



Stapelia by Eric Lease.

SPECTACULAR PERU By Scott McMahon

The program starts at 2 p.m. on November 15, but come early to bid on plants and to socialize.

This talk covers an amazing trip to Peru led by Guillermo Rivera, who leads several nature tours a year concentrating on cacti and other succulents. We started in Cajamarca in the north and traveled south, crisscrossing the country on mountain roads and coastal highways ending up in Cusco and nearby Machu Picchu. Some of the others on the trip were Woody and Cathy Minnich, Jan Emming and Wayne Whipple.



Scott in Peru with fog granite canyon plants.

Peru has three distinct vegetation zones. In any given year, the whole length of the coast is dry and gets minimal rainfall for many miles inland. This is caused by the Humboldt Current, a cold current originating in Antarctica, which prevents cloud formation and the rain that could occur. The clouds instead create fog, which some plants have adapted to utilize for moisture. The water that does make it to the coast is from snow melt in the Andes Mountains carried by rivers that flow to the sea.

On the western side of the Andes, many species of plants have adapted to the sparse, but more frequent rainfall and high altitudes that can support grasses, woody plants and more cacti. On the eastern side of the Andes, there is much higher rainfall, and the landscape is covered in plants. The runoff from this area forms the rivers that flow east to add to the massive Amazon Basin.

Speaker Bio: Scott has degrees in Plant Protection from the University of Arizona.

He has more than 40 years of experience in landscaping in the Phoenix area. He has twice served as president of CACSS and is an honorary lifetime member. He is also a second generation native Arizonian! He was a certified arborist at Desert Botanical Garden (DBG) for 15 years, and also managed the cactus collection from 2006 to 2020. He has taught classes on various subjects for the Desert Landscaper

School, as well as other classes at DBG and off-site on cacti, succulents and other subjects pertaining to desert plants.



Because of his knowledge of Spanish, he has participated in three DBG landscape workshops on desert plants in Mexico. Retired in 2020, he has been enjoying working on his own collection of cacti, succulents and desert landscape plants.

Left, Scott on day 12 of his trip from Nazca to Chaluanca.

Below, some of the friends Scott met along the way.



THE PRESIDENT'S PRICKLE By President Stephanie Halcrow

Happy October! Enjoy another amazing *Central Spine* put together by our Editor, Sue Hakala. Something that I'm excited about is the first installment of Cactus Chat which is a monthly interview style article featuring people with sharp minds and uncommon minds. This month, I had a chance to sit down with Tristan Davis for *A Conversation About Conservation*. I think you'll like it, but let me know!

Cactus and succulents develop in the most unconventional forms. This month's newsletter highlights several of these to includes *Moniliform Growth* by Elton Roberts, *Proud Bearer of Bizarre Projectiles*, paper spines by Kathleen McCoy, and *How Do I Handle That Difficult Plant* by Michael Gallagher. If these articles pique your interest, you can always find more about unconventional forms in our CACSS library; there you also can find a book on tequila! which our librarian, Sylvia Lee, has chosen for her book review this month.

CACSS has a great lineup of events for November and December. This includes the Annual MEGA Silent and Live Auction on Sunday, November 1, 2026. The CACSS Fall Hike to Boyce Thompson Arboretum and Wallace Gardens is on Saturday, November 14, 2026, and don't miss the presentation at our monthly meeting on Sunday, November 15 from a past President, Scott McMahon on *Soft and Spiky—Adventures in Peru*. Our year closes out with our Holiday Party on Sunday, December 6. Details on each of these opportunities can be found on our the website or in your emails.

In closing, I wanted to let you know that our Board is actively finishing up the annual budget process, which includes collecting input from all of the committees and teams. This ensures that we are allocating our resources to meet our mission to inspire knowledge and appreciation of cacti and succulents through education, programs and conservation. While resources are important, it also takes you. If you are interested in being a part of one of these efforts, please reach out to me at stephanie.halcrow@centralarizonacactus.org.

Stay Prickly!

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BOARD OF DIRECTORS RECRUITMENT By Elaine Hu

The Nomination and Elections Committee is currently recruiting candidates for the upcoming board of directors 2027–2028 term.



Elaine Hu

The term for all board members is two years, while officers serve a one-year term. Each incumbent director must be re-elected by our members to continue serving on the board. This year, the Nomination Committee consists of Elaine Hu as chairman, Kathi Metzger and Scott McMahon.

Elaine is a current board member and served as Speaker Coordinator from 2022 to 2024. Kathi is also a current board member and has been a member of the Annual Show and Sale Committee since 2024. Scott is an Honorary Lifetime Member and former CACSS president.

