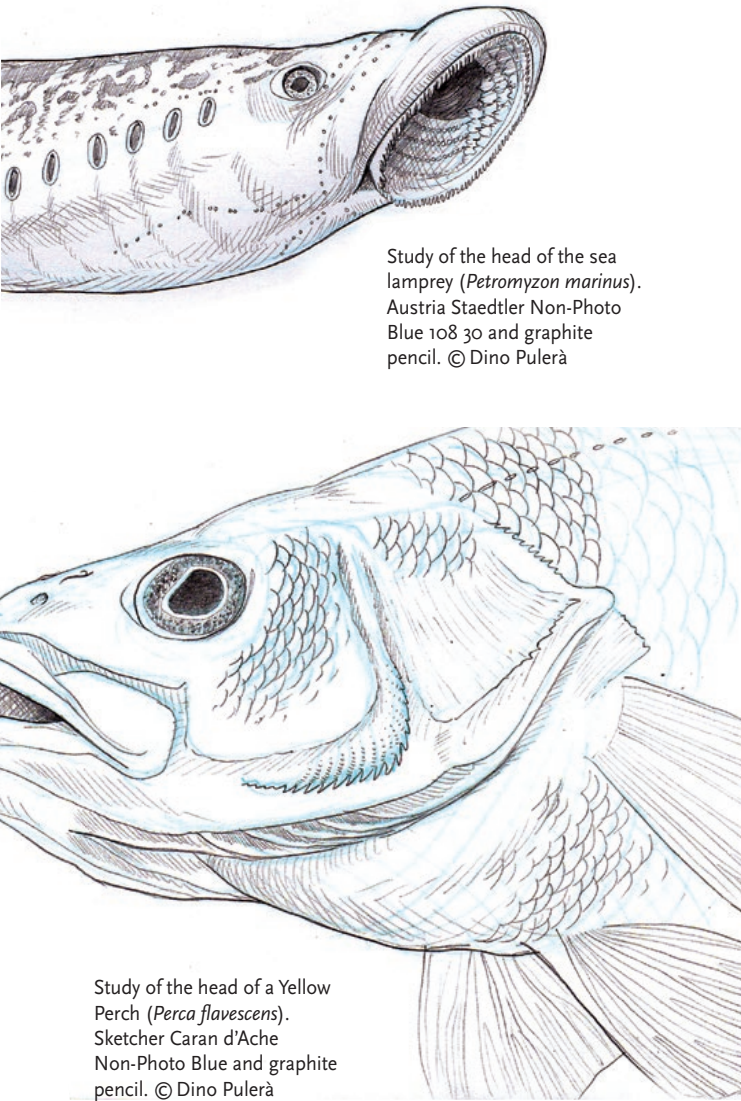
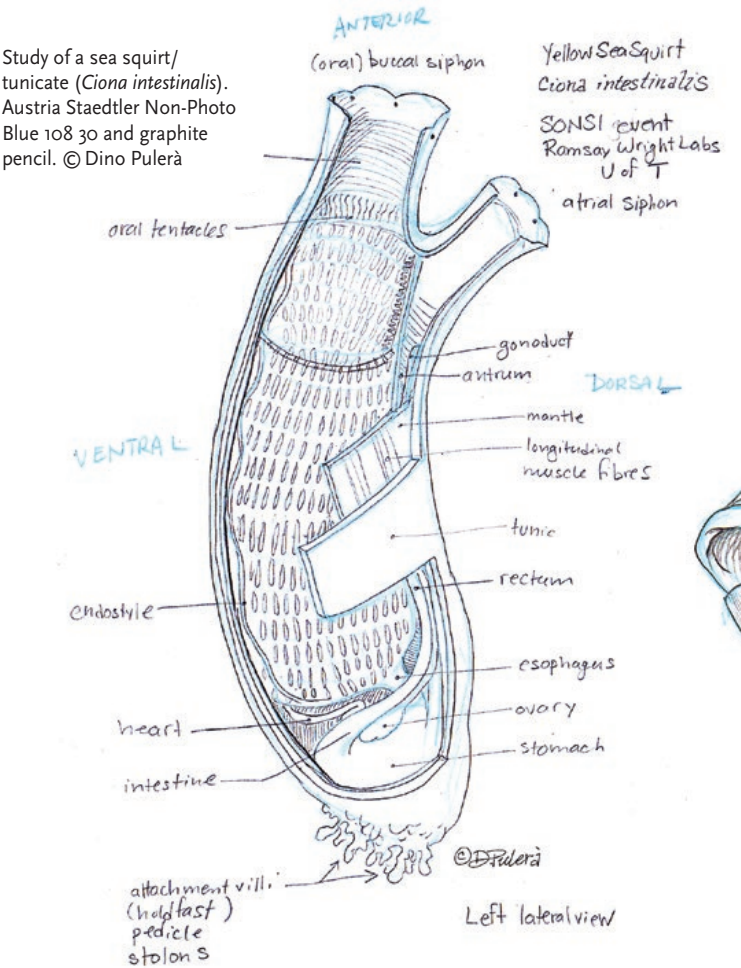
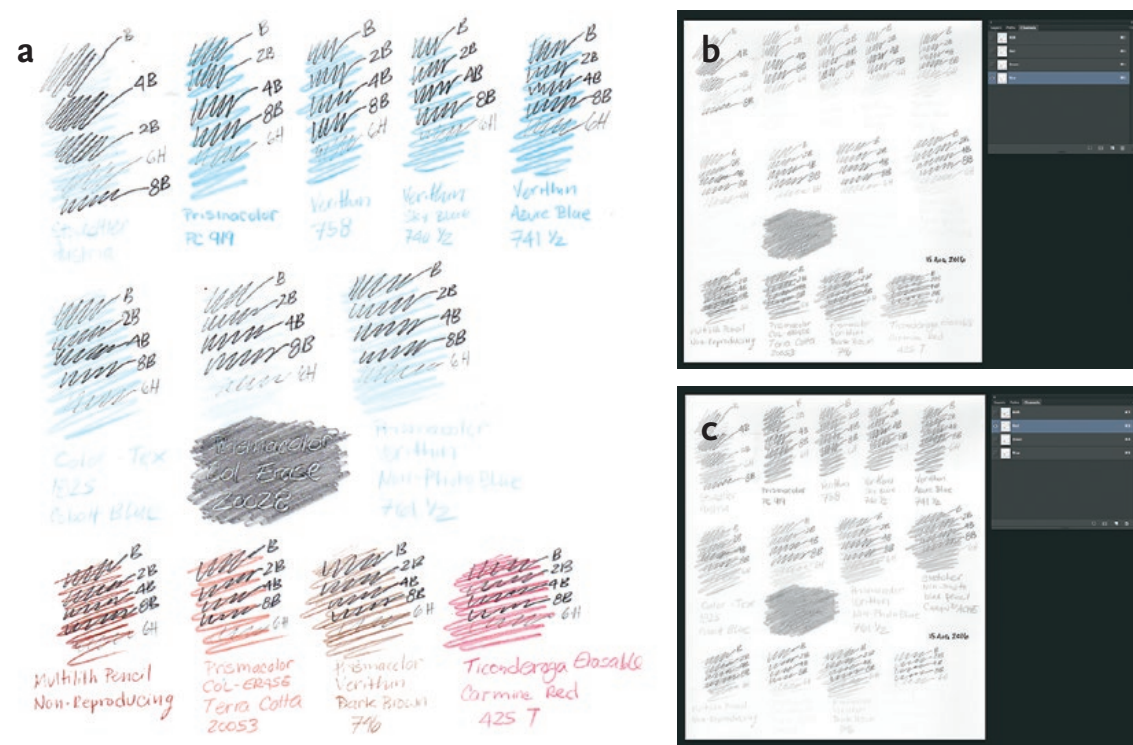
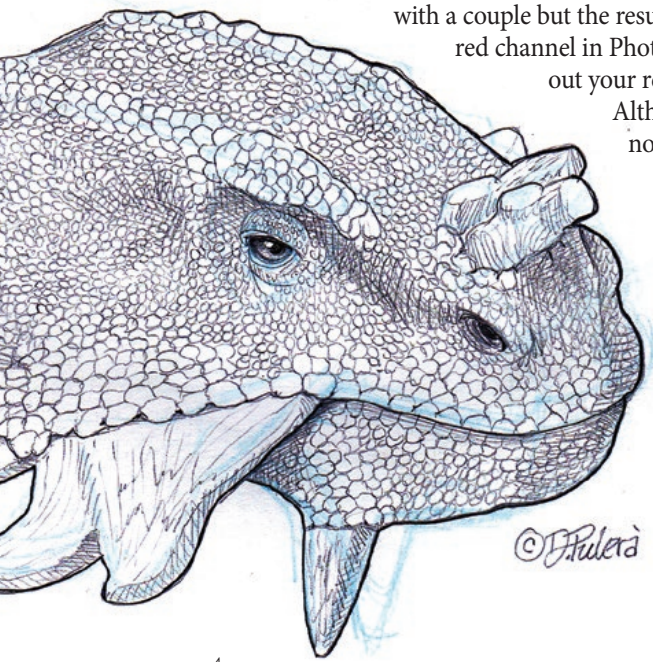


Figure 1: Different types of non-photo pencils. (Top to bottom) Prismacolor Col-Erase 20028 in Copy not NP Blue, General's Insoluable Color-Tex 1825 in Cobalt Blue, Prismacolor Verithin Bleu Inactinique 761 1/2 Non-Photo Blue, Prismacolor Premier Non-Photo Bleu Inactinique, Austria Staedtler Non-Photo Blue 108 30, Sketcher Non-Photo Blue Pencil by Caran d'Ache, Multilith Pencil Non-Reproducing, and Prismacolor Col-Erase 20053 in Terra Cotta.

Figure 2: (a) Comparing non-photo pencil lines with overlaying graphite pencil marks of various hardnesses. (b) Non-photo pencil test sheet with blue channel selected, i.e., blue lines filtered out. (c) Non-photo pencil test sheet with red channel selected, i.e., red lines filtered out.

THESE EXAMPLES of my sketches are unpublished studies which I created for the new edition of my book *The Dissection of Vertebrates, Third Edition*, published by Academic Press. I like to work out as much of the sketch as possible with a non-photo pencil before using a graphite pencil for a more detailed sketch/drawing.

Study of the head of *Scutosaurus*.
General's Color-Tex 1825 Cobalt
Blue and graphite pencil.
© Dino Pulerà



lines were almost impossible to see. But if you want your final sketch to clearly shine through your rough construction lines then you'll probably like this pencil (Fig. 2).

On the opposite end, I really enjoyed the tactile feel of the Sketcher and Staedtler because of their soft leads (~B–2B hardness range) and smooth application on white and toned paper. The trade-off is a more prominent blue under drawing. This is purely aesthetic because the non-photo blue can be removed digitally (Figure 2a and b). If you prefer a warm under drawing you have the option using non-photo red/brown pencils too. I've only experimented with a couple but the results are the same. Use the red channel in Photoshop to remove or filter out your red sketch (Fig. 2a and c).

Although I like using several non-photo pencils, the one I

liked the most is the General's Color-*Tex* because of its combination of lead hardness (~HB-B), erasability, and intensity of blue.

All the non-photo pencils I tested performed well in Photoshop when their color was filtered out. The only difference would be your preference of the look and the feel of the pencil on the paper you are using. Try a non-photo pencil and have some fun!

Footnotes

¹ Muir Laws, John. *The Laws Guide to Nature Drawing and Journaling*. Heyday, 2016.

² Muir Laws, John. *The Laws Guide to Nature Drawing Birds*. Heyday, 2015.

Dino Pulerà

Dino was born and raised in Toronto, Canada. Growing up he had a passion for art, science, and nature. He pursued his undergraduate and graduate studies at the University of Toronto, receiving a BS in Zoology and an MS in Biomedical Communications. Dino is a medical illustrator by day and a natural science illustrator by night specializing in animal anatomy and paleontology.

www.dinopulera.com

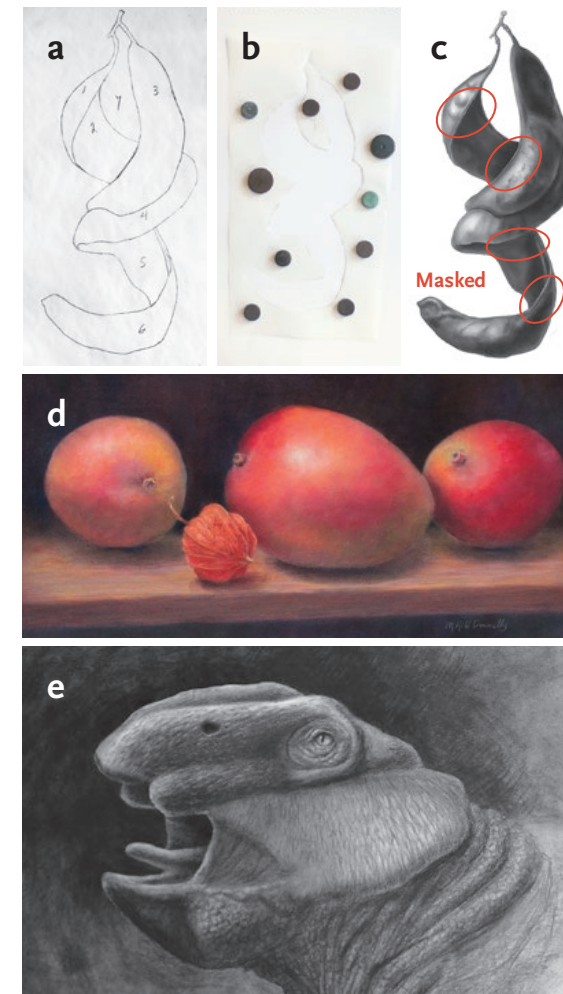


Unmasked: Masks in Traditional Art

— *Marlene Hill Donnelly*

We all recognize the essentialness of masks in Photoshop®, but their value in traditional art is perhaps (oddly) more obscure. The use of masks (or friskets) has a venerable history reaching back to the handprints found in 40,000-year-old caves. It has been used in many, many forms since then. In today's traditional media, masks are employed in graphite, carbon dust, pastels, and even oils.

