



International Waterlily and Water Gardening Society

WATER GARDEN JOURNAL



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Mt. Cuba Center is on the 2017 Symposium itinerary.



A post-symposium adventure in the Mexican state of Yucatán. “Mission Accomplished,” says Demi Fortuna.

IN THIS ISSUE

03 President’s Letter

President Susan Davis reviews recent board actions.

05 Home Gardening Corner

Six great ground cover plant choices for the pathways around your pond.

06 Event Report

A preview of the 2017 IWGS annual Symposium in Pennsylvania, USA

09 Events Calendar

Upcoming water gardening events.

10 Book Review

Subir Ghosh reports on the book, “Illustrated Aquatic and Wetland Plants in Harmony with Mankind.”

13 Post-Symposium Report

Demi Fortuna shares a tale of great adventure in pursuit of the American Yellow Lotus in Mexico.

18 Expert Corner

Mike Gannon discusses how keeping Koi and goldfish can help children with Autism.

19 News Brief

Evidence of water plants in the diet of early humans.

On the Cover

A couple enjoy the view of the world-famous Tidal Basin cherry blossoms in Washington, DC, USA. Photo by Kathy Jentz.

Submissions

If you would like to submit water garden content for the next edition of the *Journal*, please send your submissions **before June 1** to KathyJentz@aol.com.

President's Letter

Hello, Everyone!

As I am writing this letter, our friends in the southern hemisphere are enjoying the last of the beautiful waterlilies...cool relief is on the way, winter is just around the corner, and it's time to bundle up and put your gardens to rest! Here in the northern hemisphere, the earlybirds are chirping just outside my window, the daffodils and forsythia are blooming (earlier than ever this year!). Those of you nearer to the equator and/or living in your island paradise enjoy year-round beautiful weather! I remember visiting Hawaii with my family years ago, and being WOWed by the open-air architecture and lush flora!

Wherever you live, now is the time to plan your visit to our annual symposium for a time of learning, touring, and networking! This year we're going "Back to The Garden" — Longwood Gardens, that is... and the symposium committee is finalizing all the details now. See pages 6-8 of this issue for a preview.

I urge you to make your hotel reservations now! This is a popular vacation area, and you don't want to miss out. Be sure to mention IWGS Annual Meeting for our group rate.

Then, mark your calendar and plan to arrive on Tuesday, August 8 for late afternoon registration and a welcome event in the evening. Our symposium committee is planning a busy three days for Wednesday, Thursday and Friday and you want to be well rested up for it!

This year we will have both a silent and a live auction at the symposium. This is a great way to support our Society and have fun too! Whether you donate or you buy items, please consider contributing. Two years ago in Lawrence, KS., the hot items were quilted bags handmade with loving care by Anita Nelson! Who knows what this year will bring?!

Aside from symposium planning, our all-volunteer board and their committee members are busy with many projects:

- Our new Facebook group page at <https://www.facebook.com/groups/1078865608804114/> is attracting so many beautiful photos of waterlilies and lotus from all over the world...questions asked and answered... if you haven't already, join and see for yourself!
- Currently, IWGS members Jeannie Suffern and James Allison are hard at work scanning old *Journal* copies for us to put on our website to make more information available to all members. Pretty soon you will be able to visit our whole online archive.
- We are excited to see the entries in this year's New Waterlily Competition. Updates have been made on the rules of engagement, and we have a new list of judges from around the globe who really know their waterlilies!
- Progress is being made on the new Victoria Conservancy.
- Ongoing upgrades are being made on our website to facilitate browsing with more information and easier access! Soon the in-depth details of the 2017 IWGS Symposium will be available on the website along with the event registration form.

The IWGS network plays an important role as informer and watchdog regarding legislation that affects our hobby.

- In Spring of 2013, James Allison wrote an extensive article for the *Water Garden Journal* on invasive plants and related issues facing the aquatic plant industry. As stated, many introduced plants become valuable crops

worldwide, while others become invasive and a potential danger to other plant populations and ecosystems. If you get a chance to take a look, this is an excellent article regarding facts, problems, and suggestions from James on this subject.

- For years, Kelly Billing has kept the IWGS up-to-date with an Invasive Plant List she compiles and updates regularly for businesses in the U.S. As laws change, so must we change our plant palette.
- Back in 2010, the Texas government threatened a “White List” of aquatic plants. Unlike a “Black List,” which lists all plants known to be invasive, this list would have been a list of already approved plants; any plants not already on this list would need to go through a rigorous application process to join the list. Thanks to Nelson Water Gardens and friends at the 2010 symposium, this idea was stayed.

Today, many states in the U.S. are worrying about the potential ban of interstate trade of Water Hyacinth, even though for many this tropical species would not be a threat, due to harsh winters. Most recently, we have found that the U.S. Federal government is looking into the possibility of banning interstate traffic of Koi. Although most of us “Plant Geeks” may not be upset about this, many pond enthusiasts would be, and many water garden businesses, garden centers, and fish hatcheries depend on selling Koi.

What’s going on in your neighborhood and how can the IWGS help? This brings up the importance of networking. Be informed- know what’s going on in your country and share this information and get help preventing and/or staying ahead of the game.

We are looking for submissions in the *Water Garden Journal*. Our society wants/needs this diversity in topics, so if you have something in mind, please write for us. From short and simple to more in-depth studies, all entries are appreciated. Over time, we have been able to read so many fascinating articles by so many contributors. Please consider contributing: Book reviews, new plant discoveries, travel tales, and descriptions of your special moments in the garden and more are always welcome! Submit your article for the Summer 2017 edition of the *Water Garden Journal*, please send it to kathyjentz@aol.com by June 1.

In closing, I would like to quote our friend Jim Purcell, who once said, “Symposia are the ‘Glue’ that holds our little group together.” The touring and seminars provide the structure in which socializing and networking occur. With each symposium I attend, I come away with new ideas on growing and displaying aquatic plants, and much, much more! I feel so lucky to have friends from all over the world who share my passion... and for the opportunity to learn so much from each other.

See you in The Garden,

Sincerely,

Susan Davis

IWGS President

we@watersedge.com

Home Gardening Corner

6 Great Ground Covers for Pond Pathways

You're one of the lucky ones! You have a beautiful backyard that's graced with a refreshing pond that soothes your soul and invites critters and humans alike to enjoy. Since you spend a lot of time in and around your pond, you need a durable groundcover that can withstand lots of traffic. Check out these six fan favorites to aid in naturalizing the look of your water feature. (Special thanks to Matt Zerby, President of Wasco Nursery and Landscape in Wasco, IL for his assistance in choosing the top contenders!)