Our club currently has over 600 members. Because we want to continue to build a solid and well-structured club, the committee focused on several key priorities during the recruitment process.

First is diversity, inclusivity and varied skill sets. Focusing on individuals with different professional backgrounds and creative outlets brings fresh perspectives to the club. Combined with mutual respect, this diversity is how the club can foster truly strong teamwork.

The second key point is passion. We look for individuals who have a deep passion for succulents and cacti. This enthusiasm will help us expand our conservation and educational outreach, which is deeply rooted in CACSS principles.

Third is time commitment. Candidates must be able to commit to a minimum of 10 hours per month. This includes attending board meetings, contributing to agendas, and actively engaging in club events such as monthly meetings, PEG, the Mega Auction, and the Annual Show and Sale.

Lastly is digital integration. As our club expands, we have fully integrated Google Workspace. Every board member now has a dedicated CACSS email account separate from their personal email. This platform has made teamwork and collaboration between board members and committee leaders completely seamless and professional.

The committee will wrap up the recruitment process by the end of October. Nominee biographies and electronic voting information will be published in the November newsletter. Once again, Brian Simmons will coordinate the election voting software to ensure our electronic election is accurate and secure. Once the results are finalized, the official announcement will take place at our Holiday party on Sunday, December 6. If you would like to become a candidate for a board position and help us build an even

more vibrant community, please contact Elaine Hu at elaine.hu@centralarizonacactus.org.

DATES TO REMEMBER

- November 1, Mega Silent and Live Auction in Dorrance Hall, drop off plants between noon-2 p.m., live and silent auction 2-4 p.m.
- November 14, 8:30-10:30 a.m., Fall walk in Boyce Thompson Arboretum, more details to follow
- November 15, 2 p.m., Scott McMahon will be presenting our program
- December 6, noon-2 p.m., Holiday Party at Desert Cross Lutheran Church

A poster for the Metro Phoenix Fall Plant Sales 2026. The background is a light purple/pink gradient with a faint silhouette of a saguaro cactus on the left. The title "METRO PHOENIX FALL PLANT SALES 2026" is at the top in large, bold, dark purple letters. Below the title are four rounded rectangular boxes, each containing a date, time, and event name. The first box is for 10.17-11.1 (8AM-5PM) for the Boyce Thompson Arboretum's Fall Plant Sale, including a member's preview on Oct. 16. The second box is for 10.22-10.23 (10AM - 1PM) for the CNUW Fall Plant Sale. The third box is for 10.22-10.26 (7AM- 6 PM) for the Desert Botanical Garden 50th Anniversary Plant Sale, open to the general public from Oct. 23-26. The fourth box is for 10.24 (8AM-1PM) for the Maricopa County Master Gardener Fall Festival & Plant Sale. At the bottom left is the logo for The Arizona Native Plant Society, and at the bottom right is the website aznps.com/chapters/phoenix.

**METRO PHOENIX
FALL PLANT SALES 2026**

10.17-11.1 8AM-5PM	BOYCE THOMPSON ARBORETUM'S FALL PLANT SALE MEMBER'S PREVIEW, OCT. 16
10.22-10.23 10AM - 1PM	CNUW FALL PLANT SALE
10.22-10.26 7AM- 6 PM	DESERT BOTANICAL GARDEN 50TH ANNIVERSARY PLANT SALE GENERAL PUBLIC, OCT. 23-26.
10.24 8AM-1PM	MARICOPA COUNTY MASTER GARDENER FALL FESTIVAL & PLANT SALE

 aznps.com/chapters/phoenix

CACSS NOVEMBER MEGA SILENT AND LIVE AUCTION By Javier Gurrola

Sunday, November 1, 2026
Desert Botanical Garden, located at 1201 N. Galvin Parkway, Phoenix
Drop off plants 12-2 p.m. | Auction 2-4 p.m.

This event is open to CACSS members and guests. No reservations are needed. Let DBG know at the entrance that you are there to attend a CACSS event. All activities will be held inside Dorrance Hall and outside on the adjoining Kitchell Patio.

You may park behind Dorrance Hall and drop off plants between 12-2 p.m. After dropping off plants, you need to immediately move your vehicle to the main parking lot. You may also temporarily park behind Dorrance Hall to load all the items that you have won.

A greeter will be stationed inside Dorrance Hall and will provide you with a bid number. You will use this number in place of your name when placing bids during the Silent Auction. We request that you bring something to write with.

The Live and Silent Auction bidding will start at 2 p.m. and end when the last item is sold. There will be seating available should you want to sit and rest. During the Silent Auction, please do not linger in front of any plants. After placing your bid, please keep moving so that others may come and look at the plants. Please keep track of everything that you have bid on. I would suggest making a list or taking photos of all that you have bid on.