The greatest advantage of masking is that it gives the sharpest, cleanest, fastest edge possible. An enormous amount of time is required to duplicate the effects of a mask using any other approach (e.g., a pencil point). How do you want to spend your time?



Above: (a) Pencil drawing of *Gleditsia triacanthos* seed pods. (b) Mask held with magnets on galvanized steel. (c) Carbon dust drawing of *G. triacanthos*, with masked areas circled in red. (d) Three mangos and *Physalis* rendered in pastel with masks. (e) *Sanguisaur* rendered in charcoal with masks. Panels a–c © 2018; panels d–e © 2017 Marlene Hill Donnelly

TRADITIONAL MEDIA MASKS

General materials

Pencils
X-acto® knife or scissors
Ordinary drawing board or galvanized steel drawing board with small magnets

Masking material options

Tracing paper
Glassine
Polyester drafting film (thinnest possible)

Process

1. Render the work conventionally to the point that it is about 80–90% finished. Usually masking is part of the finishing process.
2. Study your work early and decide on your center of interest—not necessarily an object but an area where you want the viewer's eye to focus first. Make sure it falls within a compositionally appropriate area, as in one of the line intersections of the “rule of thirds”. Masks will be used here to create the sharpest edges with greatest contrast.
3. Trace your mask carefully on a thin transparent material positioned on top of your work. You can use tracing paper, glassine, or polyester drafting film (durable and good for a large work where masks will need to be taken on and off repeatedly). Be careful, if the material is too thick it will leave an unwanted line. Test first.
4. Cut out individual masking elements with an X-acto knife or good quality scissors (after removing from your original work). With drafting film you can even use an extra-fine pyrography tool to burn through it—use this on top of glass. In any case cut carefully. Cutting = precise drawing!
5. Number mask pieces as you go to coincide with a numbered drawing, if your work is complicated.
6. Position the cut mask on top of your nearly-finished work. Depending on the work, you can hold the mask down with a finger. If you get serious and have a large number of masking elements, you may want to make a drawing board out of galvanized steel, cut to size by your hardware store. Then you can secure the work to the galvanized steel and hold the mask down with small magnets. Either way, position the mask carefully.
7. Begin the process, positioning your pencil or loaded brush on top of the mask and smoothly pulling it onto the drawing surface. If you are using a brush (for carbon or pastel dust), make sure to keep the angle very flat and press fairly hard.
8. Lift the mask frequently to make sure you're getting the effect you want.
9. Soften a too-sharp edge with a clean brush.
10. Eraser masks can be equally important. Use them the same way: with the mask in place use a kneaded eraser at the edge to clean up a drawing on white paper or to create a sharp light edge.
11. Save both parts of the mask, positive and negative; you never know when you will need to work both on subject and background.
12. Free form masks—it is not always necessary to cut a new mask specific to your drawing. A drafting film mask akin to a French curve (but more variable) may suffice for a wide variety of shapes. Make several and keep them handy.



A Special Place: Queensland, Australia

— Geoff Thompson

I was there when a new species of frog was discovered. I backpacked up rainforested mountains, went for five-day walks through pristine country, heard the calls of now-extinct frogs, helped discover and draw many new species, and heard experts point out and explain special biological treasures.

Trying to give an outline of the natural history of my vast home state is a daunting task for anybody. I am no expert but have had the privilege of working with experts for many years and of participating in fieldwork in many out-of-the-way places. There are vast areas and whole ecosystem types I have never visited, so this will be a personal view.

Queensland is huge. Most people live along its 1,720-mile eastern coast. Brisbane, its capital city, is in the southeast corner of the state. The total land area is approximately 666,800 square miles. The Great Dividing Range runs all along the east coast, with its highest mountains (Mount Bartle-Frere, 5,285 ft, and Mount Bellenden Ker, 5,226 ft) in the Wet Tropics. The mountains and plateaus of the Great Dividing Range are cooler and wetter than the surrounding

lowlands. They act as refugia for plants and animals that evolved on the ancient southern supercontinent, Gondwanaland, which began to break up 180 million years ago. There are significant rainforest mountains in the north centered around Cairns, central Queensland near Mackay, and in the southeast around Brisbane. Fossils show much of Queensland was covered by rainforest in the past and that our surviving rainforests are relatively small remnant islands on our dry continent.

WET TROPICS SUMMIT EXPEDITIONS WITH GEOFF MONTEITH

Many of the plants and invertebrates on the tops of these rainforested mountains have their nearest relatives in Chile, New Zealand, or New Caledonia. Insects in these refugia were of special interest to Geoff Monteith, my boss of almost 25 years at the Queensland Museum (herein referred to as QM). Less than

a third of Australia's insects are described, and Geoff is one of our great collectors.

In 1981, the year before I started work for him, Geoff mounted a 3-week Earthwatch expedition to Mount Bellenden Ker. Utilizing the cableway which services the television station on the summit, teams of volunteers collected insects, spiders, and land snails. About 5,000 species of insects were collected, including 1,500 beetles. At the time only 20% of those beetles were named.

Over a 13-year period I helped with surveys of most of the peaks between Cooktown and the southern state border. At the height of our collecting effort we were labeling up 30,000 pinned specimens per year. The collection has now been studied by scientists all over the world and new species will continue to be named from it for many years to come.



Opposite page: (top left) Looking at Mt. Bellenden Ker, Queensland's second tallest mountain, from a cane farm near its base. (top right) The author, Geoff Monteith, Jamie Seymour, and ANZSES volunteer, Alex, on a summit near Mossman Gorge, 1988. (bottom) Fan palms, *Licuala ramsayi*, © Geoff Thompson.

On this page: (top left) Mahogany glider, *Petaurus gracilis*, an endangered gliding possum. (top middle) *Tecomanthe burungu*, newly described and published in 2018. (top right) Schools of fish over stony corals at MacGillivray Reef, Lizard Island. © QM, Gary Cranitch. (left) The author, Geoff Monteith, Heather Janetzki, and Jamie Seymour at the bottom of Walter Hill Range after a particularly difficult ascent through cyclone-damaged country. The long blue socks lessened the pain of our badly-scratched legs.

All images © Queensland Museum (QM), Geoff Thompson, unless otherwise noted.

Because of his massive collecting and sorting efforts, Geoff has been honored with over 240 patronyms (i.e., species and genera named after him). I have been honored by 12 species named after me individually, all but the first one because of participation in Geoff's collecting efforts. We were both delighted when Martin Baehr named a small carab beetle after us both, *Amblytelus geoffreyorum* Baehr, 2004 (the species name meaning the plural of Geoffrey).

As we staggered up these mountains, often with 40 pounds on our backs and cutting our way through with secateurs (pruning shears), Geoff would point out plants and animals of special interest. He told the story of the Victorian colonial botanist, Baron Ferdinand von Mueller, who, when sailing down the coast en route to Melbourne, wrote "When in 1855 [I] saw... the bold outlines of Mount

Bellenden-Ker, the highest mount of tropical Australia, towering to 5,000 feet, [I] was led to think, that the upper region might prove to be the home of species of *Rhododendron*... forms of plants characteristic of cool Malayan sylvan [i.e., forested] regions." Some 32 years later an expedition led by William Sayer, on von Mueller's behalf, did indeed find a native rhododendron growing on the summit of Mount Bellenden Ker. Von Mueller named it *Rhododendron lochae* (later corrected to *R. lochiaie*).¹

My first field trip to the Wet Tropics was in October 1982 when Geoff led a Queensland Naturalists' Club expedition to Cape Tribulation. I think we climbed Mount Sorrow three or four times in a week and once we walked all the way to the Upper Roaring Meg Valley near the base of Mount

Pieter Botte. As well as rhododendron, Geoff pointed out many plant treasures:

- *Tecomanthe burungu*, a beautiful vine with large pink flowers. Another species, *T. hilli*, grows on Fraser Island and other places in southern Queensland. Species of *Tecomanthe* also occur in Indonesia, New Guinea, and New Zealand. Although known for many years, *T. burungu* was only recently described, published in 2018.²
- *Paphia meiniana*, formerly *Agapetes meiniana*, a rainforest shrub (on rocks) or vine (in forest) with tubular pink flowers and relatives in the Himalayas, similar to *Rhododendron* spp.
- *Gymnostoma australianum*, a living fossil known as the Daintree pine but an angiosperm related to Casuarina, found



only in upland rainforest in the Daintree region. Other species are found mostly at high altitude from Burma through to New Caledonia, which has eight endemic species. *G. australianum* grows in profusion along Upper Roaring Meg Creek, on and around granite boulders.³

- ***Drosera prolifera***, the trailing sundew; these carnivorous plants were growing in small meadows close to Roaring Meg Creek. The species is restricted to the Thornton Peak–Mount Sorrow massif.
- ***Lenbrassia australiana***, a small tree or shrub with yellow tubular flowers, the only species in the genus.
- ***Borya septentrionalis***, the resurrection plant, was growing on rock pavements near Roaring Meg and Mount Pieter Botte. The plant resembles a small grass tree and indeed is related. It goes orange under water stress and made a spectacular sight against the black rock pavements.
- ***Oraniopsis appendiculata***, bronze palm, a slow-growing palm only found at higher altitudes. Often we would see a root spiraling round the trunk with the end in the leaf-litter humus at the base of the fronds. The palm doesn't start a trunk for many years. So the palms and spiraling roots we saw that were a couple of meters high were very old.

Above: (left) Daintree pine, *Gymnostoma australianum*, growing on granite at Upper Roaring Meg Creek, 1982. (top middle) Living fruit of *G. australianum*, © Geoff Thompson, compared to (bottom middle) fossil *Gymnostoma* fruits from Makowata, via Lowmead, Lomead Formation, Eocene. (right) Southern cassowary, *Casuarius casuarius*, © QM, Gary Cranitch.

There are plenty of high-altitude vertebrates too, like the tooth-billed cat bird, *Scenopoeetes dentirostris*, and golden bowerbird, *Amblyornis newtonianus*. The tooth-billed cat bird or "stagemaker" is a type of bowerbird that clears a display court or stage on the rainforest floor and decorates it with the white undersides of large leaves he cuts off with the tooth in his bill. The golden bowerbird is our smallest bowerbird. The male builds the largest bowers, constructed of many sticks joining two small trees; the bower is decorated with moss and small flowers.

We were looking for high-altitude, mostly flightless insects. Geoff is a specialist in the Aradidae, flat bugs or bark bugs. He also has strong interests in native dung beetles (Scarabaeinae), ground beetles (Carabidae) and a more general interest in building up collections of all sorts of rainforest insects. Among the high-altitude prizes in the Wet Tropics were moss bugs (Peloriidiidae), a large stag beetle with relatives in southern Queensland and South America, *Australognathus queenslandicus* (Lucanidae), large flat bugs in the genus *Kumaressa* (Aradidae), a blind terrestrial water beetle, *Paroster caecus* (Dytiscidae) that lives in the

wet leaf litter, a wingless terrestrial water bug, *Austrovelia queenslandica* (Mesoveliidae), flightless, primitive leafhoppers *Myerslopella* spp. (Cicadellidae), cockroaches of the genus *Tryonicus* (Tryonicidae) and tiny arboreal ground beetles, *Philipis* spp. (Carabidae). Some larger insects were caught by hand but the bulk were collected in traps or small-scale pyrethrum knockdowns and only sorted out by Geoff after long hours at the microscope.

DAINTREE LOWLANDS

The lowland tropical rainforests of Cape Tribulation harbor their own treasures. They are believed to be a remnant of the cradle of angiosperm evolution and have some very special plants. *Idiospermum australiense*, best known is the "green dinosaur", is a tree of ancient lineage most easily recognized by the huge seeds germinating around its base.⁴

There is a profusion of other plants. The beautiful fan palms, *Licuala ramsayi*, are most noticeable. They can form incredible forests 40 feet high, with their huge leaves filtering the light like a green cathedral. I was once lucky enough to see a southern cassowary dad, *Casuarius casuarius*, with two striped chicks on a ridge in such a forest. These huge,

endangered, flightless birds are an essential disperser of many rainforest seeds.