• **Elfin Thyme** (*Thymus serpyllum* 'Elfin')

The purple blooms of this ornamental herb are displayed upon tiny evergreen leaves. The aromatic foliage will spill over edges of rocks and can withstand light foot traffic. Tuck this charmer in between stepping stones. Zones 4-8.



• **Platt's Black Brass Buttons** (*Leptinella squalida* 'Platt's Black')

This fuzzy carpet-like perennial displays striking bronze-black fern-like leaves. Tiny yellow flowers bloom in the spring, adding to this plant's appeal. Great for rock gardens and planting in between flagstones, it fills in quickly to help prevent the spread of weeds. Enjoys moist, shady areas. Zones 5-10.



• **Irish Moss** (*Sagina subulata*)

Small white flowers dance in the spring on the deep green foliage of Irish Moss. Perfect for using along walkways or between stepping stones. This evergreen perennial is hardy in Zones 4-8.



• **Scotch Moss** (*Sagina subulata* var. *glabrata* 'Aurea')

Lush, light green to yellow moss-like foliage creates a soft mat underfoot, tolerating moderate traffic. Tiny white flowers appear in the spring and add to this evergreen perennial's charm. Zones 4-8.



• **John Creech Stonecrop** (*Sedum spurium* 'John Creech')

When you need to smother weeds, this scalloped green-leaf groundcover is the perfect solution. Pink flowers in the fall create a colorful layer. Great for tucking in between rocks. Zones 3-9.



• **Blue Star Creeper** (*Lobelia pedunculata* syn. *Pratia/Isotoma*)

Tiny, light-blue star-like flowers appear in the spring between the tiny green leaves of this creeping perennial. Great for filling the edge of the pond as this little darling enjoys getting its feet wet.



Can be used between stepping stones and other areas of high traffic. Zones 5-9.

Article Source

Aquascape, St. Charles, IL, USA. www.aquascapeinc.com.
Photos courtesy of Midwest Groundcovers.



Longwood Garden's famous fountains.

IWGS Symposium 2017 Dates and Details

by Kelly Billing

The 2017 IWGS Symposium will be in the Philadelphia of Pennsylvania, USA, from August 8-11. This annual meeting is the place to be for water garden industry networking and learning.

In 1982, Charles Thomas planted a seed among other waterlily enthusiasts for creating a society. He fertilized it relentlessly, bringing together all facets of water gardeners. Shortly thereafter, the Waterlily Society was born. The Annual Symposium has been instrumental in uniting like-minded individuals and organizations to share their knowledge and passion. A practice that is instrumental in furthering the hobby and the industry. It is with great pride that we look forward to continue uniting the water garden industry in a cooperative and collective way.

This year we are going "Back to the Garden;" Longwood Gardens, that is. It will be the third official visit in 30+ years of IWGS Symposia. One of the world's great gardens, Longwood's story is one of legacy, in-

novation, and stewardship, as well as history, horticulture, education, and a vision for the future.

Speaker Program

Water garden designer Anthony Archer-Wills will be our keynote speaker. A true pioneer and artisan, he developed new water gardening techniques while completing his first large-scale projects for Safari Parks in England, and Bear Park in Scotland. By the mid-1970s, his techniques were adopted worldwide as the industry standard for building water gardens. Anthony has gone on to create more than 2,000 water features in Great Britain, France, Italy, Luxembourg, Switzerland, South America, Argentina, and Turkey, as well as the United States. He will address waterlilies full circle, "It was Patrick Nutt and Longwood Gardens that moved my love of the waterlilies forward in a quantum leap!"

Laura Bancroft of Ten Mile Creek Nursery is an experienced lotus grower with over 200 varieties. Her wealth of knowledge is an extension of her work in cooperation with The Lotus Project at Auburn University. She will talk to the group all about lotus.

Tim Jennings, curator of aquatic plants at Longwood, will be presenting from the waterlily pools and treat us to an education on the Victoria.

Kathy Jentz, your *Water Garden Journal* editor, will speak on “Social Media for Horticultural Professionals.” She will cover Twitter to Houzz and beyond.

There will be an “Expert Panel Discussion on Waterlilies” led by Tamara Kilbane, Senior Horticulturist, Aquatics at Denver Botanic Gardens and the International Waterlily Registrar, It will cover the realm of waterlilies from basic to advanced. What’s new as well as the panelists favorites.

We will also have presentations from the expert horticulturists at the public gardens we visit.

Garden Tours

We will visit a number of Pennsylvania/Delaware public gardens and nurseries. They include the follow destinations.

• Chanticleer

786 Church Road, Wayne, Pa 19087

www.chanticleergarden.org

Chanticleer is one of the great gardens of the region. Once the Rosengarten estate, today’s Chanticleer is a colorful, contemporary garden within an historic setting. Come discover why London’s Financial Times calls us “planted to perfection” and Garden Design magazine says we are “America’s most inspiring garden.” Chanticleer will be hosting a special dinner for attendees in the gardens.

• Longwood Gardens

1001 Longwood Road, Kennett Square, PA 19348

www.longwoodgardens.org

One of the world’s great gardens, Longwood’s story is one of legacy, innovation, and stewardship. History, horticulture, education and a vision for the future. Our attendees will experience sunrise at the waterlily pools, a behind-the-scenes tour of the newly renovated main fountains, Victoria and Waterlily talks, a look at the IWGS International Waterlily Competition, and the world-famous Fountain Show featuring 750 jets in changing patterns.



Longwood Garden's waterlily pools.

• Mt. Cuba Center

3120 Barley Mill Road, Hockessin, DE 19707

www.mtcubacenter.org

Gardening on a higher level, Mt. Cuba Center inspires an appreciation for the beauty and value of native plants and a commitment to protect the habitats that sustain them.

• North Creek Nurseries

388 N Creek Road, Landenberg, PA 19350

www.northcreeknurseries.com

The nurseries’ mission is to propagate and market plants that develop the relationship between people and sustainable outdoor environments. Their vision is to be, in our customer’s judgment, a leader in the development and practice of sustainable horticultural systems, producing world-class plant material. Our Values include working in and promoting sustainable environments while delighting our customers and providing opportunities for continuous learning.

• Terrian at Styers

914 Baltimore Pike, Glen Mills, PA 19342

www.shopterrain.com

Be ready to be inspired; creativity on another level. Terrain is a wealth of design, style and innovation in outdoor living. Garden related wares, rare plants, landscape services, gifts, and decor for the most discriminating taste.

• Turpin Landscaping

They are planning some surprise private garden tours that are certain to be incredible.