After the Live Auction ends, bidding on the Silent Auction will end randomly for a group of tables. When the bidding for each group of tables ends, please wait until our volunteers use a highlighter marker to indicate the winner. You may then collect your plants and bid sheets and proceed to the cashier or gather them off to the side until you are ready to pay. The last of the bidding will end no later than 4 p.m. Credit/debit cards will be the preferred method of payment, however, cash will be accepted.

This is one of the biggest fundraisers our society has and is a fun event for all. Please consider donating plants or cactus and succulent related items. We especially need nicer plants and related items for the Live Auction. **We ask that any cuttings brought be no larger than two feet, as guests of the Garden may not be prepared to carry oversize/large items. Please no Chollas or Opuntias!**

Boxes are always needed to help transport plants home. You can also drop off donations at DBG on the day of the event and depart if you do not want to stay for the auction. It would be most helpful if you bring completed bid sheets with your donations.

There will not be a sign-up email asking for volunteers to help at this event. If you wish to help, just show up at any time starting at 12 p.m., and I, or other volunteers, will let you know how you can help. All who assist me in marking the winning bids with a highlighter are asked to bid at the beginning of the Silent Auction. Since you will know when each group of tables will end, it would not be fair to others if you were to continue bidding until the last moment.

Bid sheets for your donations can be found at this link: <https://centralarizonacactus.org/show-and-sale/CACSS-Silent-Auction-Bid-Sheet.pdf>

Email me at javier.gurrola@centralarizonacactus.org with any questions.

2027 ANNUAL SHOW AND SALE UPDATE By Pat Adler Committee Chair

The Annual Show and Sale event runs April 2-4, 2027. Setup, plant entry and judging is set for March 30 through April 1. The Show hours are 8 a.m. to 4 p.m. The Sale runs concurrently, except for Sunday when it ends at 3 p.m.

Exhibitor Rules and Plant Categories are in final review to be posted on our website in early October. Reminder, to be eligible for show entry, plants must be owned for at least six months before the show date, i.e., owned by September 30, 2026. Exhibitors must be 2027 CACSS members, and dues must be paid by February 28, 2027. Active 2027 Tucson Cactus and Succulent Society (TCSS) members are eligible and welcome to enter plants.

The process for entering plants, and the procedure for judging day are in development. We are also developing an online exhibitor entry form. Planning is underway for the trophy table plant display..

Prospective vendors are being contacted. The final list will be announced after contracts are signed in late December or early January.

Budget development, volunteer signups, daily schedules, key leads, and food for volunteers and vendors are in process.

MONILIFORM GROWTH By Elton Roberts

The Cactus and Succulent Society of America has identified Elton as a master grower.

Moniliform: shaped like a string of beads. This is from the book *Glossary of Succulent Plant Terms* by W. Taylor Marshall and R. S. Woods.

Moniliform: a necklace or necklace shape; cylindrical and contracted at intervals. This is from *Glossary of the Botanic Terms used in Describing Flowering Plants*.

As far as I know, I had never heard of the term moniliform used for any plant, so I had to look it up to see what it meant. I found the term under *Tephrocactus* in the NCL where it says that the bodies are “small shrubs with moniliform branching.” As for *Opuntia*, most that I know are moniliform. NCL calls the plants shrubs or trees with segmented stems. I have to wonder what the difference in segmented and moniliform really is. One thing I do wonder about is calling a cactus a shrub. I have never heard that before either.



Photo 1, left, is *Tephrocactus aoracanthus*. Photo 2, right, is *Tephrocactus aoracanthus*.

When traveling in cactus land, I have never heard of a cactus called a shrub. I have only heard of *Opuntias* referred to as jointed or padded cactus. I have never heard someone say, “Oh look, there is a moniliform shrub.”

Shrub: a woody perennial smaller than a tree, and branching from near the base. This is taken from the book, *Glossary of the Botanic Terms Used in Describing Flowering Plants*, by R. L. Heinig.

Now let's take a look at several shrubs, as Hunt would call them, as they are branching from near the base. Photo 1 is *Tephrocactus aoracanthus*. This is what moniliform growth looks like. It is a joint on a joint on a joint all the way to the top.

Photo 2 is another form of *Tephrocactus aoracanthus* in moniliform growth. It is ball on a ball on a ball all the way to the top of each stem.

Photo 3 (below left) is another form of *Tephrocactus aoracanthus* in moniliform growth. I guess we could say a bead on a bead on a bead.



Photo 4 (above right) is *Tephrocactus articulatus* in moniliform growth. Again, it is joint on a joint on a joint all the way up the stems.