In the understory you will often see native gardenias, then *Randia*, now named *Atractocarpus hirtus*. Often the ground is almost covered in club mosses, *Lycopodium* spp. The small evergreen cycad, *Bowenia spectabilis*—once used to decorate butcher shop windows—brightens the gloom. Burrows are excavated into termite nests on the forest floor by buff-breasted paradise kingfishers, *Tanysiptera (Uralcyon) sylvia*, to make their nests. Every fallen nut of the Atherton oak, *Athertonia diversifolia*, on the forest floor has been chewed by giant white-tailed rats, *Uromys caudimaculatus*, and equally large bandicoots are common. One found my pack (left after descending the mountain) and made quite a mess of it, while extracting a candy bar.

Of course there are plenty of other lowland vertebrates. Most notable is the amethystine python, *Morelia amethystina*, Australia's largest snake which grows to five meters. On a horseriding excursion in the Daintree, my wife's mount calmly stepped over one, something that would normally totally freak out a horse. Colorful Boyd's forest dragons, *Lophosaurus boydii*, are sometimes seen carefully positioned to blend in with sapling trunks.

Climbing plants abound, especially on the edge of rainforest clearings. Most noticeable is the native monstera, *Epipremnum pinnatum*. Less friendly are the three species of lawyer cane, *Calamus australis*, known as "hairy Mary", *C. moti*, known as "lawyer cane", and *C. radicalis*, known as "vicious hairy Mary". These climbing palms have whip-like tendrils and vicious spines. Their stems were once harvested for rattan cane, with which children of my era were beaten at school. Another notable climber is the matchbox bean, *Entada phaseoloides*, which has large long pods. Early settlers made matchboxes from the large smooth seeds. They float down the coast and wash up on the shores of Stradbroke Island near Brisbane, where a local aboriginal artist collects them.

Common along the beach front is another climber, *Salacia chinensis*, which the locals call "snotty gobbles" because of the texture of the flesh of its edible fruit. These fruit play host to

the larvae of a beautiful, long-tailed lycaenid butterfly, *Bindahara phocides*, the sword-tailed flash. Trees grow up to the high-tide mark, with branches hanging further over, and because of the high rainfall epiphytic ferns and orchids festoon these. The largest trees are *Calophyllum inophyllum*, Alexandrian laurel. The late Betty Mackenzie told us the genus name means "beautiful leaves" and they sure are, with their lovely parallel-ribbed structure and glossy green color.

SNORKELING THE GREAT BARRIER REEF

On holiday trips to Cape Tribulation I have twice taken snorkeling trips out to Mackay Cay from the beach. The reef is a whole different environment I don't know well. I remember the beautiful mantles of the giant clams, electric-blue staghorn corals, giant coral bommies (coral columnar structures higher than surrounding reef), and many-colored fish, all accompanied by the distinctive underwater sounds of snapping shrimp clicking their claws and parrot fish noisily munching on coral.

OTHER PARTS OF THE WET TROPICS

Not far south of the Daintree River and still in the Daintree National Park, lies the Carbine Tableland. Most visitors know the famous Mossman Gorge but rarely venture far from the fabulous swimming holes. Three times we climbed the peak on the southern side of the gorge, Mossman Bluff (4,364 ft), and also the one on the northern side, called Devil's Thumb by the locals. Official maps wrongly attribute this name to Mossman Bluff.

On one trip with ANZSES (Australian and New Zealand Scientific Exploration Society) we came in from multiple directions, driving up to old tin mining areas on the western side as well as the two eastern ascents. Later a party of young volunteers stumbled on an unknown WWII plane wreck with 16 skeletons. An Air Force recovery team retrieved all human remains and they were buried with full ceremony.

The following season we went on a five-day walk right round the back of the gorge through an unbroken rainforest wilderness. I particularly remember the giant leptospermum trees, *Leptospermum wooroonooran*, in flower on the bluff, their white blossoms contrasting nicely with the red rhododendrons.



Above: (top) Alexandrian laurel, *Calophyllum inophyllum*, growing on Cape Tribulation Beach. (bottom) Some of its young "beautiful leaves." © Geoff Thompson

The southern part of this tableland includes Mount Lewis, the only place you can drive to such high-altitude rainforest and well-known for its special creatures.⁵

South of Mount Lewis and almost directly west of Cairns, lies the Hann Tableland National Park. This is a drier area than most we surveyed. I recall Geoff finding what turned out to be a new species of giant cockroach in wild pig droppings, large clumps of ferns ringing the trees, and catching large tiger beetles on those trees. The trip mostly stands out in my memory because of an encounter with a large coastal taipan, *Oxyuranus scutellatus*. It possesses the third-most toxic land snake venom known. This one was about three meters long and thick as my arm. It came at us but we managed to avoid it and no one was bitten. I only ever had one other encounter with a taipan on a disused road in the Cardwell Range—though that time the snake struck three times and I was lucky to avoid being bitten.⁶

We also took many trips to the rainforests further south, including three ascents of the Walter Hill Range near Tully. There a notable primitive cave spider, *Macrogradungula*

moonya, was discovered amongst boulders near the summit. On one trip we were off course and had to camp on a saddleback near water. I was cooking dinner and looked up thinking “Gee, the stars are bright!” Then I realized I was looking at the hillside and they were glow worms, mixed with luminescent fungi. Then the fireflies came out! It was like a fairyland.

Another notable trip was to Mount Elliot, south of Townsville, known for its magnificent, endemic carab beetle, *Nurus rex*. We spent five days on that mountain, most of it in driving rain.

During an ascent of Walter Hill Range in 1989, we had to make a dry camp at 800 meters due to slow going from cyclone damage. I remember later getting a good view of a rarely-seen tree kangaroo on the canopy below a bare fern path. Meanwhile our QM colleagues were working down in the lowland open forests, following a series of clues to the rediscovery of the mahogany glider, *Petaurus gracilis*, described in 1883 from a skin by then QM Director, Charles de Vis, and not seen again till that trip.

KROOMBIT TOPS

My very first field trip with the QM was to a place much further down the coast, 37 years ago now. It was to Kroombit Tops, a cool sandstone plateau behind the coastal city of Gladstone. On a subsequent trip with the Queensland Naturalists’ Club to the same locality, a colleague, Greg Czechura, heard a frog calling from under a rock shelf on a creek. He instantly recognized the call as that of a new species of torrent frog. He later described it as the Krombit tinkerfrog, *Taudactylus pleione*, sadly no longer found where we first heard it. It survives on the steep escarpment nearby and is listed as critically endangered.

Many other interesting species have their northern limits on this temperate island in the subtropics. I particularly remember collecting giant water spiders in the creek with the late Valerie Davies, and inadvertently killing a red-bellied black snake when I rolled a log looking for insects. In an open forest nearby, we found another log full of adults and larvae of a new stag beetle, *Safrina jaedoni*. This collection extended the known range of the genus 400 kilometers north. I later had the



Above: (top) Giant *Leptospermum* trees, *Leptospermum wooroonooran*, in flower on Mossman Bluff. (bottom left) Coastal taipan, *Oxyuranus scutellatus*. © QM, Jeff Wright. (bottom right) Geoff Monteith and the author, still smiling at the start of five days of rain on the summit of Mount Elliot, 1986. © QM, Simon Hamlet.

pleasure of illustrating one for the cover of *The Queensland Naturalist*. The sharp eyes of club members also allowed us to see a greater glider, *Petauroides volans*, close to camp—a sight I will long remember.

THE GREAT SANDY ISLANDS AND THE SOUTHERN COAST

Gladstone pretty much marks the most southerly extent of the Great Barrier Reef. Further south the coast offers other extraordinary features. Much of the mainland coast is still protected from the waves, in this area, by great sandy islands. These comprise, north-to-south by their European names: Fraser Island, Bribie Island, Moreton Island, and Stradbroke Island. Stradbroke was once whole but in 1898 a storm broke through at Jumpinpin, creating North and South Stradbroke Island.

Fraser Island is the largest sand island in the world, 70 miles long with 40 freshwater lakes and patches of rainforest growing in sand. In the rainforest near the old Central Forestry

Station, Wanggoolba Creek flows clear and silent on a sandy bed it has washed clean of humus. The white sand is tinged green by the filtered rainforest light. Other famous natural attractions include the crystal clear Lake McKenzie, the equally clear Eli Creek (which pours 4,000 liters of freshwater into the Pacific Ocean every hour), Lake Wabby (formed by the damming of a creek with a sand blow), and the colored sand cliffs of the Cathedrals.

The island is also famous for its dingoes (native dogs) probably introduced to Australia about 4,000 years ago but possibly up to 18,000 years ago.⁷ On Fraser they haven’t interbred with domestic dogs, unlike on the mainland, and are protected. They can be aggressive. A six-year-old boy was bitten on the leg recently while holidaying on the island. Another boy was killed and his brother seriously injured on the island in 2001.⁸

Just south of Fraser Island is a similar sandy wilderness on the mainland called Cooloola

National Park. This region was saved from development after a long campaign in the 1960s and ‘70s started by a botanical illustrator, Kathleen McArthur.⁹ The heathlands of these sandy areas are famous for their wildflowers in the spring.

In the late 1970s Geoff Monteith led a hunt for the Cooloola monster, a strange flightless cricket that spends most of its life underground. It was so strange it was initially described as a new family. Subsequently seven more species have been discovered in other areas of sandy soil, in varied situations from a national park tableland to sugar cane paddocks. Four of us once spent 20 hours digging for a then new species on South Percy Island, a much smaller sandy island southwest of Mackay. This island is the only place I’ve ever been in Australia where we didn’t see any introduced honey bees. The profusion of native insects on the native blossoms was extraordinary.

GREATER BRISBANE

Brisbane and its environs boast many interesting places too. The scenic rim of ranges is covered in eucalypts and large patches of rainforest. The large tidal Brisbane River flows into Moreton Bay, which is protected by Moreton and Stradbroke Island and peppered with many smaller islands. A cruise in the bay to see dolphins, dugongs, and whales is highly recommended, as is snorkeling near the wrecks at Tangalooma on Moreton Island. Stradbroke Island is the most developed large sandy island. It has been damaged by sandmining in the past but is still beautiful. Humpback whales are commonly seen in winter migrating up the coast. Dolphins are also very common. I remember being shown the now rare swamp orchid, *Phaius australis*, by the late Jeanette Covacevich. An extremely rare mammal on the island is the water mouse, *Xeromys myoides*, which builds giant nest mounds in mangroves near Myora Springs on the northwestern shore.

Brisbane itself has quite a bit of wildlife. I have, on rare occasions, seen several koalas, *Phascolarctos cinereus*, and on one occasion, an echidna, *Tachyglossus aculeatus*, in remnant bushland within ten minutes’ drive from our house. Once there was a koala in the carpark of the local farmers’ market, but



The author’s drawing of the Kroombit tinkerfrog, *Taudactylus pleione*, (Myobatrachidae). Ink on scratchboard. © 1986 QM, Geoff Thompson

the city is changing all the time. Our suburban garden used to have smaller birds such as brown honeyeaters, *Lichmera (Lichmera) indistincta*, and scarlet honeyeaters, *Myzomela (Myzomela) sanguinolenta*, now and then. The native but very aggressive noisy miners, *Manorina (Myzantha) melanocephala*, have driven them away. The strange brush turkey, *Alectura lathami*, which lays its eggs in enormous mounds of leaf litter, has invaded Brisbane gardens in the last 20 years, to the chagrin of fussy gardeners.

South of Brisbane on the state border with New South Wales, Lamington National Park preserves the largest area of subtropical rainforest in Queensland and is famous for its wildlife, ancient trees, and great scenic beauty. There are two entrances to the park with guesthouses at each: Binna Burra in the east and O’Reilly’s in the west. High-altitude Antarctic beech forest is another ancient remnant of Gondwana, sheltering primitive insects like the local species of moss bug, *Hackeriella veitchi*. Giant pink-barked brush box trees, *Lophostemon confertus*, may be up to 1,500 years old. 245 species of birds are known from the park.¹⁰ Visitors happily feed crimson rosellas, *Platycercus elegans*, and king parrots, *Alisterus scapularis*. Black and gold regent bower birds, *Sericulus chrysocephalus*, are commonly seen from O’Reilly’s café. Satin bowerbird, *Ptilonorhynchus violaceus*, builds its bowers close to the guesthouse. The call of the green catbird, *Ailuroedus crassirostris*, is commonly heard in the forest. I recall once

walking back up a 500-meter ascent with a colleague, to be rewarded with the best sighting of an Albert lyrebird, *Menura alberti*. Large Prussian blue and cream freshwater Lamington spiny crayfish, *Euastacus sulcatus*, are sometimes encountered on the track quite a way from water or seen in the clear streams. Red-necked pademelons, *Thylogale thetis*, small wallabies, are commonly seen too.

OTHER SOUTHERN NATIONAL PARKS

Other large, notable national parks within a day’s drive of Brisbane include the granite country of Girraween National Park and the ancient pine forests of Bunya Mountains National Park. Both have special flora and fauna, well worth exploring. Bunya pines, *Araucaria bidwillii*, belong to the ancient family Araucariaceae, a Gondwanan relic. Hoop pines, *Araucaria cunninghamii*, are native to southeast Queensland. Both bunya and hoop pines are in the same genus as the famous monkey puzzle tree, *Araucaria araucana*, native to Chile. *Agathis* is the other genus in this family, native to Queensland. The species *Agathis robusta* is the Queensland kauri, well-known as forest giants and often planted in our parks and streets.