• Winterthur

5105 Kennett Pike, Wilmington, DE 19807

www.winterthur.org



Winterthur's Glade Garden. Photo by Ruth N. Joyce.

Founded by Henry Francis du Pont, Winterthur (pronounced "winter-tour") is the premier museum of American decorative arts, reflecting both early America and the du Pont family's life here. Its 60-acre naturalistic garden is among the country's best, and its research library serves scholars from around the world. We invite you to visit and explore this place of beauty, history, and learning. We will have lunch and guided tours of the gardens with a special staff presentation.

Accommodations

We will meet at the Wyndham Garden Glen Mills, Wilmington 1110 Baltimore Pike, Glen Mills, PA 19342. The hotel is minutes away from I-95, near downtown Philadelphia, and the Philadelphia Airport. For reservations, call 610-358-1700 (ask for Ryan Simkins at ext. 2132 and mention IWGS) or go to <https://www.wyndhamhotels.com/groups/iwgs-annual-meeting>. Our group rate is \$134.95 per night including a hot breakfast, and the rate is good for both pre- and post-meeting dates.

About the Area

The Brandywine Valley of Chester County, PA, USA, is known as a lush, historic area with golf courses, farms, gardens, parks, wineries (including Chaddsford Winery), and museums galore. Make time during your visit to the neighboring cities of Philadelphia, PA, and Wilmington, DE. Within 5 to 10 miles of our hotel's location are many fine recreational and cultural at-

tractions as well as a host of restaurants, universities, breweries, and more. And don't forget that shopping in nearby Delaware, just two miles away and tax-free!

Also, note that Washington, DC, is about two hours south on I-95 and New York, NY, is about two hours north on the same interstate highway.

General Information/Links

- Brandywine Valley Attractions
<http://www.brandywinevalley.com/>
- America's Garden Capital Region
<http://americasgardencapital.org/>
- Philadelphia, PA Attractions
<http://www.visitphilly.com/>

Silent Auction Donations

All packages must be shipped to arrive by August 1st and must be clearly marked on the outside IWGS Donation. Send to: MAN, Attn: IWGS Donation
3427 N Furnace Road, Jarrettsville, MD 21084.

More details and a registration form will be available at IWGS.org in coming weeks and will also be included in the summer issue of the *Water Garden Journal*.

About the Author

Kelly Billing is with Maryland Aquatic Nurseries, Inc. and is on the IWGS Board of Directors.



The Winterthur Reflecting Pool is surrounded with containers filled with colorful summer annuals. Photo courtesy of Winterthur.

Events Calendar

Here is a listing of water garden-related events from April 1 to October 1, 2017, taking place around the world. If you would like to submit 2017 water garden events for the next edition of the *Journal*, please send your listing before June 1 to KathyJentz@aol.com.

Green Vista Water Gardens' 12th Annual Pond College

April 8-9, 2017

Springfield, OH, USA

Green Vista Water Gardens 12th Annual Pond College is Saturday, April 8th 10:00 AM - 5:00 PM & Sunday, April 9th 12:00 PM - 5:00 PM at Green Vista Water Gardens, 4034 Dayton-Springfield Rd, Springfield, OH. Class topics include basic pond construction, care & selection of hardy & tropical aquatic plants, algae control, fish care & predator control, and many others. Individuals will leave brimming with knowledge on basic principles to successfully design, construct, and stock a backyard pond - along with all the trick and time-honored practices any new or experience pond owner should know. Cost: \$12 per class -or- \$10 per class if you sign up for 3 or more classes. Our registration deadline is April 6th — sign up by phone, email, or stop into our store. Online Information: <http://green-vista.com/pondcollege.htm>.

2017 Pond-O-Rama Tour

June 24-25, 2017

St. Louis, MO, USA

The St. Louis Water Gardening Society will present its 17th annual water garden and pond tour, Pond-O-Rama. The 2017 tour has 40 private gardens owned and maintained by Society members. The gardens are located throughout the St. Louis metropolitan area, including in Illinois. This self-guided tour is arranged each day by geographic location. Tickets covering both days of the tour are \$15 each. This event provides funds for the St Louis Water Gardening Society to continue their civic project to plant and maintain the reflecting pools at the Jewel Box in Forest Park.

The tour ticket booklet gives location addresses, descriptions and driving directions. For more information, call (314) 995-2988. Tickets are available by mail order in early May at: www.slwgs.org.

Annual WaterLily & Lotus Festival

July 15, 2017

Washington, DC, USA

Held at the Kenilworth Aquatic Gardens. There'll be music, cultural arts and crafts, live animal exhibit for kids, and more. The lotus and waterlilies will be in full bloom throughout the seven acres of the National Park Service's only site dedicated to aquatic plants. More information: www.friendsofkenilworthgardens.org

Lotus Jazz Night

July 22, 2017

Washington, DC, USA

The second annual Lotus Jazz Night held by the Friends of Kenilworth Aquatic Gardens, National Capital Parks-East, and the DC Promise Neighborhood Initiative features incredible live jazz at Kenilworth Aquatic Gardens to celebrate the end of this year's week-long waterlily and lotus celebration. Bring family, friends, and a blanket and picnic to enjoy this show along with the jaw-dropping backdrop of the pink American lotus. See www.friendsofkenilworthgardens.org

MN Water Garden Society Tour

July 29-30, 2016

Minneapolis and St. Paul, MN, USA

The Minnesota Water Garden Society hosts its 20th annual water garden tour hours are 9 a.m. to 5 p.m. both days. The self-driving tour features about a dozen water gardens in the Twin Cities metropolitan area. By early summer, descriptions of the sites, a map, and information about ticket prices and how to purchase them will be available at www.mwgs.org.

LilyFest 2017

September 23, 2017

San Angelo, TX, USA

The event will be held from 9:00 am to 2:00 pm. There will be tours, seminars, a plant sale, food, and entertainment on site as well. You will see more waterlilies on display than at any other garden in the USA. For enthusiasts, hobbyists, those who hybridize, photographers and videographers, it is a must see event. For information, go to: <http://www.internationalwaterlily-collection.com/?project=lilyfest-2016-news-updates>.