Photos 5 (left) and 6 are also *Tephrocactus* in moniliform growth. There are a lot more examples I could show you, but I am sure you now get the meaning of moniliform growth. Now keep in mind that any of those balls, beads or joints can easily break off with a little bump. You can, with very little effort, have a pile of balls or joints. Each one would root and make a new plant of moniliform growth.

Now we come to photos 7 and 8. Hunt could not put *Puna bonnieae* under *Cumulopuntia* because it has white flowers. His description of *Cumulopuntia* says that the plants can have yellow or red flowers, but NEVER WHITE FLOWERS. Such a problem, what to do with *Puna bonnieae*. Oh I know, I will put it under *Tephrocactus*. So we find *Puna bonnieae* under *Tephrocactus* in the NCL. Hunt describes *Tephrocactus*



as moniliform in growth. Look at photo 7, and you will not find bead on bead on bead or ball on ball. When *Puna bonnieae* offsets, it offsets where it wants to. Notice that a lot of the offsets emerge from the side, or even the bottom of a joint. If it were a *Tephrocactus*, why is the plant spread out off to the side making a cushion and not growing up in moniliform growth with ball on ball?



Left, photo 6 and right, photo 7.



Then there is photo 8 (above). Oops, it has white flowers so it cannot be put with *Cumulopuntia*. So it's in with *Tephrocactus*. *Puna bonnieae*'s body is not the color of the real *Tephrocactus*, does not look like a *Tephrocactus*, and it does not grow in moniliform growth like *Tephrocactus*. It is not a *Tephrocactus*!

Photos 9 and 10, show that somehow Hunt had a hard time putting *Maihueniopsis curvispinus* under *Tephrocactus* for it is the wrong color, it does not have paper spines, and it does not have moniliform growth. The best thing to do is to put it under *Cumulopuntia boliviana*. Oops, Hunt did not know that *Maihueniopsis curvispinus* has white flowers as seen in photo 10. He did not know the plants, and so he threw a white flowering plant under a name that never has white flowers.

I have been growing *Maihueniopsis curvispinus* and *Puna bonnieae* for many years, side by side, and they grow very much the same, except for their spines. When I got my *bonnieae* it was named *Puna*, and that is where I keep it. When I got my *Maihueniopsis curvispinus*, that was its name, and I keep it under that name for it sure is not a *Cumulopuntia boliviana*.



Above, photo 9 and right, photo 10.



HOW DO I HANDLE THAT DIFFICULT PLANT? By Michael Gallagher

For the most part, the plants that we grow in pots, primarily cactus and succulents, can be readily handled with bare hands. Sharp spines, or sharp teeth on the edges of stems or leaves are not close enough to the pot edges that they prevent, or discourage us, from handling or moving a pot by hand. However, there are those plants that really do present an issue, either from exaggerated spine length, as with some *Tephrocactus* or plants that have overgrown the pot and now present sharp edges to anyone trying to handle the pot.

To this end, I have some suggested tools that can be helpful in the aforementioned situations. These are primarily tools that are associated with woodworking, something I dabble in to a small degree. I have found that the tools have utility in dealing with those hard to handle plants that we still find fascinating.

The first tool is a clamp that would commonly be used to hold two boards together while being glued or screwed together. These are available in a wide range of sizes and configurations, but the one pictured is a 12 inch ratcheting bar clamp that is available from Harbor Freight for around six dollars. As the second picture also shows, it handles modest sized pots while keeping hands away from potential harm.



Left, bar clamp and right, bar clamp holding a plant.



The second tool is an 11 inch reach, 45 degree offset pair of needle nose pliers. This tool is also around six dollars at Harbor Freight. Again, it keeps hands at a safe distance and is also useful for pulling that pot that is otherwise just out of reach on your bench. This tool is somewhat limited to the thickness of the pot wall it can safely handle but is otherwise very useful.

The third tool is an 11 inch C-clamp locking pliers; the form of the tool more commonly known as a vise grip. The throat opening can be adjusted to allow it to handle a wider range of pots than the one pictured. This tool is around 13 dollars at Harbor Freight.



Above, C-clamp locking pliers, and below, locking pliers holding a *Tunilla* sp.

The tool is pictured holding a *Tunilla* sp., which is the equivalent of the jumping cholla on a miniature scale.

If your fingers get near it, you will be pulling small glochids out for hours. This tool does not really clamp to a pot as much as squeeze the pot between the two arms and is dependent on the weight of the pot to hold it in place while you move it. This also means that its utility is limited by your hand strength and the weight of the container.



While I don't use these day in and day out like I would a pair of tweezers, I still find them useful at times in the garden, even if they started life in my workshop.