About 13-hours’ drive northwest is Carnarvon National Park, a spectacular sandstone gorge, an oasis in the drier country around it. I first visited as a child with my late mum in 1967.



Above: The visually stunning Prussian blue and cream Lamington crayfish, *Euastacus sulcatus*, lives in streams but sometimes walks about on rainforest tracks. © Queensland Museum, Gary Cranitch

It was much wilder then but we flew over the gorge in a light plane. The gorge boasts great aboriginal rock art, sheer cliffs, ancient plants, and plenty of animal life.

I had subsequent interaction with a beautiful little marsupial from that area in 1988. Friends were running field classes for visiting US students and doing trap-and-release surveys for mammals. A rufous bettong, *Aepyprymnus rufescens*, dropped its young when released and my friends reared it to save its life. Having lived in Papua New Guinea, they named her Lik-Lik, “Little One” in pidgin English.

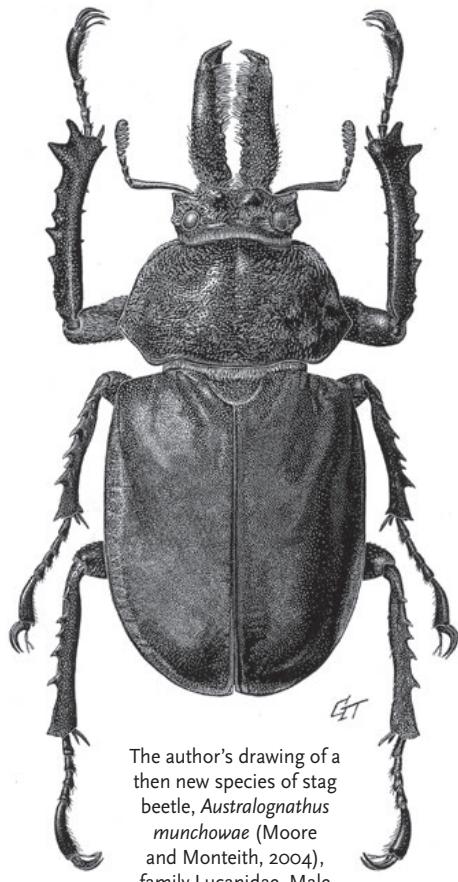
I was allowed to borrow Lik-Lik for a few days to paint her. She wouldn’t foul her own nest. So she slept on my bed. She would wake me to be lifted down and bounce through the house to snack on sweet potato. I painted her asleep in a blue blanket. The painting sold to her owners at a Queensland wildlife artists’ exhibition. As she grew, she had the potential to become more aggressive towards her carers but sadly couldn’t be released into the wild. So she lived out her days with others of her species at Currumbin Wildlife Sanctuary on the Gold Coast.¹¹

Queensland Museum also collected in the Mount Moffatt section of the park, once with the Queensland Naturalists’ Club. Another species of large stag beetle in the same genus as the one in north Queensland was collected in a flight intercept trap in the high country there. It was already known from Blackdown Tablelands but had not yet been described. The late Barry Moore and Geoff Monteith described it as a new species, *Australognathus munchowae*, in 2004 and I had the privilege of drawing it for its description.

CONCLUSION

Biologically, Queensland is an incredibly rich place to live. I have only scratched its surface in my lifetime. I have yet to see the deserts with their famous red sand hills and totally different plants and animals. Someday too I hope to see the flocks of wild budgies out west as well as the vast wilderness of Cape York and the islands of the Torres Strait.

This had to be a personal account and of course there is plenty I have seen that I couldn’t even mention. I hope this whets your



The author’s drawing of a then new species of stag beetle, *Australognathus munchowae* (Moore and Monteith, 2004), family Lucanidae. Male dorsal habitus. Ink on scratchboard. © QM, Geoff Thompson

EDITOR’S NOTE: Due to space limitations, many images for this article have been moved online. Visit the GNSI website and look for this Journal article’s linked PDF file with the complete set of photos and illustrations.

appetite to visit our country and particularly our state.

Acknowledgements

I wish to express my sincere gratitude to Geoff Monteith. Firstly for taking me to all those amazing places and teaching me so much about the natural history of the plants and animals we saw. Secondly for kindly reviewing, correcting, and commenting on this manuscript. Thanks are also due to the Queensland Museum, particularly to staff members: Andrew Rozefelds for helpful comments, Michelle Ryan for image use approval, and to Peter Waddington for accessing them.

— Geoff Thompson

Right: Lik-Lik, a juvenile rufous bettong, *Aepyprymnus rufescens*. Watercolor. © 1988 Geoff Thompson



References

¹ Worboys, S. "Australia's Native Rhododendrons Hide in the High Mountain Forests." *Beating Around the Bush*. The Conversation, 2018. Web: theconversation.com

² Zich, F.A., Ford, A.J. "*Tecomnanthe burungu* (Bigoniaceae), a New Species from Northern Queensland." *Australian Systematic Botany* 31, 481–486. CSIRO Publishing, 2018.

³ Wikipedia contributors. "Gymnostoma." *Wikipedia, The Free Encyclopedia*, 3 Mar. 2018. Web: en.wikipedia.org

⁴ Worboys, S. "It's Hard to Spread the Idiot Fruit." *Beating Around the Bush*. The Conversation, 2018. Web: theconversation.com

⁵ Queensland Department of Environment and Science. Mount Lewis National Park: Nature, Culture, and History. *Parks and Forests*. Queensland Government, 2017. Web: parks.des.qld.gov.au

⁶ Queensland Museum. "Coastal Taipan." *Find Out About*. Queensland Government, 2019. Web: qm.qld.gov.au

⁷ Burrell, S. "Dingo." *Discover and Learn*. Australian Museum, 2019. Web: australianmuseum.net.au

⁸ Smee, B. "Fraser Island Dingo Attack: Boy in Hospital After Running Into Pack of Wild Dogs." *The Guardian*. Guardian News and Media Ltd., 2019.

⁹ Davis, S. "Kathleen McArthur, the Wildflower Woman Who Took On Sir Joh." *The Sydney Morning Herald*. Fairfax Network, January 2019.

¹⁰ Queensland Department of Environment and Science. "Birds of Lamington National Park." *Wetland Info*. Queensland Government, 2019. Web: wetlandinfo.des.qld.gov.au

¹¹ Crew, B. "The Mini-Kangaroo with the T. Rex Arms." *Australian Geographic*. Australian Geographic Society, July 2018.



Welcome to Australia!

The GNSI and your host, Geoff Thompson, are very excited to welcome everyone to Brisbane, Australia for our 51st annual conference. The entire committee is hard at work to provide you with art, inspiration, camaraderie, and lots of fun Down Under!

A GNSI conference is always a top-notch experience, but this should be something special. For many, if not most, this will be a first-time visit to Australia, and will require a long trip. We aim to make that travel time more than worthwhile, so make your plans, pack your bags, and get ready for an amazing Australian experience!

EXHIBIT



Queensland Museum foyer

CALL FOR ENTRIES!

GNSI and AIMBI Members’ Exhibit

Rendering Science: Clarity and Concepts

Submissions are now being accepted for the 2019 GNSI and AIMBI Members’ Exhibit. The deadline is Tuesday, April 30th (USA) or Wednesday, May 1st (AU).

Accepted entries will be projected in the Queensland Museum foyer, July 1st–7th, and displayed online on the GNSI website.

Check the 2019 Conference Website for details about how to submit your artwork:

2019gnsi-conf.org/exhibits/call-entries

BRISBANE 2019 CONFERENCE WEBSITE: 2019gnsi-conf.org
PULL-OUT SECTION—SAVE - SHARE - POST!

CORE PROGRAM



PHOTOGRAPHY SYMPOSIUM

Sunday, June 30

Renowned photographer and digital color expert Les Walkling will speak about color spaces and calibration of color workflow, through to the finished print. He will also offer insight into 3DLUT Creator as an extension of Photoshop that allows incredible adjustments

without the need for complicated Photoshop Layer Masks.

www.leswalkling.com/history

Museum photographer Gary Cranitch will talk about his award-winning underwater photography on the Great Barrier Reef and on dry land. In 2008, Gary was the Australian Institute of Professional Photography's Science and Nature Photographer of the Year.

www.abc.net.au/news/2017-05-12

Photo-artist Man Cheung will talk about his and his brother Wah's *Digital Garden* project. Man and Wah were artists in residence at *The Cube* in 2018 where they created *Digital Garden*—a large scale audio/visual project that utilized the entire *Cube* space in creating an immersive experience.

www.thecube.qut.edu.au/cube-screens/2018

These talks should interest anyone with a penchant for accurate color reproduction, plants, or the Barrier Reef.

SPEAKERS

Renowned artist Maria

Fernanda Cardoso will speak about her doctoral research on art and science, emphasizing the value of making models in science. She and Geoff Thompson will also talk about their joint project to photograph tiny Australian peacock spiders and use them as the basis of artworks, some of which were recently purchased jointly by London's Tate Gallery and Sydney's Museum of Contemporary Art.

www.tate.org.uk/press/press-releases



Author and naturalist Tim Low will speak about his well-known book *Where Song Began: Australia's Birds and How They Changed the World*. "Renowned for its unusual mammals, Australia is a land of birds that are just as unusual, just as striking, a result of the continent's tens of millions of years of isolation..."

www.penguin.com.au/books

Entomologist, great insect collector, and science historian Geoff Monteith will speak about The Butterfly Man of Kuranda—Frederick Parkhurst Dodd—and the formation of his famous collection, now a century old.

www.artsandculture.google.com/exhibit



© Queensland Museum, Geoff Thompson



Curator and historian, Judith McKay will speak about Ellis Rowan (1848–1922), Australia's most celebrated flower painter of her day. Born in Melbourne, Victoria, Rowan began exhibiting her flower paint-

ings in about 1873. After meeting the

world-traveling English artist Marianne North in 1880, she took up a life of travel and adventure, stressing the importance of painting her subjects in their natural setting. In 1912, upon exhibiting her work in Brisbane, Rowan successfully challenged the state government to buy 125 paintings which are now in the collection of the Queensland Museum.



© Queensland Museum, Peter Waddington

PRESENTATIONS

Insects in Art During an Age of Environmental Turmoil by Dr. Tierney Brosius, *Augustana College*

Personal Duets: The Dance of Symbiotic Relationships—A Watercolor Journey by Vicky Earle

A 300-Year Global Journey of Two Insects and a Cactus by Joel Floyd

Sketching Animals: How to get a 3D Animal onto 2D Paper by Gail Guth, *Guth Illustration & Design*

Collaboration, Education, and Gaming: If We Build It, Will They Come? by Deb Haines, *University of Tennessee*

Experimenting with Visual Tweaks by Dr. Jennifer Landin, *North Carolina State University*

The Real Indiana Jones by Professor Scott Rawlins, *Arcadia University*

Procreate(R)ing with the iPad by Ivan Gromicho

FIELD TRIPS

NOTE: Field trips may change, check the conference website for the latest information.

LONE PINE KOALA SANCTUARY

Meet some of Australia's wonderful wildlife. Cuddle with a koala, feed the kangaroos, or observe the animals housed at the sanctuary. There will be plenty of free time to sketch, photograph, and visit the many animal exhibits.

WILD DOLPHIN CRUISES: BOAT TRIP TO MORETON ISLAND AND MARINE WILDLIFE TOUR



Feed the fish, swim with tropical fish over the ship wrecks, see dolphins, turtles, wobbegong sharks, dugong, and maybe a whale or two! Smorgasbord lunch and morning/afternoon tea provided.

NORTH STRADBROKE ISLAND WITH ABORIGINAL GUIDE

Visit an early European pioneer cemetery. See whistling kites, koalas (possibly), and a flying fox colony. Stop at the Salt Water Murris Art Gallery, a fishing village, and Cabarita Park, and ground orchids that grow under Casuarina trees. Stroll along the 1.5 km North Gorge Boardwalk with breathtaking ocean views, native eucalypt forest, and wildlife. Main Beach and Cylinder Beach are good spots to watch for dolphins, turtles, manta rays, and whales.

QUEENSLAND HERBARIUM

Behind-the-scenes tour of the collection of more than 850,000 plant specimens, representing both native and naturalized plant species and 150 years of species discovery.

AFTER-DINNER CRUISE ON THE BRISBANE RIVER

River cruise with a view the city of Brisbane at night. Two-hour private river cruise with grazing platters throughout.

Declutter Your Photoshop File to Maximize Layer Capabilities for Flexible Scientific Illustrations by Ikumi Kayama

Introduction to Australian Reptiles by Steve Wilson, *herpetologist, photographer, and author*

O'REILLY'S RAINFOREST AND WILDLIFE TOUR IN LAMINGTON NATIONAL PARK

Explore the natural beauty of Lamington National Park. You can feed the birds, walk through the rainforest, walk in the tree tops on the air walk, and hopefully see lots of wildlife. There is an optional private guided tour and a Bird of Prey show; both are highly recommended.