Book Review

Illustrated Aquatic and Wetland Plants in Harmony with Mankind

Author: Dr. Subir K Ghosh, Standard Literature Company, Delhi, India, 225 pages

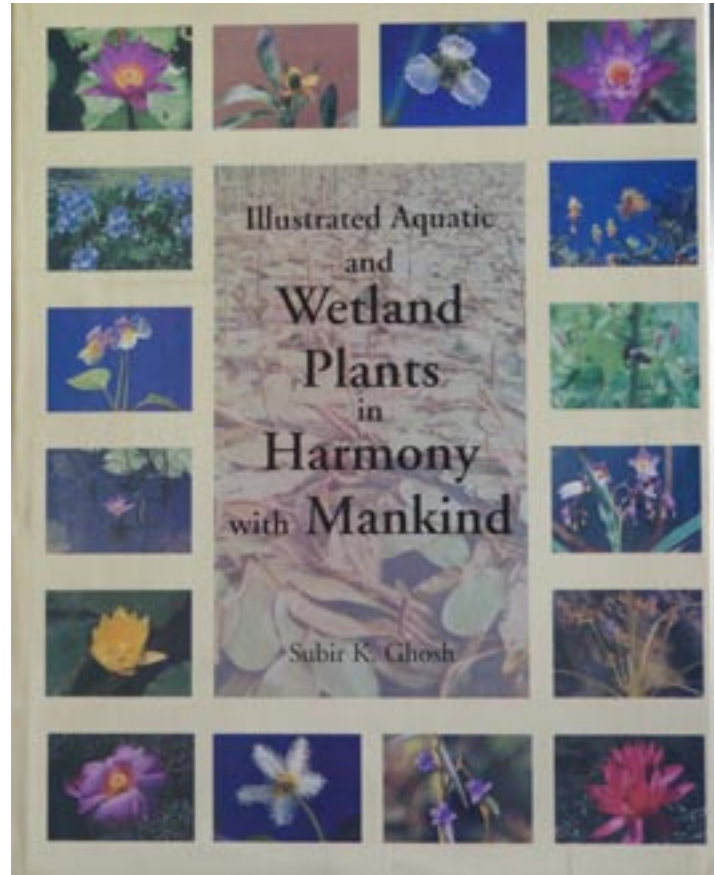
Tropical wetlands and wetland plants in many geographical locations play a very vital role (other than their rich biodiversity) as valuable subsistence resources in livelihood support for a class of people who have no other option but to draw sustenance from them. Millions of dollars are spent annually in developed countries for conservation and restoration of wetlands, whereas the same amount of money is hardly budgeted in the under-developed countries for the marginalized populations living in poverty.

In India, like other tropical countries, rural people with their traditional knowledge have been engaged in protecting their wetlands, from the dawn of the civilization. This topic has been brought up earlier in some places, but has not been communicated properly in the other parts of the world. The book, "Illustrated Aquatic and Wetland Plants in Harmony with Mankind" is the initial step towards addressing the world-wide issue.

This book deals with more than 150 aquatic and wetland plants, quite a good number of which are linked with the existence of the local rural at least up to subsistence level. Without doubt, this is not an exhaustive account of the total floral diversity of the wetlands of West Bengal, India. There are many plants, especially grasses and sedges, which mostly have been left out of this work, though there is detailed information about them. They merit separate and more detailed treatment at a later stage.

The book has short-listed some of the more common plants, which have clear ecological, economic, medicinal, and social values, along with some rare plants. The idea was to promote the cultivation of the economically valuable aquatic and wetland plants, especially helping the nontechnical wetland lovers, wetland plant watchers for understanding their ecological domains, their utilities so that they can make an informed effort towards that end.

Organized cultivation and marketing of these resources can help mitigate the widespread poverty in



the developing countries. At the same time, some rare species have been mentioned precisely because they are now threatened or will soon become so due to human interference.

This effort encompasses the survey of nearly 100 major and more than 200 minor wetland sites from all the 18 districts of West Bengal, India, barring the upper reaches of Darjiling district to the Bay of Bengal. There are, of course, many other sites, some surveyed, some left for a future date. The survey also covered several districts of Bangladesh and a few sites in Malaysia and Canada.

This book is not intended to be a floristic or taxonomic study, but the work has been decidedly ecological in nature. The first chapter of the book is started with a short introduction to introduce the type of water bodies and their resources in the study areas followed by a general discussion on tropical wetlands in the second chapter.

Obviously, an attempt has been made there after to compute the biodiversity of plants in wetlands with special reference to West Bengal in comparison to India and the world. It needs no mention that this information is the reflection of the present status

and that may change in course of time. Biodiversity of pteridophytes, monocot and dicot species in true aquatic habitats have been computed with overlapping wetland families and their counterparts in the terrestrial habitat. The fourth chapter includes a "Field Identification Key" based on the field identification notes. This chapter is unique in this book. An attempt has been made to make the book accessible even for a nontechnical person to identify the species from their ecological perspective with lucid taxonomic features along with photographs of their ecological domain and close up photographs as mentioned in the key. The identification key thus prepared is designed to help the field workers without adequate botanical knowledge.

The fifth chapter deals with the description of the plants in a nutshell. Plants described in this section have been divided according to their growth form like submerged hydrophytes, free-floating hydrophytes, floating leaf hydrophytes, floating stem hydrophytes, and emergent hydrophytes. For good reason, therefore, the first aspect of each plant that this book has dealt with has been its "Habit and Habitat Ecology." Under this heading has also been emphasized each plant's ecological companions, whether hydrophytes, insects, or other animals. In some cases, mention has been made to warn about the plants' potential to become a pest, and in some cases mention has been made on how to biologically control them. No plant is an unmitigated evil, each having its own place in nature. Decisions about whether any plant needs control will depend upon the knowledge of its ecological significance.

Attempts have been made to mark out the habitat of the plant and describe its habits, so that people working on the field can actually look for such plants, or recognize them when they find specific plants. That work is sought to be aided further in the field identification note, where key aspects of the plant's physical features have been mentioned, and appropriate pictures chosen to help easiest spotting of the plant.

Phenological characteristics have been dealt with under that heading. This describes the plant through its life cycle: its leaf flush, leaf loss, methods of regeneration, etc. It must be re-emphasized here that wide variations of phenological aspects of almost every plant have been mentioned, because each of them differs in their phenology (a series of activities observed in

vascular flowering and non flowering plants like leaf flush, leaf loss, flowering activities, pollination where applicable, seed dispersal and germination) in vastly different geo-climatic conditions as well as changed physico-chemical parameters of soil and water.

Under the heading "Uses" are descriptions of popular and local uses, and the economic values and socio-economic status of each plant. In this section, too, one will find the ecological significance of a plant in maintaining other plants and animals in the ecosystem. Then, of course, there are the medicinally useful plants, which have always been known to our ancestors and which still serve mitigate various physical distresses of the rural poor.

Under "Distribution" mention has been made of those areas, which were surveyed by the author. Further information from anyone about other areas where the plants are found will be enriching. Similarly, if concerned persons find any useful plant gradually becoming more rare, it will be in the interest of all for them to report back to concerned authorities that can take conservation measures.