CACTUS CHAT: A Conversation About Conservation with Tristan Davis

By Stephanie Halcrow

I recently had the opportunity to sit down with Tristan Davis. You know Tristan as the leader of the Propagation Education Group (PEG), as well as one of our judges at the Annual Show and Sale. Tristan and I chatted about conservation and how that impacts how we responsibly collect cactus and succulents. I think you will enjoy the conversation.

Stephanie: Thanks for sitting down with me to chat about conservation. Conservation is one of the mission areas for the Central Arizona Cactus and Succulent Society, and I think we should talk about it more. So, to kick off the conversation about conservation, let's start with a very broad question: Why is conservation important to people like us who love cactus and succulents?



Tristan: Conservation can mean different things depending on your perspective. However, at a minimum, conservation is important to growers and enthusiasts to ensure that the diversity that exists in nature can be appreciated and ensured for future generations. Without conservation, many of the cacti and succulents we enjoy today will not be around for us to enjoy in cultivation or in the wild in the future. As the only species on the planet that can massively alter the livelihood of plant and animal species, we have a responsibility to ensure their survival.

Additionally, our cacti and succulents are a critical link in the Chain of Life as other species are dependent upon them for survival, such as hummingbirds and insects. Plants have evolved complex interrelationships to ensure their own survival.

Stephanie: When we think about conservation, it's not just an informal set of agreed behaviors. There are actually federal laws and maybe even international laws that govern what can be collected and what can be imported or exported. I remember a guest speaker from Desert Botanical Garden who spoke about these earlier this year, but how do you explain these laws?

Tristan: Laws exist for collecting from wild populations along with the export and import of plants and plant parts (such as seeds) at the International (CITES), Federal (USDA), State, and local (for example, Native Plant Ordinances for Pima County or Scottsdale) levels. For the most part, these laws exist to protect wild populations of plants based on scientific studies and/or projected long-term population trends in addition to controlling the spread of invasive species, pests and diseases.

Stephanie: Wow! That's a lot of rules. For a cactus and succulent enthusiast, they might think that these rules don't apply to someone who really loves cactus and succulents, especially because they will take great care of these specimens. Thoughts?

Tristan: Health of ex situ plants (cultivated plants) is unrelated to the health of in situ (wild) populations. There are numerous examples of common cultivated specimens that are endangered in habitat such as a golden barrel cactus. This is why we should always encourage growing plants that have a cultivated origin and never grow plants suspected of being wild in origin. Taking plants or seeds from wild populations can have drastic negative effects on those populations in the wild. There are very few species that cannot be obtained through cultivated plant origins nowadays.

Additionally, I often hear the justification of collection of seeds being that because they produce thousands—often millions—of seeds in their lifetime, that taking a few hundred or so has no impact overall to the species. Unfortunately, these are anecdotal reasonings not based on any scientific study. The fact is, that depending on the species, it could certainly impact wild populations. Factors like germination rates, patchy distribution, pollinator success, habitat degradation, population genetic structure, and climate change must all be taken into consideration. Recent scientific studies using predictive models have confirmed that even small collections of seeds can have an impact on the long-term success of wild populations. Sources such as ethicalcactus.com are a good source of education about building an ethical cactus and succulent collection.

Stephanie: I couldn't agree with you more. But I really want some cool cactus for my collection, and I'd like to start growing specimens from seed. How can I do that in a responsible manner?

Tristan: There are several reputable seed sellers in the USA and Europe that have an enormous variety of species available that have a cultivated origin; even the Cactus and Succulent Society of America (CSSA), and our own society, have Seed Depots where seed can be easily obtained for hundreds of species. Purchases for almost all species from the USA sellers require no permits (some states do require phytosanitary permits to ensure plants/seeds are pest-free). However, even international seed importation into the USA from reputable foreign seed sellers is an extremely easy process. The USDA import permit application process is entirely online, and permits are granted within minutes. There is simply zero excuse for importing seeds and plants without the proper permits.

Additionally, it is important to remember that import/export permits only guarantee that the import/export process was done legally, but there can still be issues with the underlying plants/seeds having been wild-collected. Thus, it is important to deal with reputable sellers.

Stephanie: That is super helpful. So, here's one final question. When I hear someone talk about collecting seeds or specimens without permits, how should I address this?