QUEENSLAND MUSEUM AND STATE LIBRARY

Behind-the-scenes tour of Queensland Museum, including a visit to their fabulous library, housing illustrated books dating back to 1554.

BATZILLA THE BAT (Two trips, Friday and Saturday)

Get up-close-and-personal with our fabulous Australian flying foxes. No touching or entry to the huge aviary, but you will be able to sketch and photograph

three different species of flying foxes that are only meters away! A great opportunity to see up to 40 flying foxes getting ready to wake up. This trip will be scheduled at dinner time, so these amazing nocturnal forest animals will be very active.

AUSTRALIA ZOO

The home of the Crocodile Hunter, the late Steve Irwin. Come to sketch or photograph beautiful wildlife from around the world. Over 100 acres with 1,200 exotic and native animals in beautiful natural settings—a worthwhile experience. Optional extras: animal encounters, wildlife shows, and tours.

FRYER LIBRARY RARE BOOK COLLECTION



Some of My Bush Friends in Tasmania, by Louisa Anne Meredith (published in 1860). Native flowers, berries and insects drawn from life, illustrated in verse and briefly described.

NATURAL BRIDGE AND SPRINGBROOK NATIONAL PARK, A WORLD HERITAGE RAINFOREST



This national park is part of the Shield Volcano Group of UNESCO World Heritage-listed Gondwana rainforests. Exquisite rainforest trees and plants are home to an abundance of wildlife, including 600 species of birds, fresh water turtles, blue-and-white spiny crayfish, Pademelon wallabies, goannas, and koalas. Easy rainforest walks with beautiful vistas. Natural Bridge is a rock arch formation with a waterfall into a crystal-clear pool in a lowland section of the park.

WORKSHOPS

Field Sketching with Gretchen Halpert

Painting Birds for Identification with Peter Marsack

Insects in Black and White with Peter Marsack

Plate Lithography and Drypoint Etching for the Home Studio with Beth Croce

Lumpy Bumpy Textured Surfaces? Easy Peasy! with Mali Moir

Sculpting Soft-Bodied Animals with Polymer Clay with Scott Rawlins

Fun and Easy Monoprinting Using a Gelli Plate with Judith Tompson

Masking Fluid Techniques for Watercolor with John Pastoriza-Piñol

Introduction to Digital Art with Julian Teh and Bonnie Koopmans

Advanced mixed media techniques in Adobe CC with Jennifer Fairman

Natural Science Printmaking: Hand Painted Linoleum Block Collaborative Service Project with Carrie Carlson

AUCTION

The annual GNSI Auction is always a conference highlight, full of anticipation, suspense and excitement! The 2019 auction will be no different, although there will be some important things to take into consideration this year. Due to the greater distances traveled by many attendees, we will not be able to transport medium-to-large auction items. Instead, we will focus on small items that fit easily into luggage, AND a whole new suite of nontangible items this year! Start thinking about experiences that you might like to offer, such as:

- Workshop spaces (discounted or free)
- Portfolio review services
- Mentoring opportunities
- Travel opportunities—hosting a travel sketching weekend, offering a place to stay to a traveler, etc.
- Anything else you can dream up!

Auction proceeds are split 50/50 between the GNSI General Operating Fund and the GNSI Education Fund—the Annual Auction is a MAJOR fundraiser, both for maintaining our day-to-day operations and to support chapter activities and outreach. Please stay tuned for more details about how to donate small items and intangible experiences this year.

The Conference Bulletin

(a.k.a. *Travel Tips*) has been mailed to all US and Canadian members. If you did not receive your copy, please call the GNSI office at (301)309-1514 or email gnsihome@his.com.

All others can find the text from this publication under "Travel-Eat-Sleep" and "FAQ" on the conference website and the GNSI Members Facebook page. It contains a wide range of general and useful Australian travel information.

Grow Your Digital Plant

— Heno Hwang

Abstract

In this tutorial article, the author shows how to make a complete plant using the Maya 3D® application, and Photoshop®. The process is designed to maintain maximum flexibility, allowing for the not uncommon case of the customer's request for modifications.

When dealing with several projects at the same time, we may not have the luxury to choose the best way of completing the projects. We may have to find the most efficient way to finalize the projects on time. To deal with clients' feedback and additional imaging requests efficiently, three-dimensional (3D) computer graphics software can be advantageous. The general workflow in such software includes modeling, texturing, lighting, rigging (for animation), rendering, and compositing. The advantage of using 3D computer graphics software for scientific illustrations comes when each of these workflow steps is connected smoothly, making it easy to respond to clients' feedback.

In this article, I describe how I created a quinoa plant illustration using Autodesk Maya®. If you are not used to using Maya, then following this tutorial will be a practical exercise and provide an alternative way for you to create your next plant illustration. Other 3D packages have a similar workflow.

The final version of my quinoa plant illustration is presented in Figure 1. I used Maya® software for modeling, Mental Ray for rendering and Adobe Photoshop® for compositing. However, I will explain how to use an alternate renderer, Arnold, for texturing and rendering to optimize the process on the current Maya version. To begin, I used NURBS/poly modeling. NURBS modeling is similar in concept to Adobe Illustrator's mathematical descriptions of curved lines, but in the 3rd dimension. Polygon modeling converts the NURBS curves into a simpler format of points (vertex) and straight edges, creating triangles and rectangles for export and rendering. For the texturing, I used a reference photo of a quinoa plant leaf.

MODELING

Leaf Modeling

1. Take photos of the plant using your smartphone or digital camera. This process does not require a high-resolution camera, but you need to place the plant's leaf on a flat surface to make a photo for the modeling.
2. Crop the photo to the leaf and place into a square shape. Save the cropped photo (leaf_t.jpg).
3. Import the cropped photo into Maya top-view camera. This will be used as a template for the leaf model.
4. If the image size is too large, scale down the photo.
5. Click the pencil curve tool to draw a curve over the imported image, using your mouse, by following the shape of the leaf.



Figure 1: Quinoa plant render, with the 3D framework in the background.

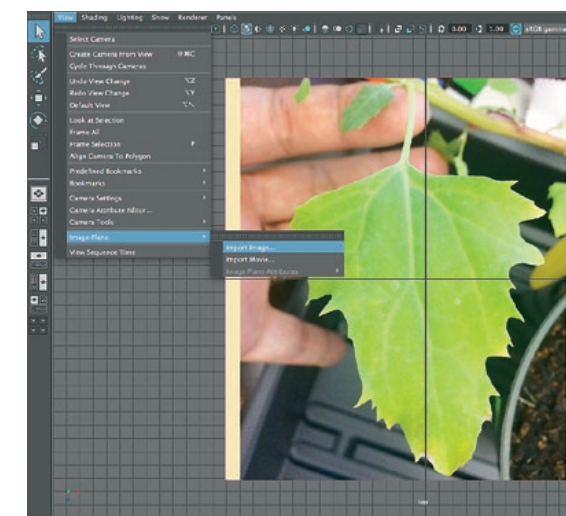
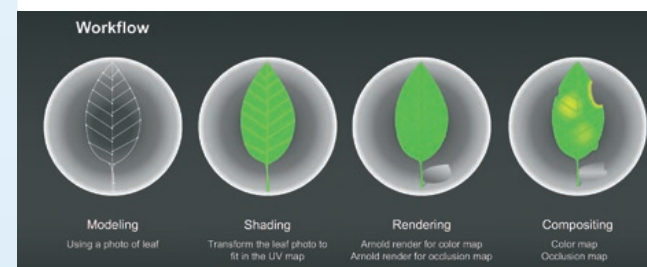
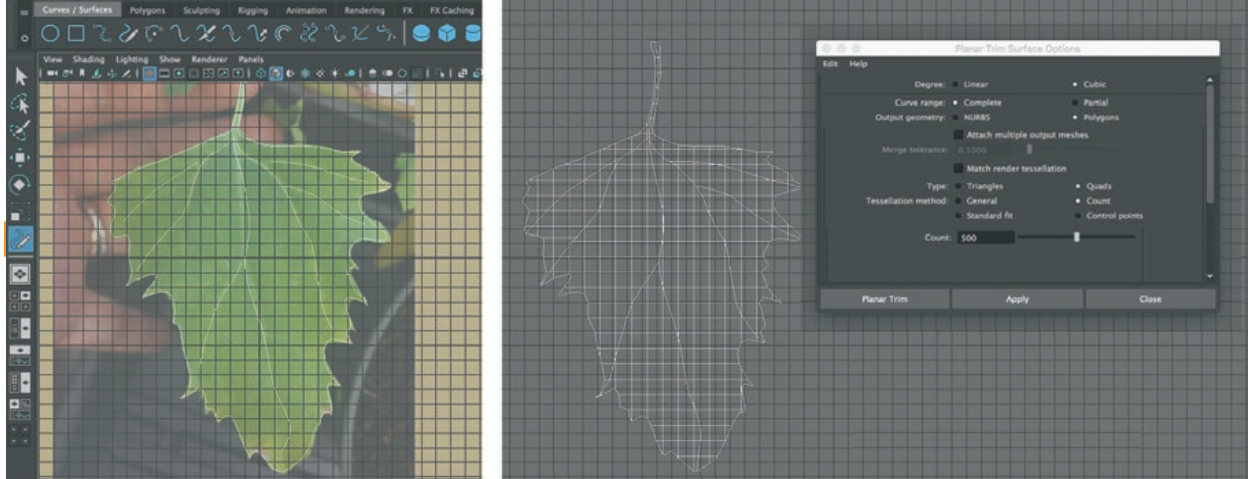


Figure 2: (a) Workflow diagram for the project. (b,c) Original photo is formatted into a square for use as a UV texture and template for 3D objects. (d) Photo is placed in the work area as a template to draw an outline object.

Due to space constraints, to view ALL the step-by-step images of the process, see the online Journal article at www.gnsi.org for a PDF of the full collection.

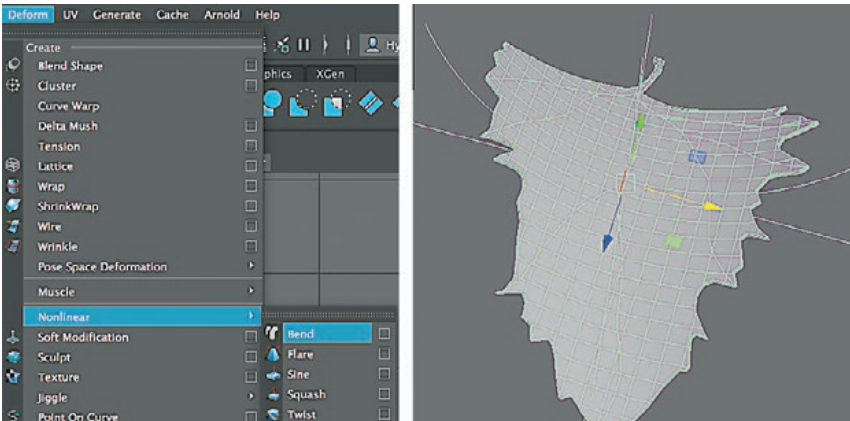
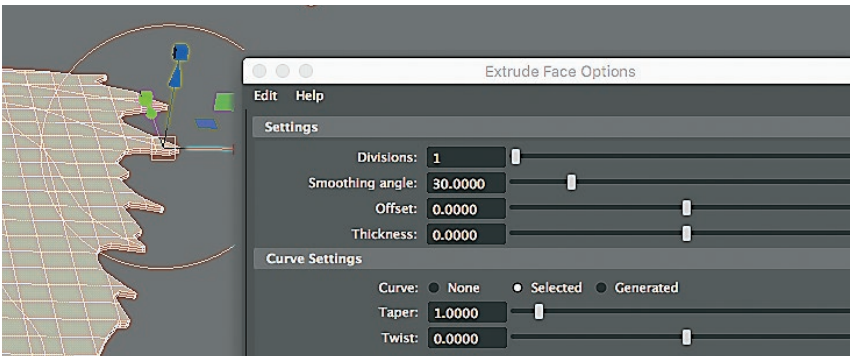
Figure 3: (a) The Pen Curve tool is used to create an outline and veins. (b) Convert the results to a "polygon planar". The conversion settings will join the edges and dice up the surface to make smooth bending of the polygon object possible.



6. Select the first and last control vertex to close the curve and then rearrange each control vertex to minimize the number of control vertices while maintaining the accuracy of the shape.
7. Draw additional curves following the leaf veins. All of the control vertices and curves should be connected through "snapping" to the leaf curve edges.
8. Select all curves and create a "polygon planar" (Fig. 3).
9. Extrude the created planar to give volume to the leaf planar (Fig. 4).
10. Create a UV map using the top-view camera and export a render of the UV map (leaf_UV.png) for later use in creating a plant leaf texture. A UV map designates the position of images and other flat art on the models you are creating.

Figure 4: (below) Extrude the two-dimensional (2D) planar leaf model into the third dimension.

Figure 5: (bottom) Use the "Bend" deformer controls (left) to shape the leaf model (right).