The sixth chapter deals with the economic potentialities of the commercially viable aquatic and wetland plants and an introductory account of the traditional commercial practice with special reference to the eastern India and a part of Bangladesh. Details of the traditional practice will be in a separate book in the near future.

The final seventh chapter mostly deals with management of aquatic and wetland vegetation, their role in pollution abatement, steps towards restoration and creation of wetlands in the industrial sites and future needs particularly in the field of rehabilitating biodiversity. A Glossary and a Bibliography with more than 400 references have been appended in the end. In some cases, references to scientific works have been made directly in the text, notwithstanding the Bibliography.

The book's forward was written by Dr. Christopher David Kentish Cook, formerly Professor of Systematic Botany at the University of Zürich, Switzerland. He is a member of an UNESCO and FAO panel of experts on aquatic vegetation. He was Fellow of the Linnaean Society of London; honorary member of the Bavarian Botanical Society, and the Botanical Society of Zürich. He is the author of several internationally reputed

books like “Water Plants of the World,” “Aquatic and Wetland Plants of the Indian Subcontinent,” “An Aquatic and Wetland Flora of Southern Africa,” etc. He has more than 130 research articles in his credit which are mostly dealt with revision works, flora, distribution of aquatic and wetland plants, nature and origin of species, aquatic weeds etc. around the globe.

He writes: “ ‘Illustrated Aquatic and Wetland Plants in Harmony with Mankind’ by Dr. Subir K. Ghosh covers about 150 aquatic and wetland plants of the tropical climate. Aquatic and wetland plants represent only a relatively small part of the world’s floristic richness; yet their importance is often underestimated. The Water Hyacinth (*Eichhornia crassipes*), for example, has been called the world’s worst weed. Indeed, when it invades tanks and irrigation canals, it can present a serious threat to mankind. But a weed is a plant, which is, at a given time, not wanted, where it is growing. Water Hyacinth is not always a weed; it can be a very desirable plant which can be used to purify water, make furniture, used as mulch or compost, and as a source for various chemicals. Contained in a garden pool it is a very beautiful object.

“Dr. Subir Ghosh has chosen about 150 important aquatic and wetland plants, which grow in West Bengal. His choice is a wise one based on many years of living together with these plants in their habitats: he has also studied the rural people who also live with these plants. Each of his chosen species is carefully described using easily seen characteristics and illustrated with colored photographs; keys for the identification are also provided. However, a great merit of this book is that he tells us how these plants live and also the local humans live with (or even from) them. It may come as a surprise to many, to learn that more than 20,000 rural people in West Bengal are engaged in the management and marketing of products obtained from hogla (*Typha ssp.*). In West Bengal alone, at least 3000 families get their total sustenance from this plant. More than 1,000,000 people earn their living from shola (*Aeschynomene aspera*). In this book Dr. Ghosh lists other aquatic and wetland plants which are used by people. It is remarkable that these important economic plants are all wild species growing in natural or nearly natural habitats without any ‘hitech’ interference. The wetlands and their plants are not only of direct value to humans but are essential to the

life of many animals, particularly birds.

“However, not all is well in the State of West Bengal; though pollution and general mismanagement of natural resources many wetlands in West Bengal are being damaged or even destroyed and, as pointed out by Dr. Ghosh, some species have become rare and are in danger of becoming extinct.”

Dr. Dhruvajyoti Ghosh, Global 500 Laureate of the United Nations and recent recipient of Lucc Hoffmann award of the IUCN wrote about the book: “Dr Subir Ghosh has created a book *Illustrated Aquatic and Wetland Plants in Harmony with Mankind* that preserves the history of wetland biology unmatched in this part of the country. A glorious trinity of knowledge, photography and love for nature. “

About the Author

Ghosh, Subir Kumar; BSc (Bot Hons), MSc (Bot), BEd, PhD (Ecology); Educationist & Ecologist Educ Calcutta, Kalyani and Jadavpur Univs; specialisation in: Wetland Ecology, Biodiversity of Aquatic Plants, Biodiversity Rehabilitation, Macrophyte-based Waste Water Treatment; Formerly Scientist (on lien), West Bengal Pollution Control Board, Environment Dept, Govt of West Bengal 2001; Consultant Ecologist: Creative Research Group, Kolkata, PAN India Group, Kolkata; Life Member: Inst of Landscape, Ecology & Ekistics, Indian Asscn of Biological Scs, The Zoological Soc, National Botanical Soc; Member, International Mire Conservation Group (Germany); participated in more than 60 national and international conferences. Dr. Subir K. Ghosh is CEM member, IUCN and member, IWGS.

Post-Symposium Report The Quest for *Nelumbo lutea*

By Demi Fortuna

The post-symposium expedition into the wilds of Campeche State in the southeastern lowlands of the Yucatán Peninsula, Mexico, sounded like a Gordon Lightfoot ballad, or an Indiana Jones adventure, and for good reason. It had all the makings of a great story. A famous scientist from across the globe had unearthed three mysterious botanical specimens collected years before the Second World War. He needed help in his quest to confirm whether the near-mythical plants described still existed in the wild, far to the south in Mexico. The scientist called upon a society to which he belonged, little known to the rest of the world, of adventurers from all walks of life strongly united by a common fascination – the cultivation of two of the oldest and most venerated of all plants known to man – *Nymphaea* the waterlily and *Nelumbo* the lotus.

The particular species in question, *Nelumbo lutea*, the American Yellow Lotus, could not be more quest-worthy. An aquatic giant of great beauty and mystical properties, its huge circular leaves can reach two feet in diameter as they stand proud as much as three feet above the water's surface. Nothing sticks to the flat green platters; they can't get wet and they don't stay dirty, reason enough for Native Americans to revere the lotus as a sacred plant. Modern reverence of the "Lotus Leaf Effect," the extreme water repellence we call hyperhydrophobicity, has led to magic impermeable coatings for cars and electronics (and water fountains — <https://hackaday.com/2016/06/24/a-fountain-of-superhydrophobic-art/#more-210855>). Amongst the leaves, huge blossoms of clear yellow open for two days, then drop their banana-sized petals to leave behind the emblematic showerhead seed pod that defines them. Dried and dormant, the seeds remain viable for decades, even centuries, but can be sprouted in 6 days when needed.