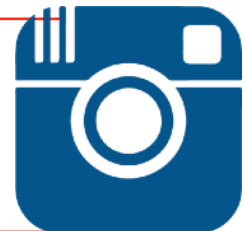
Tristan: It depends on the context of the conversation. I always prefer to approach the situation with education and respectable conversation. To ensure no misunderstandings, ask the person in question what permits were required for their collection efforts or how importation was accomplished. Depending on the response, a conversation can outline the legalities and consequences of illegal collection. Regardless of the situation, if it is clear the collecting was done without required permits, I would always advise that the person actively not support that person/organization until their philosophy is rectified. This is especially true of an organization like CACSS where such activities go against the mission of the society, and such support could jeopardize relationships with the Desert Botanical Garden, as well as the Cactus and Succulent Society of America, of which we are an affiliated organization. As always, education is the key to responsible cultivation.

Another conservation education action takes place in the context of our annual shows, and can be frustrating for some long-time growers. The CACSS policy for accepting plants into the show includes a provision to exclude plants that could have been collected legally prior to the current laws/regulations that would make such a species/plant illegal. Regardless of these plants being grandfathered in as technically “legal,” it is important to not enter them into events like the Show because it sends the message to visitors that those kinds of plants are objects to be desired. That teaches new growers and the public that collecting from the wild is acceptable.

Stephanie: Thanks for joining me today to talk about conservation. I’d love to do more in this area to include a stronger focused partnership with DBG and ensure our actions are in line with CACSS, CSSA, TCSS (Tucson Cactus and Succulent Society), and International Union for Conservation of Nature (IUCN) guidelines. I look forward to future conversations about conservation.



Be sure to visit CACSS on the web at:
centralarizonacactus.org, Facebook, Instagram and
YouTube at: [CentralArizonaCactus](#), and members
only at: [CentralArizonaCactus Swap and Shop](#).



TEPHROCACTUS ARTICULATUS VAR. PAPYRACANTHUS: PROUD BEARER OF BIZARRE PROJECTILES By Kathleen M. McCoy

One day, while repotting native plants of the Sonoran Desert, a strange looking cactus attracted my attention. Tucked near the top window of the Center for Native and Urban Wildlife (CNUW), was a small, maybe 12-inch-tall cactus with strange white protrusions resembling airy dragonfly wings. This outlandish-looking cactus turned out to be a *Tephrocactus articulatus* var. *papyracanthus*, sometimes called *Opuntia papyracantha*. It is commonly known as paper spine cactus, paper cactus or paper spined cholla,. It is not to be confused with a crafted paper cactus. Although both can become shelf decorations. Through the blessing of science, the paper cactus has moved to the family *Tephrocactus* and said farewell to cholla and opuntia.



Tephrocactus articulatus var. *papyracanthus* by Planet Desert.

The cactus in my sight was generally descriptive of all *Tephrocactus*. The spineless, glochid-free green stems look like small pinecone sections .8 -1.6" in diameter clustered on top of each other. Irregular and oblong segments are loosely attached and fall easily to the ground; this makes a very convenient and common approach to self-propagation in cactus land.

More curious are the odd conspicuous projections which make the plant seem bushy. Thin flexible

white slips about 1/8" wide extending from the areoles look very much like flattened pieces of paper that have been scrunched and then not quite successfully straightened. These raffia-like projections are broad relative to the size of the *T. papyracanthus*. They are not spines but thin, durable ribbon-like pieces which vary by plant in color, markings

and length. Hues range from creamy vanilla white to pale caramel brown and even black.

Variations have partly resulted in many names for the species. The move out of past families has also contributed to a glut of names which no longer are descriptive. Formerly an *Opuntia*, the paper cactus is in a class by itself—the *Tephrocactus*. Strips grow every which way, tricking the eye into seeing a larger plant. In spite of their deceptively fragile appearance, strips are hard, flexible and glove worthy.

In late spring through early summer, each segment of the paper spine cactus produces small pale bell-shaped white flowers with yellow cores. The blossoms have a diameter of about 1.6 inches. In their natural habitat, flowers and fleshy fruit may produce seeds but rarely make an appearance in cultivation.

Paper cactus may be a good food source for a variety of pollinators, specifically bees. Information about edible or medicinal properties applicable to humans is awaiting future discovery. Praise, however, floods literature when addressing ease of growth, propagation and architectural interest.