Snapping: the process of aligning points and edges to make the appearance of connected objects. This is a positioning technique, not a true joining of the items. To snap objects, select an object that you want to move and click "w" to activate the move tool. Holding the "c" or "v", then click the middle button of the mouse on the area of the object where you want to relocate. If you hold "c", it will jump to an edge or curve of the object and if you hold "v", it will jump to the control vertex or pivot.

12. Soft select the leaf veins; move them down slightly to give depth on the leaf (Fig. 6).
13. Select the leaf and move the rotation/pivot location to the bottom of the leaf.
14. Duplicate the leaf and scale it down to make stipules and then position the resized leaf to the petiole of the original leaf by snapping.
15. While you do the snapping of the resized leaf objects, you also need to change the direction of the objects. Click the 'e' key and rotate the direction of the objects. After relocating each object, select all of the leaf objects and 'Combine' to make a single object.

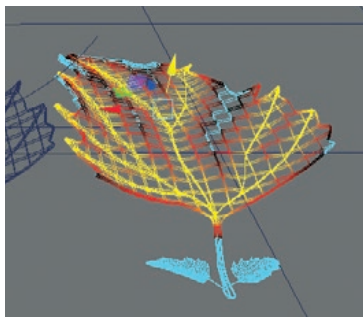


Figure 6: Soft selection allows movement of parts of the leaf to be effected less the further away it is from the selected veins.

We now have the basic leaf unit for duplication on the plant stem. Quinoa leaves have a similar construction at all sizes, so we have to make only one leaf.

Seed Modeling

1. Create a sphere and set the subdivision in width and height to 20 and 24, respectively. Subdivision allows a very simple shape to have a smoother appearance.
2. Select and move the edges, and reduce the scale, to make the shape of a quinoa seed (Fig. 7).

3. Create a UV map while viewing the top of the seed through the camera window.
4. Select the object and change the Y scale; then change the rotation/pivot location to the bottom of the seed.
5. Create a cylinder for a seed bunch stalk.
6. Duplicate the seed object and snap the duplicated seeds on to the cylinder to make a bunch.
7. While you do the snapping of the seed objects on the cylinder, you also need to change the direction of the objects. Click the "e" key and rotate the direction of the objects. After relocating each object, select all of the seed objects and 'Combine' to make a single object.

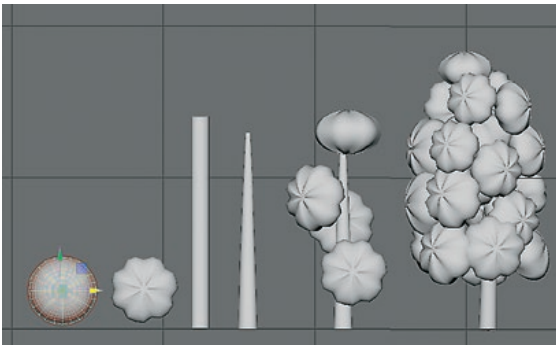


Figure 7: Seeds are modeled from spheres, multiplied and snapped to a stem tip model.

Stem Modeling

1. Create a cylinder for the stem.
2. Soft select the vertex at the top and reduce the scale to create a tapered appearance (Fig. 8).
3. To give a bowed appearance to the upper portion of the stem, use one of the nonlinear deformers, "Bend". To give a twisted shape to the stem, use another of the nonlinear deformers, "Twist".

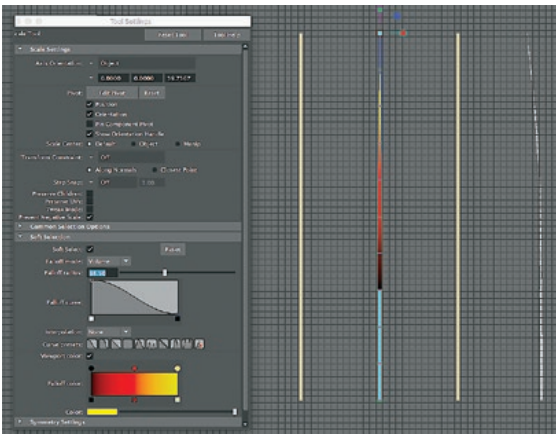


Figure 8: Soft select the end of the stem and reduce the diameter; then apply the Bend and Twist deformer to give the plant an asymmetrical appearance.

Taproot Modeling

1. Select the curve drawing tool and draw a curve following the shape of the taproot through the front camera view.

2. Create a NURBS circle curve and snap the circle to the first control vertex of the taproot curve.
3. Select the taproot and circle curve in order; then open the extrude control box to create a tapered shape.

4. Select the root and change the rotation/pivot location to the top of the Taproot.
5. Duplicate the taproot and scale it down to make smaller branch roots and then attach the resized roots to the proper location of the original root by snapping.
6. While you do the snapping of the resized root objects on the taproot, you also need to change the direction of the objects. Click the "e" and rotate the direction of the objects. After relocating each object, select all of the root objects and "Combine" to make a single object.

Add fibrous roots using the Paint Effect Tool. The Paint Effect Tool is a built-in method for creating many organic textures and shapes, such as plants, hair, fire, feathers, oil paints, pastels, and watercolors.

1. Create a polygon disc for the Paint Effect tool drawing.
2. Locate the disc at the bottom of the stem.
3. Set the disc to be paintable.
4. Click the "Get Brush" and choose a preset brush that is similar in shape to that of the fibrous roots.
5. Change the scale of the brush and draw a line on the disc.
6. Adjust the setting under the "Attribute Editor" to make it look like fibrous roots. A large number of adjustments are possible to create a customized result.
7. Convert a copy of the object from the paint effect to a polygon to make it renderable in the Arnold renderer (Modify > Convert > Paint Effects to Polygons) (Fig. 10).

Assembling

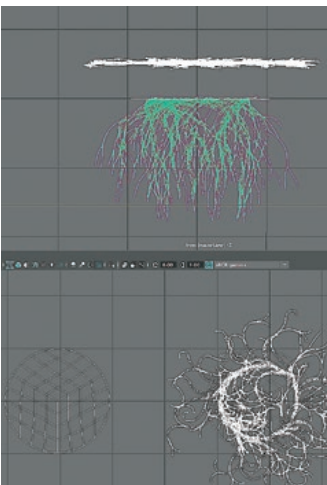
1. Duplicate the combined leaf object and snap them into position on the stem following the real structure of the quinoa plant.
2. Snap the seed head and root objects to the stem.

There are various texturing materials (shaders) in the "Hypershade" window. Choose a material depending on the surface texture desired for the object and the render engine to be used. In addition to using the image of the quinoa leaf for texture color, in this tutorial, I use the AmbientOcclusion shader for texturing. In particular, if the object does not have transparency and transillumination (also known as subsurface scattering), the AmbientOcclusion shader will make the rendering while creating realistic shadow/shading



Figure 9: Create a taproot from a drawn curve and a circle primitive extruded along the curve; then duplicate, resize and reposition root copies to expand the root system.

Figure 10: (a) Use the Paint Effects tools to create a fibrous, root-like objects attached to a disk. (b) Convert the object to a polygon object for rendering in the external Arnold renderer.



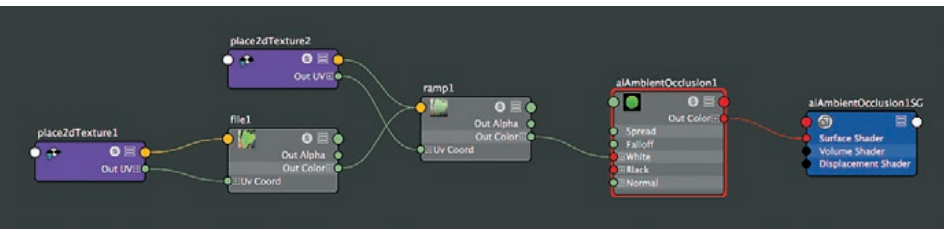


Figure 11: Shader tree: a sample shader showing how the different materials are processed into the final texture that is applied to an object, in this case an AmbientOcclusion type shader for the quinoa leaf.



Figure 12: Ambient occlusion is a shading and rendering technique used to calculate how exposed each point in a scene is to ambient lighting (lighting that comes from all directions). The appearance achieved by ambient occlusion alone is similar to the way an object might appear on an overcast day.

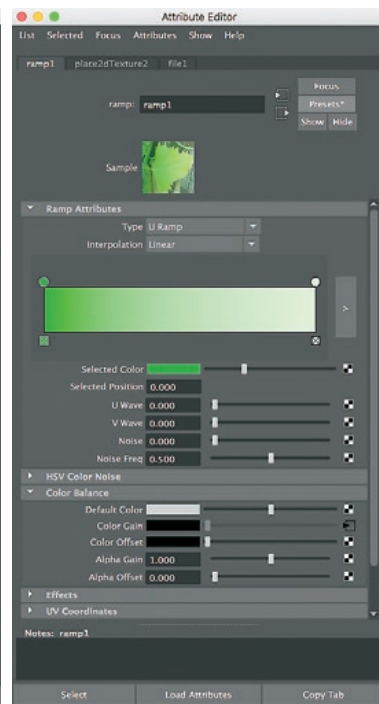
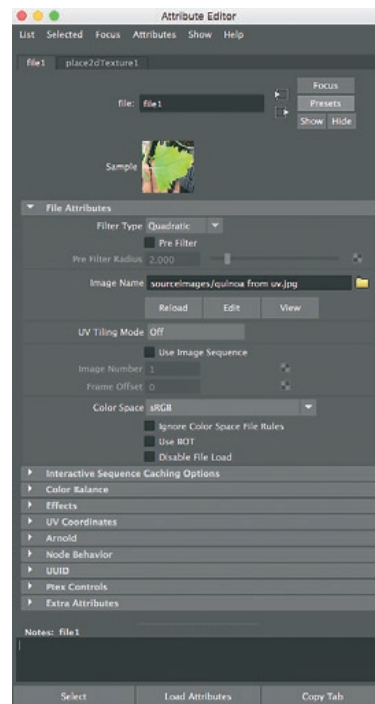


Figure 13: (a) Color texture can be added to shaders by importing images or (b–d) generating graphics with internal tools in the shader's attribute editor.

effects without creating a lighting setup when using the Arnold renderer.

Texturing

1. Switch to Photoshop and create a new document (2,048 × 2,048 pixels, 72 dpi).
2. Open the file leaf UV.png and layer the image from leaf_t.jpg on top.
3. Reduce the opacity of the leaf photo layer so that you can visually resize the photo to fit into the leaf UV area. The resized photo should be a little bigger than the leaf UV.
4. Increase the opacity of the photo layer back to 100% and then save the image as "leaf_Co" after flattening the image.
5. Switch back to Maya and open the Hypershade window.
6. Create an AmbientOcclusion shader for the leaf (with "ramp" for gradation on the leaf and "file" for image color on the leaf). Name it "leaf_A". Select the leaf object and apply "leaf_A".
7. Open the shader's materials attribute and apply the "leaf_Co" image.
8. Create a second AmbientOcclusion shader (with another "ramp" for texturing of the seeds). Name it "seed_A". Select the seed bunch and apply "seed_A".



9. Create a third AmbientOcclusion shader (with another "ramp" and "grid" for texturing of the stem). Name it "stem_A". Select the stem and apply "stem_A".
10. Create a fourth AmbientOcclusion shader and rename it "root_A". Select all of the roots and apply "root_A".

Rendering with Arnold

Maya has a built-in renderer, but other rendering software can be integrated that may have additional features or a better render appearance. One such renderer is called "Arnold". We used it for this project.

1. Open the render setting and set up the image size and quality, for example: 1,080 × 1,920 pixels at 300dpi.
2. Create a camera and aim the focus on the quinoa plant.
3. Change the setup of the camera. Change the focal length from 35 to 200 and rearrange the location of the camera to focus on the object. The longer focal length minimizes image distortions.
4. Open the render setup window and launch the Arnold renderer.
5. After completion of the rendering, export the image and name it "quinoa plant_Co".
6. Create a new render layer and name it "AO"; then create a collection under the subdivision to add all of the objects.
7. Create a shade override and apply a new AmbientOcclusion to the collection. This will be for a shadow-only render.
8. Switch the active render layer to "AO" and complete the rendering.
9. After completion of the rendering, export the image and name it "quinoa plant_Oc".

The purpose of this second render is to have a separate, adjustable ambient occlusion shadow layer for compositing in Photoshop.

Compositing with Photoshop

1. Open the two rendered images "quinoa plant _ Co" (color image) and "quinoa plant _ Oc" (shadow image).
2. Place the "quinoa plant _ Oc" (shadow image) as a new layer in the "quinoa plant _ Co" (color image). Now you can experiment with different blending options.

HOW CAN I MAKE THAT?

When I receive a new illustration project, and while I am doing the brainstorming based on the request, I am already thinking about how I can build up each component structure in Maya. Even if it looks easy to build in the 3D space, I also have to imagine a rough way of texturing with lighting and any additional effects. After creating a simulation in my brain, to move forward, I open Maya and start test modeling and test texturing, focusing on a part of the illustration project. The testing result can be used for the draft version with additional sketches to seek the client's agreement.