One of a small number of plants to fruit and flower simultaneously, the American Lotus provided even more nutritionally than spiritually to Native Americans, much as its cousin the Asiatic Lotus does today in China. Well-known across the North American continent, its many common names speak to its bounty: Pongnut, Duck Acorns, Rattle Nut, Yockernut, Alliga-



On the hunt for the American Yellow Lotus. Mike Swize, Laura Grant, and Bob Ramik in the trackless wetlands of Palizada Campeche, Mexico.

tor Buttons, Monacanut, Water Nut. A staple food of the Comanche, Dakota, Huron, Meskwaki, Ojibwa, Omaha, Potawatomi, and many other peoples, the whole plant was eaten (and is delicious!). The hard seeds, up to 19% protein, were eaten raw like nuts, added to thicken soups, roasted like chestnuts, or dried and ground into flour to make bread. Their high oil content means they can be popped like corn as well. The sweet, starchy tubers were harvested in the fall and would keep all winter long, to be boiled, roasted, dried, and ground into flour or just eaten raw. In the spring, young and newly unfurling leaves were eaten uncooked or boiled like spinach.

The Yellow Lotus is thought to have originated in the Mississippi Valley, but its great value as a nutritious, transportable, storable food source meant it would be carried and cultivated across the Americas, from Canada to the Caribbean and beyond. Some sources claim that native populations extend to the south from Mexico and Central America all the way to South America, while others believe those populations were imported ornamentals that escaped into the wild and naturalized. Only one method known could prove their provenance — DNA analysis of an isolated population and comparison to other known populations. And there was only one man in the world who had all the data needed for that comparison.

Daike Tian, long-standing IWGS member and scientist, who has dedicated his career to documenting the distribution of *Nelumbo* in the wild across the globe, had located evidence from the late 1930s reporting the existence of the Yellow Lotus in Mexico, far to the south of its nominal range. An honored guest and lecturer at past symposia, Daike couldn't make it to Mexico for this one, but was excited nonethe-

less that we would be going to the Yucatán Peninsula. We would be close to two of the three sites named in his research! He sent photocopies of pages from the Arnold Herbarium Collection of Harvard University indicating the general areas of two distinct populations along the lowlands of the Gulf Coast, and challenged us to confirm the almost 80-year old reports. We had our Quest – but first, the reason we were there.

The 31st International Waterlily and Water Garden Society Symposium, the first held in Mexico, was hosted this year in an extraordinary colonial city, Mérida, capital of the State of Yucatán and twice Cultural Capital of the Americas, the only city to ever be honored more than once. The White City, so named for the limestone of which it is largely constructed, was chosen for its accessibility, its hospitality and its long and storied history. We would be able to travel through time, swimming in ancient ruins, touring Colonial palaces, enjoying the vibrant present in a modern, cosmopolitan capital with beautiful weather – and waterlilies.

Founded on the site of a Mayan temple whose stones were used for the first Cathedral built in the Americas, Mérida became the seat of power in the southeast of Mexico for four centuries. Its cultural ties have always been stronger to Europe than to the rest of Mexico, which is separated from the Yucatán Peninsula by more than just cultural boundaries. Vast, almost impenetrable swamps cut the Peninsula off from the mainland so completely they were only breached by modern highways and railroads in the 1960s. Near total autonomy before the Mexican Revolution led the Peninsula to fight for its own independent status as the Republic of Yucatán, alongside the Republic of Texas, in the 1830s and 1840. Yucatán was only forced into Mexican statehood when Texas was accepted into the Union, removing the fledgling but effective Texan Navy from the fray and effectively ending the war for independence.

Yet, even in statehood the Free and Sovereign State of Yucatán, as it is properly known, stands proudly apart. The indigenous Maya, who still make up 60% of the modern population of Mérida, survived the Conquista stronger than many other indigenous groups. The resurgence of their cultural heritage in the 21st Century provides a better glimpse into a past that stretches back thousands of years than ever before.

New and better-funded museums and archeological sites offered a rare opportunity for symposium attendees to experience waterlilies and archeology simultaneously, in the ancient cenote of Dzibilchaltún where they swam with the same lilies the Maya harvested for 60 centuries.

In the 19th Century, the Green Gold of the Yucatán, henequen, the agave from which sisal rope is made, brought unbelievable wealth to the area, and Mérida was the place to show it off. The wealthiest henequeros moved from the Haciendas where the rope was produced to magnificent pastel mansions designed by the costliest European architects, all along the nouveau boulevard of the nouveau riche, the Paseo Montejo. We drove past those beautifully preserved mansions on our way to tour a working Hacienda and henequen plantation. The hotel where we stayed lay steps away from the 16th century plazas and churches in the Centro, the heart of Colonial Mérida. We would experience thousands of years of history in four days, guided by native Meridians and under the aegis of the local botanical research center and gardens, The Center for Scientific Investigation of the Yucatán, or CICY.

Dr. German Carnevali is not only Director of the Herbarium at CICY, he is a foremost authority on the botany and distribution of the plants of the Yucatán. He knew that one of the sites that Daike had located, near the resort area of Laguna Silvituc, held lotus, but wasn't sure whether they were native or introduced. He was much more intrigued by the second site deep in the central swamps of neighboring Campeche State. Few ventured that deep into the wetlands, and those that had returned with reports of deadly wildlife and dangerous roads. The area was almost completely isolated, accessible only by water, possibly only by canoe. If a population were to be found there, near the headwaters of the Rio Palizada, it would almost certainly be native. He gave us all the information he had, and a mandate.

And, so began the quest for the wild *Nelumbo*. There were eight of us, from all over North America. Tish Folsom of Springdale Water Gardens hails from Virginia, Mike Swize of Nelson Water Gardens from Texas, Jim Purcell of Oregon Aquatics, David Curtright from Escondido California. Robert Ramik, and Laura Grant traveled from Toronto, Canada. I'm a Long Islander and we were blessed by the presence

of my dear friend and now guide, native Yucateco Jose Ignacio ‘Nacho’ Barroso. He and his wife Lidia had provided invaluable assistance and done all the groundwork for the symposium; now Nacho volunteered his van and his time to help us find a single stand of lotus in a wetland the size of Rhode Island.

First, the easy part. Of the two populations that hadn’t been seen since 1939, one was relatively accessible, in the resort area around Lake Silvituc. We planned our route to pass areas where we might also find waterlilies, and visited three ojos de agua, literally “eyes of water” so named because the springs make clearings in the jungle where the cool blue waters stare up at the sky. We found what we expected to find in the obvious spots, *Nymphaea ampla*, the beautiful white Mexican native, common in the springs, rivers, and pools we saw and stopped at along the way. We had one exciting surprise, in a roadside ditch a local passerby warned us was full of culebras, snakes. He stayed to watch someone get bit as Mike, Jim, and David somehow identified the much less common waterlily *Nymphaea jamesoniana*! Unfortunately for the onlookers, no one died, which we celebrated almost as enthusiastically as we did the discovery of this beautiful white flower.