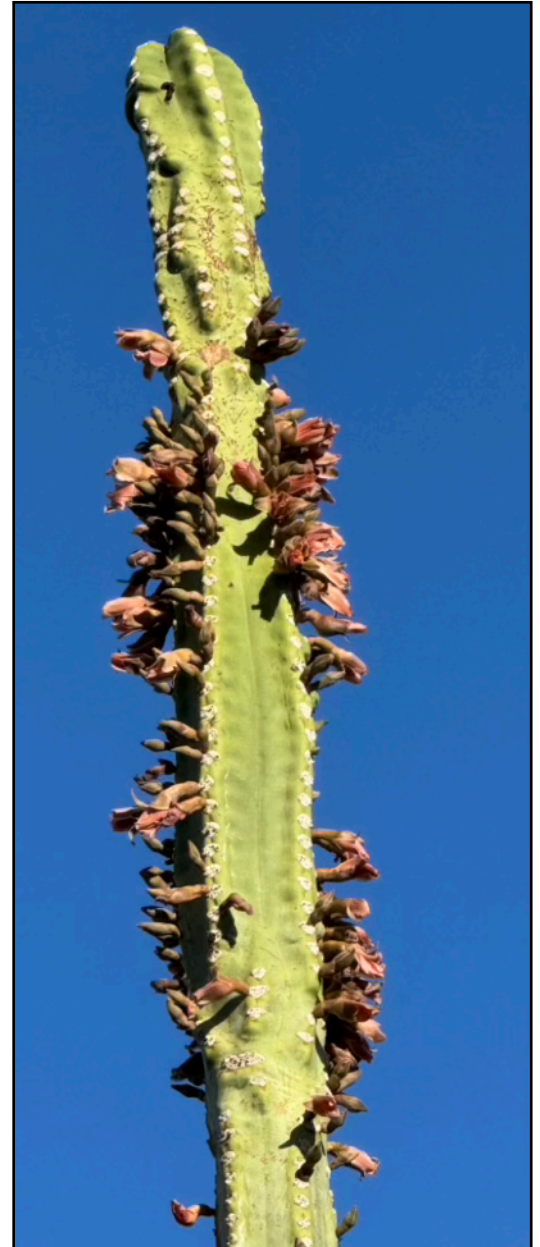
A natural fit for the Sonoran Desert, the paper cactus is accustomed to extreme fluctuations in temperature in its native Argentina. Summer temperatures of 95°F are ideal, but this succulent can live, when provided with shade, adequate water, and dry soil, up to 104°F through brief periods. This drought-resistant resilient plant can survive with a cold temperature down to 23°F, but not for very long. Extended exposure to cold, moist soil can lead to rot. Any drop in temperature below 32°F signals a need for protection, such as covering with frost cloth or bringing it inside.

In cultivation, low maintenance is an understatement. Best fit for the paper cactus indoors is a sunny spot like a windowsill or a shelf in direct sunlight. The location needs to provide bright light eight or more hours per day. The paper cactus is receptive to light sources either from the sun or grow lights. An occasional pot rotation will guide the plant to grow evenly. Soak and dry approaches are best for the plant to grow healthy segmented stems sufficient for water storage. Like its brethren, the paper cactus needs to rest in completely dry soil before the next watering.

Paper cactus thrives indoors. Visual interest, coupled with low upkeep, makes the slow growing and hearty *T. articulatus* var. *papyracanthus* an ideal houseplant. Toss in a well-draining soil mixture to spread its roots, and repot every few years if needed, and this intriguing succulent is headed for a long and healthy existence. *T. articulatus* var. *papyracanthus* is an exemplary houseguest.

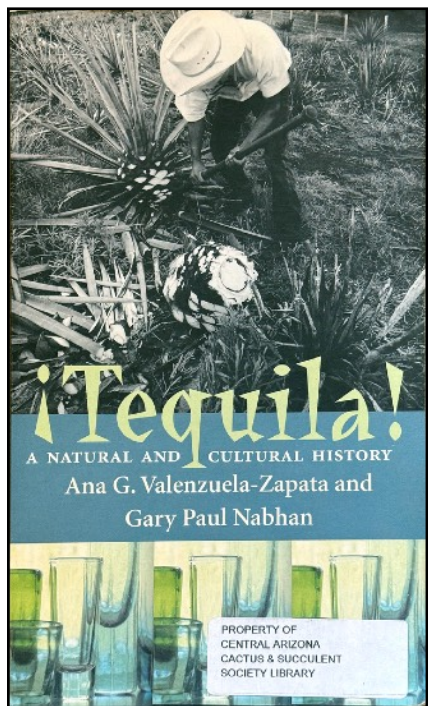
LOPHOCEREUS SCHOTTII VAR. *MONSTROSUS* By Sue Hakala

The plant was four inches tall when I planted it in 1984. Look closely at the left arm. As the plant grew, it stopped getting the funky monstrose growth. The growth then smoothed out, and now puts out small reddish flowers on several arms after a rain. It's against a six-foot-tall west fence. I do water it deeply once a month in the warm months.



On page XI of the Preface, Ms. Valenzuela-Zapata links herself with us (CACSS) when she mentions Dr. Howard Scott Gentry.