Unfortunately, working with Maya can be a time-consuming process. To have a high-quality detailed image, you may need to move vertexes or edges one by one for a long time to get just the right shape. However, I would like to say that although this is the usual process in working with Maya, it will be easier and faster with experience. The important thing in modeling is that the final 3D object should be easily retouchable for later additional modifications. In addition, the texturing should also be set up to ease modifications based on the client's feedback. At the final stage of this project, the client asked me to increase the number of fibrous roots and to modify their direction to be more spread out. This change was easy to deal with through the Attribute editor of the fibrous roots.

The skills used in this tutorial are not special techniques and are close to the basic level of skills needed to begin modeling with Maya. If you are interested in using Maya, I hope that following this tutorial will provide a helpful path for understanding the workflow and some insight into how to use Maya.

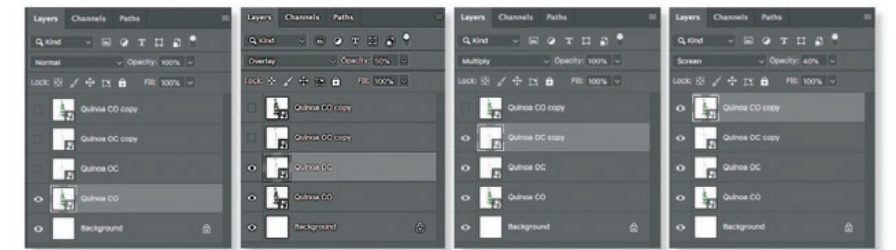
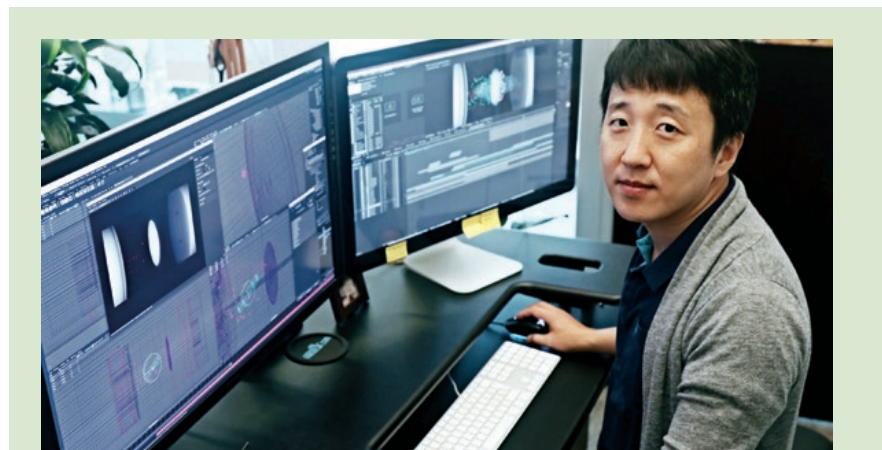


Figure 14: Two renders of the plant are made. One is the "color" version (quinoa plant_Co), the second is just the ambient occlusion shading (quinoa plant_Oc). These are then duplicated in layers inside Photoshop. By turning on different layers and adjusting the layer type and opacity, different "looks" can be quickly created for client approval.

EDITOR'S NOTE: Due to space limitations, most of the step-by-step images for this article have been moved online (over 100 of them). Visit the GNSI website and look for this Journal article's linked PDF file with the complete set of images.



ABOUT THE AUTHOR: Heno Hwang is a Senior Scientific Illustrator at King Abdullah University of Science and Technology in Saudi Arabia. While he was studying microbiology (BA) and molecular medicine (MS), Heno discovered that developing an image for understanding the scientific logic of a project and transferring information was a powerful way to communicate science. Heno studied Maya VFX at the Aniaatus Design Academy, and Medical Art at Dundee University in Scotland. As a biomedical illustrator and animator, Heno creates scientific images and animations for research projects, scientific journals, presentations, and television.

Artwork Gallery Exhibition

This installment of RRRRipped From The List begins as a discussion about insurance protection while exhibiting works in Galleries. It morphed into recommendations for framing options when preparing for a show, and shipping considerations.

—Stephen DiCerbo, RRRRipped Editor

Editor’s Note: *These responses are a continuation of the discussion presented in the last journal issue, JNSI vol. 50 no. 3.*



All art © Stephen DiCerbo

RESPONSES (continued from last issue)

FRAMING CONSIDERATIONS

From: Karen Ackoff

I agree it is best not to exhibit without insurance, unless I can send a print. Still, the time/effort of making a good print, framing it and shipping it... requires an investment of time/effort/dollars. As you say, [it is] sobering. I try to exhibit once or twice a year to keep my work out there and to stay active in the art community. I’m disappointed to learn that the frame-it-yourself shops are few and far between, at least around here. I assume for insurance reasons. I know most places use computerized mat cutting these days. I cut mine by hand using an inexpensive Logan cutter (though I lust for a fancier model). I have grown somewhat dissatisfied with my frame shop of some 15 years... they have raised their prices hugely. A large sheet of 8-ply archival mat board costs \$120; I can get the exact same thing for less than half elsewhere. That’s just being greedy. I haven’t tried them yet, but I’ve scoped out another small frame shop whose owner has agreed to make the (wood) frames and cut the glass... and I can do the rest (to keep the cost down). Life isn’t dull!

From: Marni Fylling

I don’t show my work much, but am getting ready for a little exhibit right now. I use American Frame Company (www.americanframe.com). Their website is awful to order from (for me, anyway), but if you have all of your dimensions, you can get reasonably-priced frames, mats, backing board, plexi, etc. that you assemble yourself. For my little block prints (frames

are about 7” × 8”, the cost of all of the supplies is under \$20 for a black metal frame, normal plexi and regular mat and backing board (not archival). Of course, they have UV plexi and archival boards, but it’s too expensive for me for a show like this. The shipping is a little pricey unless you’re ordering a bunch at a time—not economical for just a couple of frames. They are very nice on the phone, have never made a mistake on all of the custom mats, and are pretty quick—I think this last order of 7 frames got to me in less than a week from when I made the phone call. Definitely not for everyone, but if it could work for you, it’s something to consider. Good luck!

From: Brie Dodson

Two words: Franken Frames (www.frankenframes.com). Three more words: talk to Roger. I have been dealing with this company now for 15 years, and I am one happy camper. This company goes above and beyond. They have come through for me many a time. Feel free to tell Roger that I sent you.

From: Lynette Cook

Ditto. I’ve used Franken Frames too, several times. Since they custom make the frames to size, it’s best to call before the last minute. . . Years ago I was able to set up an account with a company that supplied the framers—and I got the mat, etc., at wholesale. Then I asked around at some framers and found a local one who would cut the mat windows for me very reasonably. I could get the glazing at a separate plastics company. I’d then assemble all the parts. It saved some money. [I’m] Unsure whether such a thing is possible now. The companies out here who supplied to the framers are no longer around.

From: Emily Damstra

I too have used Franken Frames many times, and agree that the customer service is exemplary. On the other hand, quite a few times my order has arrived with incorrect dimensions. Franken Frames has always corrected this readily and without hassle, but that does take extra time so it is best to order well in advance.

From: Sandy Williams

If you’re looking for a reasonable price for a basic frame I’d recommend Sandra Katy’s Custom Cuts, 1(269)635-7488. She’s located between Buchanan and Niles, Michigan, and I think you live not too far from there. She’s a retired postal worker and works out of her home. She did the framing for a show I had at the Buchanan Art Center the summer of 2015.

From: Kathleen Garness

I had two large local shows (25+ pieces each) that ended up running concurrently (of course, right?!) and used the blonde Cheap Joe’s and Dick Blick L-style frames, with Dick Blick pre-cut archival mats (when the sizes worked out). The Dick Blick archival mats are the Nielsen Bainbridge museum mats and back sets, just bundled for Dick Blick. Saved me a LOT. But admittedly they’re not as lovely as a well-done custom frame. When Carol Woodin was in charge of the *Losing Paradise?* exhibit that made the rounds to the NYBG, Smithsonian, and Kew (et al.), several years ago, we sent the work packed but not framed or matted and she did a spectacular job choosing frames and mats for each piece. All the frames were the same throughout the exhibit, but each mat harmonized with the artwork. It really had a lovely aspect to it. What I do like about these frames is that I can swap out artwork fairly quickly. The custom framer that I have been working with for years in Oak Park closed last year. He had one of those computerized machines that did a nice job, though there were sometimes slight overcuts that a skilled hand framer would have avoided, I think.

From: Karen Ackoff

Thanks for the helpful framing resources—I will look into these. Generally I’m not in a hurry to frame, so hopefully I can find a shop that will work with me. I was just recently repacking a piece to ship, and something looked off to me. I usually add 1/4-inch extra on the bottom of the mat... My frame shop put my work in upside-down! And it’s a no-brainer—a silverpoint of figures, and unless they are all hanging from the ceiling, it’s a major oversight. I’m embarrassed I didn’t notice it sooner (hopefully no

one else noticed it either, as it was exhibited several places—hung upside-up but with the extra 1/4-inch on top). Not very happy about it. Oh well. I will check measurements carefully from now on. A little helpful hint... to hide overcuts, place a piece of glassine or tracing paper over the corner with the overcut, and gently burnish. Gently, so you don’t “polish” the mat surface. The overcuts go away! Because the cuts are angled, a slight overcut is necessary, but a computer probably minimizes this.

From: Linda Feltner

If anyone has a business/wholesale license, San Diego Frame (www.sandiegoframeco.com) offers great wholesale prices. They own their own shop, and normally have a two-week turnaround. They are a partner of Society of Animal Artists, and if you are a member of that organization, you get an additional discount off of wholesale. Retail prices on frames are really high for works on paper.

SHIPPING CONCERNS

From: Jennifer Keller

Several of you have referred to shipping your artwork with added insurance. What are your favorite and least-favorite carriers? I nixed FedEx when they insisted that my artwork was only insurable for the cost of the paper it was drawn on. Would love to hear others’ experiences and advice.

From: Linda Feltner

I experienced the same thing with FedEx. They would charge me to insure a \$3,000 original, but the fine print only paid out \$250. Hmmmm. I ship UPS, and they seem to have a different policy. I’ve never had a claim however. Others have a few horror stories, as I remember.

From: Brie Dodson

Actually, FedEx and the USPS have both been good to me. My USPS experiences were many years ago, though, and since then I’ve used FedEx Ground. I pay extra to insure the piece to its full value, and I require a signature. I also photograph carefully exactly how the piece is packed in its Airfloat strongbox, with a piece of foam board cut to the outer dimensions of the front face of the frame in order to protect the painted surface from any incursion, and before that, I take good photographs of the piece both in its frame and out of the frame, front and back, to document the quality of the artwork. I haven’t yet had a problem. So I don’t know how either FedEx or USPS would deal with me if there were to be a problem. I just try

THESE POSTS are from the GNSI’s SciArt-L Listserv, a friendly place where members can e-mail questions and share ideas about science illustration. If you have not yet subscribed to the Listserv, please visit gnsi.org/resources/reviews/sciart-l-listserve for instructions on how to sign up. We would love to hear from you!



to take all the steps I can in order to avoid one. The problems I have had so far have all had to do with damage to frames during the exhibition hanging and repacking process. Don't get me started on those.

From: Karen Ackoff
I use UPS. But all UPS stores are not equal. I moved, so went to the new-to-me UPS store and they refused any insurance whatsoever. No amount of insisting helped. So on a whim I called a different store and they were fine with it. When the work is returned to me, I have it shipped to them. For \$5, they hold it til I can pick it up. [The art] stays safe and dry. Their only complaint is the Uline box I use doesn't meet their specifications for shipping artwork. They want it to be 4 inches deeper. But they still will ship for me. [They have] very nice service. Before Uline boxes I made my own boxes of layered foam core. These would get wrapped in plastic and put in a larger box with shipping peanuts. I still am using a few of these. Once I shipped a piece this way, got to the conference (not GNSI) and they could not find the box, even though it had been signed for. Looked everywhere that night. Next morning looked again and checked by the loading dock. There was the box, stacked next to a dumpster to be thrown out. Covered with the bright green stickers the conference provided. The box was light (foam core box around a small piece), so someone had decided it was empty without bothering to look inside. The conference had insurance so insurance wasn't an issue, but it just shows the unexpected can happen. I filed one claim with UPS. A piece must have been unloaded off the airplane either by throwing it or it fell. On the corner. Glass shattered (I frame pastel drawings in glass). Glass was taped, I believe. Metal frame bent. Artwork (sigh of relief), OK. But the frame was a very fine metal frame that had been custom painted. And there were two

matching frames, though the second one was not damaged. UPS covered the cost of two new frames and glass. It was paid out between two insurance companies—one for UPS and one for the specific shop.

From: Jennifer Keller
So Karen, what words do you use, exactly, with UPS, when you say you want to ship artwork? I have seen UPS employees turn into deer in the headlights at the mere mention of the word "artwork". Like it has never come up before! Sometimes they seem to respond better to the term "scientific diagrams", in my experience... Anyway, would love to know just how you phrase things. Around here, we have only one conveniently-located UPS (although your advice to try out different UPS stores is still well-taken.) I would drive a fair distance further if it meant a better, more secure deal on shipping.