Back in the van, considerably pleased and badly in need of refreshment (and showers), we headed back on the road to Silvituc. We knew we were close and pulled into the parking lot of a pretty little hotel and restaurant, and had immediate cause to celebrate again – we had mistakenly stumbled into a lakeside resort next to a cove filled with lotus! The lovely hostess Felicidad invited us in to see whatever we liked, and was only slightly scandalized as Jim stripped and jumped right in, followed by Mike and David.

I have to admit we were slightly disappointed by how easily we found the first population of our “elusive” quarry. We expected to fight our way through crocodile-infested swamps filled with bat-sized mosquitos and giant leeches that could drain you dry in a matter of minutes. The closest we had come to killer crocs was on the menu at the crocodile farm in Isla Arenas (yummy! tastes like a cross between chicken and pork). We did not expect to stop for a beer and find lotus practically at the table. We headed back onto the well-maintained, two-lane highway to Escárcegas, the crossroads of Campeche State, where we would

start the real expedition, the scary, daring one that we were all excited about. We were not disappointed.

First, the drive. To get to the area of the second, much more elusive population we had to drive six hours northwest on bad roads into the Campeche lowlands. Sugar cane replaced corn, and was in turn replaced by rice as we headed up into the wetlands on the only road into the swamps. But though the topography was uninspiring, the quantity and variety of birds in the fields increased from sporadic to spectacular! Raptors and vultures, spoonbills and rails, herons and egrets, and cranes, oh my! By the time we reached the end of the rice fields our necks were sore from craning left and right as we passed multicolored flock of multiple species in flight. (Tish wants to lead a birding expedition to the area, it would be amazing.) But we had other prey in mind.

The road, which had followed the Rio Usumacinta along the Tabasco-Campeche border, split off to follow the Rio Palizada, a tributary that led to the town of the same name, our only clue to the last potential population of *Nelumbo*. As the road narrowed to a single bumpy lane past the ranchos and through the jungle along the river, it was beginning to look like a real expedition. Silvituc Lagoon had been too easy, not only for us to find, but also because there were so many thousands of people around the large and lovely lake that the chances that the lotus we found were introduced, rather than native, were quite high. The same could not be said of Palizada. After literally hours of increasingly smaller roads, we found our way to the outskirts of the beautiful little frontier town, where the cemetery and the cannons overlooking the river had just been freshly painted for the upcoming Day of the Dead celebrations. Now we had to figure out where the *Nelumbo* might be. They certainly weren’t nearby the town; the river was in flood, boiling brown, and angry up onto the steps the launches and canoes would use when the waters were lower and calmer. Lotus require still and shallower water than the swift Palizada. We needed to find even more remote backwaters.

Nacho started asking around, trudging through the six degrees of separation that we knew must lie between us and our goal. First, we found a policeman who didn’t know about the yellow flower, but knew the white ones. He sent us to a gas station attendant who knew of a cowboy who knew of the big leaves

that can't be wet. The cowboy happened to be filling up and agreed to help. He, Claudio Ezquibel, would take us to the road his uncle Cruz Ezquibel lived on. We followed the cowboy through the unexpectedly lovely frontier town, over a tiny bridge to a track that disappeared into the forest. He pointed down the tiny dirt road and told us to go as far as we could, and then ask for his uncle. We thanked him and watched him drive back towards Palizada, which had somehow become "civilization" in contrast to the heart of darkness before us. Improbably, after another 35 minutes down the trail, dead-ending at the river, and a trek back on foot to the only house in sight, we had found Don Cruz Ezquibel. Yes, he knew of the flower, it grew in the Lagoon of the Wind, many miles into the Wetlands, accessible only by boat. But it was late, almost dusk, we would want to start early the next morning – we surely wouldn't risk the "aguadas" at night?

We weighed the risks against a tight time schedule. We were 12 hours from Mérida assuming all went perfectly well, but it was late Sunday and there were planes to catch Tuesday morning. We took a quick vote and assured him we were game. He sent his daughter back down the trail on a bicycle to find his son who would take us all in the open launch that they used to move the horse to pasture on the other side of the river. We agreed and waited for Cruz hijo to arrive. He was far more than dubious, but obeyed his jefe (literally, chief) and took us around back to the launch pulled up on the river bank. We quickly helped Cruz Jr. mount the outboard, quietly moved the tick infested saddle to the shore, climbed aboard the open launch and away we went.

For the first half hour of the trip, we ran full tilt upriver on the Rio Palizada until we got to a seemingly impenetrable green wall of huge Pontederia, cattails, and reeds hiding a tiny concrete cottage. Cruz spun the boat into an eddy in front of the house and called out to the owner for permission to use the only access through the wetlands to the first hidden lake, the Laguna del Pajaro. Passage granted, he steered the boat along the towering reeds to a tiny break in the greenery. The way through to the Lagoon of the Bird was almost invisible until we were upon it, a narrow slot four feet across laboriously cut through the reeds, barely wide enough for the launch to pass. The water was clear and about eight feet deep in the cramped

channel, set with nets the fishermen use to catch mojarra, the native cichlid that makes up the greater part of the local catch.

After another half-hour of motoring through the floating vegetation that surrounded the launch, stopping every five minutes to clear the prop of the salvinia and roots that fouled it frequently, the passage opened up into a walled-in lagoon a thousand feet across, with millions of waterlily seedlings on the bottom easily visible through crystalline water. Cruz announced we had arrived at the place of the white lilies, and announced with some relief that we would be able to get back before dark and before running out of gas.

Wait – waterlilies? No, we needed to see the yellow flowers, with the leaves that don't get wet. His face fell, almost as deep as the waters around us, but he had promised his father. He would try, he said, as he lifted the near empty gas can, but it was near dark now, we had to hurry. He threw us around and headed to the opposite wall of the lagoon, this time using all the momentum of the boat to get us deep into the leafy canyon of floating vegetation. It almost wasn't enough. After a run of 15 minutes interrupted only by his lifting the propeller to clear the fouling weeds, the passage ended abruptly.

Three huge rafts had broken off from the mass of vegetation and had sailed deep into the passage propelled by the wind catching their towering stalks. We could see around them to the end of the passage, only another 20 feet away. Cruz told us to brace ourselves, and rammed the rafts full throttle. The first mass moved — all of two feet into the second, and we stopped dead. He tried again – nothing. We were faced with the encroaching dark, in a boat facing the wrong way in a passage we couldn't turn around in, with little gas and no hope of getting back without swimming back through the swamps of Palizada with God-only-knew-what lurking under the rafts in eight feet of water. It was a real expedition at last.