In 1950, Dr. Howard Scott Gentry was working as a botanist in Beltsville, Maryland for the Crops Research Division of the United States Department of Agriculture (USDA). He contacted the Boyce Thompson Arboretum (BTA) about the possibility of their collecting plants and parts of plants for the USDA. (Don't worry, I will get to DBG.) Bill



Benson sent an affirmative letter. Gentry visited the arboretum more than once to discuss projects with Bill Benson, who was the BTA assistant director and with Fred Gibson (BTA director, who gave a talk at DBG's opening ceremony several years earlier; but this is not the DBG connection I referred to earlier in this paragraph). Benson was a bachelor at the time, so Gentry bunked with him at BTA when he came to Arizona. Gentry, Gibson and Benson had many interesting chats. Benson later commented, "We spent many pleasant hours learning from him."

At first, Gentry requested cuttings and seeds of *Jojoba*, and Benson did the collecting. Soon, he requested various species of *Agave*. After the USDA determined that *Agave toumeyana* contained a type of cortisone that could be used to treat certain human conditions, Gentry gave Benson's name to pharmaceutical companies. Early in 1950, Benson began collecting *Agave* both for the USDA and for some drug companies. Nothing came of that research because a

cheaper cortisone, made from soy beans, soon came on the market. But this was how Gentry became acquainted with Arizona and with the *Agave*.

Gentry was the first person to seriously study *Agave*. When Gentry left government service, he moved to Phoenix and worked at Desert Botanical Garden (DBG) in order to continue his research. DBG botanists continue to study the *Agave* family.

We, CACSS members, are very involved with DBG, and thus Ms. Valenzuela-Zapata links herself with us.

Ms. Valenzuela-Zapata was a budding botanist in her home country of Mexico when she obtained a copy of Gentry's book about *Agaves* very soon after it was first published. Google AI states, "The book *Tequila! A Natural and Cultural History* was written directly

in English as a collaboration between Ana G. Valenzuela-Zapata and American ethnobotanist Gary Paul Nabhan.” One wonders which author was bi-lingual, or maybe they both were. But I am digressing.

Agave tequilana is called a “blue agave.” Look closely the next time you are among various *Agave* species to see if you can see a blue-colored *Agave*.

In his Introduction, Gary Paul Nabhan writes, “There are only about thirty companies legitimately distilling tequila in Mexico, but somehow their products are variously packaged into more than four hundred brands of tequila sold in the United States. Figure that out!” In another paragraph, he states that tequila “is the hottest of all firewater.” (I think I will stay away from tequila.) Furthermore, his Introduction left me wondering what “mescal” is. Google AI wrote: “Mezcal is made from the heart, or piña, of more than 30 different species of the *Agave* plant (also known as maguey) native to Mexico.” That added nicely to my confusion. Then I began wondering which plant or plants does pulque come from.

The authors very briefly mention the sometimes good, sometimes bad affiliation between diabetes and *Agave* fluids. If you are concerned about diabetes, you will want to watch for the piece of a paragraph in which diabetes is discussed.

Perhaps I did not read closely enough, but I was left wondering if blue *Agave* is one species or several. So I went to Google AI and learned that: “Mexican laws and regulations state that true tequila must come exclusively from the Blue Weber *Agave* plant.” In other words, “blue *Agave*” is a specific species and variety, *Agave tequilana* var. *azule* (or var. *Weber*).

Google also gave these clarifications: “Even “mixto” tequila, which blends *Agave* sugars with other non-*Agave* sugars, must still use a minimum of 51% sugars derived specifically from Blue Weber *Agave*.” While other *Agave* spirits like mezcal can use over 30 different varieties of *Agave*, tequila is legally restricted to this single variety (of *Agave*.)” And that “historical and botanical records identify several other traditional varieties or cultivars of *Agave tequilana* besides azul (Blue Weber), though most are rare or no longer used for commercial tequila.”

I will leave it to you, the reader, to read this small, charming book and see what the author learned about tequila, including much historical and prehistorical information. These are details of how *Agave* is grown, harvested and made into fermentable beverages, all told in a delightful style.

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Direct any comments, questions, ideas to Editor Sue Hakala.



Lithops bromfieldii by
Julie Plath.

SPECIALISTS TO CONTACT WITH QUESTIONS

- **Tristan Davis** Manages the Seed Depot. Specializations include plant propagation and heading PEG (Propagation Education Group).
- **Doug Dawson** Specializations include growing from seed, flora of Namibia, lithops, other mesembs, melocactus, and miniature cacti and succulents of Arizona.
- **Tom Gatz** Specializations include adenium, agave and growing succulent trees as bonsai (bursera, portulacaria, ficus, operculicarya, pachycormus, etc.).
- **Dean Patrick** Specializations in softwood stem-cuttings, plant division and seed starting, rooting cacti, agave, and aloe.