From: Linda Feltner
In my area there is a "UPS Store" and a "UPS Center". The UPS store is a separate business enterprise, [who] partners with UPS. They will NOT ship artwork insured unless THEY pack it and they use peanuts. Peanuts are not allowed in some exhibits. So, I use an Airfloat box, take pictures like you said, and the regular, official UPS delivery center has never argued one whit. They do make note if it's glass, plexi, or in some cases, double-boxed (but that's a home-made box). So the difference may be that a UPS Store really has [their] own rules, different from the "real" UPS. Hope that helps.

From: Gretchen Halpert
I've used FedEx, UPS and USPS. I've experienced damage and temporary loss... but don't remember who I used at the time. I think the damage was with FedEx and the misplacement—which caused half my work to not arrive at the venue in time for the exhibit—was with UPS. I've never had a problem insuring the work with any of them, or with using my own boxes of any size. The less time in transit, the better (fewer hands handling the box), so I pay more for second-day delivery. While UPS couldn't get my art to Massachusetts from New York, they handled my two large cartons from Taiwan to New York safely and quickly. The cartons arrived home before I did. Claims—I had one successful one with FedEx and one pain-in-the-neck unsuccessful one with

UPS. Bottom line: I rate them equally. It depends how, when, and where and how the planets are aligned at that moment.

From: Lynette Cook
A few years ago a space art colleague turned me on to G4Si (www.g4si.com), which normally ships jewelry, diamonds, and such, but also ships art. I set up an account and started using them to ship art. About a year or so ago G4Si was bought by UPS and all my account info transferred over automatically. Now it is under the company name Parcel Pro. You can insure for the full value of the art. This said, you must follow certain guidelines—such as ship in approved boxes (I use the lined strongboxes from Airfloat Systems) and NOT put "art" on the outside to alert the driver as to what is inside. Also recommended: don't send the tracking number to the recipient. You can set up the shipment online, print out the label, and drop off at a UPS store (get a receipt) OR have the driver pick up on the premises (i.e., your house or studio).

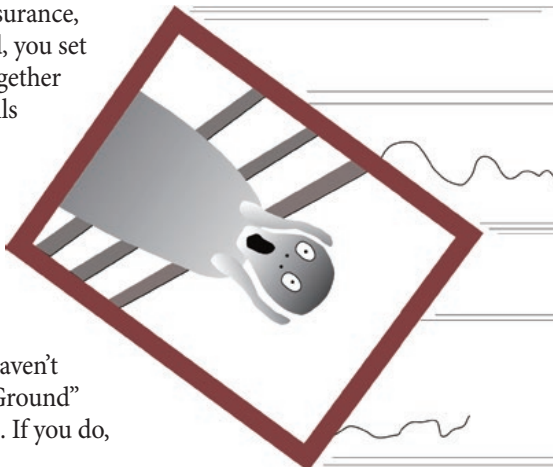
From: Karen Ackoff
That looks really interesting. However I could find no info on rates and insurance cost except they say these costs are combined. So I tried signing up but it seems I have to have an incorporated business with a federal tax ID. It's just me so it seems I cannot qualify—unless I am missing something? This is the signup page: www.parcelpro.com/public/signup.aspx

From: Lynette Cook
Perhaps you'd do better to call and set up your account on the phone with a live person (I assume you can). I don't have a Federal tax ID either. And that's right: costs likely are not posted. When I signed up with G4Si I did so over the phone with a rep. He got me started, gave me the important details, etc. He told me that charges tended to be under what one normally pays for shipping (i.e., for Jane Public) and gave me the insurance rate per unit of value. He also said I could ship personal packages through the company if I wished and save a little \$\$\$. Now that UPS is in charge I find an emphasis on double boxing—which I didn't before—yet the Strongboxes (lined ones anyway as I don't know about the others) are approved by UPS and FedEx. I've never had anyone question my Strongboxes. The lined ones are nearly puncture-proof. I have found the charges to be remarkably low. When you have an account and go online you can get an estimate for the cost of your shipment. These estimates have been very accurate. I should make it clear that you can choose the shipper you want, either UPS or FedEx, and that

the insurance is added to the cost of the shipping. In other words, Parcel Pro isn't a third party shipping company. It provides the insurance, for all intents and purposes. This said, you set up the shipping and the insurance together through Parcel Pro and Parcel Pro bills you for both. I choose UPS to do my shipping, as I find the costs are less than with FedEx. Normally I choose ground as well. With G4Si the rep had to add "Ground" to my list of options since most people in the jewelry and diamond business choose overnight services. I think I haven't had that issue with Parcel Pro (i.e., "Ground" disappearing from my list of choices). If you do, though, ask about it.

From: Karen Ackoff
Thanks... I'll call and see where that gets me. The Uline boxes (lined and puncture proof) I've been using look identical to the Strongboxes, and UPS complained that the box needed to be 4 inches deeper. So we'll see. When I made my own shipping boxes (layered foamcore), I always double-boxed. But not with the Uline boxes. It added to the expense, needless to say. I'll let you know how it works out. (It will be a while, as I'm knee-deep in deadlines at the moment.)

From: Lynette Cook
[This is] interesting about the double boxing. G4Si was fine with the lined boxes when I explained they were for shipping art. I've not had anyone at Parcel Pro complain about my using them. Admittedly, since this was squared away with G4Si and my account transferred over I didn't go into great length on this topic with anyone new at Parcel Pro.



Chapter Happenings

GNSI Carolinas Chapter

— Betsy Donovan

Our GNSI Carolinas Chapter is a very active chapter and our 2018–2019 calendar is typically varied and engaging. We are a diverse group with members who are career artists/scientists and others who began their artistic endeavors after retirement from other occupations.

Our chapter officially includes North Carolina, South Carolina, and Georgia. Currently we have members from the North Carolina cities and towns of Black Mountain, Burlington, Cary, Chapel Hill, Durham, Garner, Hillsborough, Liberty, Manteo, Mebane, Morehead City, Pittsboro, Raleigh, Sanford, Siler City, and Tobaccoville. We also welcome members from any other areas if you are willing to travel and participate with us. Even if you are too far away to participate on a regular basis, you might be able to join us for our weekend Spring Workshop or our weekend Fall Retreat.

BUSINESS MEETINGS AND PROGRAM PRESENTATIONS

We have three or four Members' Meetings each year where we all gather for a business meeting and then participate in a hands-on program presentation. In 2018, our meeting presentations included a talk by Ray Owen about our upcoming exhibit in Southern Pines in 2020, a Pan Pastels presentation by member Marj Hopkins, and a monoprinting presentation by Susan Fecho. Our November 2018 program featured artist Emma Skurnick, who led us through the steps of applying gold leaf for the background of a painting which we had each created in advance. Our February 2019 program had two presenters scheduled: Mike Dunn, natural science educator at NC Botanical Garden, and Brady Beck, wildlife and nature photographer, currently a wildlife biologist with the NC Wildlife Resources Commission.

MEMBERS' ART EXHIBITS

We have many talented members who have had their artwork shown at various venues throughout the year. In addition, our Chapter art exhibit (from February–July of 2018) was entitled *Feather Your Nest*, with members' paintings exhibited at NC Aquarium in Manteo and then at NC Aquarium in Pine Knoll Shores. Our theme for this show was North Carolina wild birds, including resident and migratory birds from the mountains to the sea. We have two local GNSI chapter members who are also artistic staff members at each of these aquariums; and, thanks to their energy and organizational abilities, we have exhibits at both venues on a regular basis.

In 2020, we will have an exhibit at Campbell House Galleries for the Longleaf Pine Festival in Southern Pines, NC. We began preparing for this exhibit in 2018 with the program presentation by Ray Owen. We have also had two field trips with guided tours by staff at Weymouth Woods to acquaint us with the longleaf pine habitat and the plants and animals which will be the subjects of our paintings. The space available to us at Campbell House Galleries is much greater than any other exhibit we have participated in, so all of us have our work cut out for us, and many members will be submitting more than one painting.

There are also tentative plans for an art exhibit at the NC Aquarium in Pine Knoll Shores in early 2020. This exhibit is just in the planning stage, but the current working idea is to demonstrate the process of developing artwork by displaying what we call "process pieces"—field sketches and studies—along with finished art, developed for the Longleaf Pine Festival show.

SKETCHING OUTINGS

We had sketching outings—called Sketch-Outs—at Niche Gardens and Blackwood Farm Park, both in Chapel Hill, and two Sketch-Outs at Weymouth Woods in Southern Pines in preparation for the 2020 exhibit. In October, in lieu of a Sketch-Out, we met at the home of one of our local members and carved pumpkins for the NC Botanical Garden's *Wonder*

For more information about the Carolinas Chapter, contact Betsy Donovan at bdonovan1@nc.rr.com or view our website at facebook.com/GNSICarolinas

Connection Program to benefit UNC Hospital here in Chapel Hill. Our January 2019 Sketch-Out was held at NC Botanical Garden, our home base.

DIGITAL DATABASE

At the suggestion of one of our members, we have this year created a digital database of Members' Artwork. We each provided digital images for the creation of this database which will be helpful when we need to submit samples of artwork for exhibits.

FALL WORKSHOP 2018

Our annual Fall Workshop took place October 5–7, 2018, on Roanoke Island with a presentation by artist Linda Koffenberger titled *Colored Pencil Challenge*. The challenge was to create a colored pencil painting using only the three primary colors. [It works!! And you can always add just a few grayed colors if you like, such as Pomegranate, a Prismacolor grayed violet.] Our venue was NC Coastal Studies Institutes in Wanchese, NC—an inspiring location with stunning salt marsh and water views. On Saturday afternoon of the two-day retreat, we went for a hike at Nags Head Woods in Kill Devil Hills with our two guides, the horticulturist and outreach staff persons at the aquarium. That night we all went out to eat together, and Sunday we completed our colored pencil workshop at noon.

SPRING WORKSHOP 2019

Our two-day Spring Workshop at NC State University was planned for March 16–17, 2019. Our presenter was GNSI artist Karen Ackoff and our topic was watercolor on vellum. NC State University is a great facility for workshops and is our usual spring workshop meeting place, as the arrangements are made by one of our GNSI local chapter members who is also a biology professor there.



Above: Margaret's sketches at NC Botanical Garden.



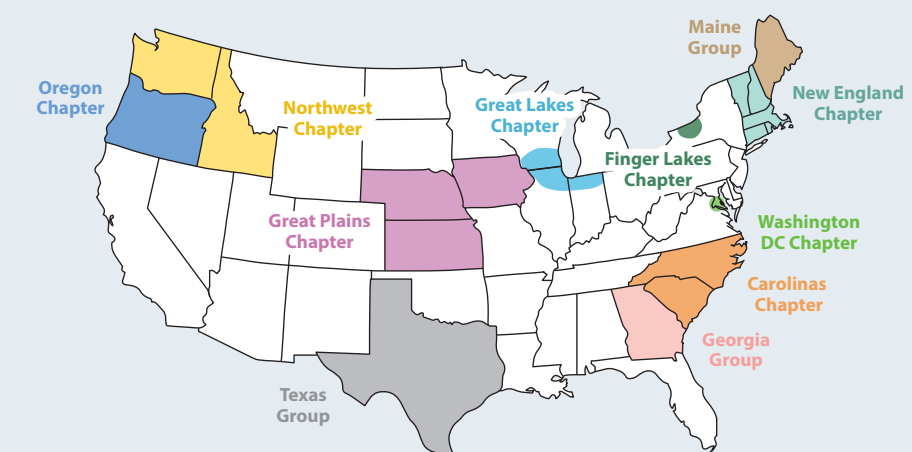
Middle left: Claire's sketch.

Above: Margaret's sketch.



Right: Glenda's pumpkin carving for the NC Botanical Garden's *Wonder Connection Program*.

GNSI CHAPTERS AND GROUPS



This map roughly represents the areas active Chapters and Groups serve in the US (inactive chapters include California, Greater New York, and Illinois Prairie). We also have a Chapter in Portugal. Anyone can join a Chapter! If you live in an area not covered by a nearby Chapter, gather your science illustrator friends together and consider forming your own! Find other members living in your area in the membership directory, or consider posting on social media about potential gatherings. Find our Chapter Guidelines at www.gnsi.org/about.

Above: GNSI Carolinas Chapter members gathered at Weymouth Woods in September 2018.

DID YOU KNOW...

As of March 1st, GNSI has 765 active members in 22 countries.



Submit JNSI

Yes, GNSIers—you too can reap the benefits of having an article of yours in the Journal. Just imagine how gratifying it will be to see your thoughts, techniques, and images well-presented as what you see here! Plus, think what it will do for your resumé.

Have an idea but think you can't write? Contact us and let's talk about it. Our editors are really good at helping people refine their ideas. Just as with drawing, a number of drafts—layers of verbal tracing paper, really—do lead to a quality piece of writing (as several of our authors can attest)! Some articles take a long time to come to fruition, but there's always the next issue... or the next after that.

Your contribution helps our community to further the conversation of all things scientific illustration. We began as a forum for sharing techniques and ideas. Keep that going—share yours via the Journal.