There was only one thing to do. We quickly moved to the front of the boat before despair set in, and, bracing against the gunnels, grabbed huge handfuls of vegetation and hauled back on the floating rafts of reeds with all our might. At first, nothing moved, but then, ever so slowly, the prow of the boat started to slide between the first raft and the walls of the passage. There wasn't enough room to go between, but with that tiny

spark of progress and sheer desperation powering our efforts, we pulled the launch up over the reeds and slowly inched forward towards the open water. When Cruz saw what we were doing, he abandoned the back of the boat, grabbed an oar and started poling us forward against the bottom. With a last concerted effort, we literally skated the entire 20-foot launch over the last of the reeds and popped out into the vast open water of Laguna El Viento, the Lagoon of the Wind – miles of it, covered with *Salvinia*, waterlilies – and lotus!

There was literally no time to waste. The sun was setting and we had to find what we were looking for before it grew too dark to see. Dr Carnevali had asked for specimens for the testing labs at CICY, but if we couldn't see them, we couldn't collect them. We spotted leaves across an adjacent cove and headed there, part poling, part motoring through the thick weeds. Leaves, yes, there they were, but no seed pods. When we explained what we were searching for, Cruz explained that the pods were eagerly sought after by many birds, and they were long gone by now. We were crushed. We had only enough light to hit one more spot before dark, and we would be going home blind, but Mike pointed one out from the bow and the halting engine made a last effort.

Nothing. We had failed, the light was almost gone and we were miles from the van, and a full day from Mérida. We headed back along the same path, where the reeds had already been pulled down and out of the way by the boat and the passing was easiest.

And then we saw them. First a single pod where there was none before, then another, along the path we had made through the lotus stalks. We had disturbed the sunken pods, and as we made our way through in the opposite direction, a few had popped to the surface – and they held seeds! We had found what we needed for the genetic analysis by CICY! Now the race for home.

We found the first break in the reeds by following the path we had made in the lagoon. Cruz warned us to get down, gunned the outboard and flew over the reeds just to the left of the floating masses that had blocked the way. We made it far enough in that we could quickly pull and pole our way into the channel, and we were off, leaning in as far as possible to avoid the sharp sawgrass and occasional thorns. We got to the

second opening across the Laguna del Pajaro by sheer luck – and Tish's flashlight, with which Nacho, poised like a carven figurehead over the prow, lit the way back. We were on our way home. We figured it was just a matter of following the narrow passage through to the river – until the engine started sputtering. The gas! Cruz backed the engine down to a few hundred rpm, enough to keep moving, and asked us to look for the nets of the fisherman.

Do you see them? Are we there yet? I looked up to see the brightest Milky Way of my life, so distinct and clear I told myself I could see faint tinges of blue and brown along its length, traversing the sky from horizon to apogee. Do you see them? Yes! The nets! We were at the river! The trip downstream with the engine sputtering was utterly relaxing. We weren't going to have to swim for it, even if we didn't make the shore we would drift to Palizada inside of an hour with the swollen current. We had made it.

We weren't the only ones celebrating our return. The entire Ezquibel family, including relatives who had heard we were in town and tracked us to Don Cruz' home, awaited the return of the launch and its intrepid captain, who had taken eight very strange strangers to the Laguna El Viento and back, in the dark, and lived! The Quest was triumphant, the stuff of legend, of song. We could hear the mariachi already.

About the Author

Demi Fortuna owns August Moon Designs in Stony Brook, NY. He is Director of Product Information of Atlantic Water Gardens and curates the online AWG University. He was named 2014 Waterscaper of the Year by Irrigation and Green Industry Magazine and a 2016 Water Artisan of the Year by Pond Trade Magazine. He serves as an IWGS Board Member and can be reached at demi.fortuna@gmail.com.



David Curtwright holding a lotus leaf in the Laguna del Viento with Tish Folsom at the bow.

Expert Corner

Autism and Koi Ponds

by Mike Gannon

Autism has literally been described as an epidemic in the USA. The statistics coming out are more staggering from one year to the next. Between the years 2000 and 2010, the rate of ASD (Autism Spectrum Disorder) went up 119%. By some estimates, a devastating 1 in 45 American children are affected by ASD.

These are crazy numbers and many American families are struggling with the realities of raising these very special children. The struggle is not just for the ASD child; it is shared by parents, siblings, entire families.

Studies have shown social interactions among autistic children with pets are performed at a higher level. Parents of autistic children have reported “incredible success,” and “fish keeping mellows out autistic children in a way that can’t be achieved in other environments.”

Reports out of University of Missouri Thompson Center for Autism and Neurodevelopmental Disorders state that “pets were beneficial for the children’s social skills” and “data revealed that children with any kind of pet in the home reported being more likely to engage in behaviors such as introducing themselves, asking for information or responding to other people’s questions. These kinds of social skills typically are difficult for kids with autism, but this study showed children’s assertiveness was greater.”

These are pretty profound findings. The addition of a koi and goldfish pond into the life of a family that is dealing with autism can have a significantly beneficial impact on not only the autistic child’s development, learning, and behavior; but the entire family’s relationship. Koi and goldfish ponds are an interest that the entire family can share.

Many children with autism are prone to melt downs and sever temper tantrums. During these difficult times the child can become completely disengaged, unable to focus, difficult to control. Melt downs can occur on a regular basis, sometimes even a daily basis in more challenging cases. During these times the



children benefit from “calm areas,” a designated place to help the child come back to composure. Koi and goldfish ponds can offer a very calming environment for autistic kids. Recovery times from periods of melt down can be accelerated in the presence of a koi and goldfish pond.

Interactions with koi and goldfish can have almost immediate calming effects and more focused attention. What many people don’t realize is that koi and goldfish are a highly social variety of fish, in other words they are not shy. Koi and goldfish recognize their caretakers and readily interact and engage with them, even some light petting is very normal behavior. These fish are comically demanding to have treats of food, eagerly following their caretakers around the pond. With lifespans of 40+ years, their large size up to 3 feet, and outweighing most cats and small dogs; koi and goldfish easily become family pets. The bright colors of the fish, the hypnotic swimming patterns, and their eager cheery disposition can charm anybody and autistic children share that same strong response and attraction to these amazing creatures.

For younger autistic children, koi and goldfish ponds offer tremendous teaching opportunities. Learning words and colors is fun and engaging with koi and goldfish. Eyes, fins, scales, and tails are just a few fun words; lots of vocabulary can be introduced and comprehended. The many colors that koi and goldfish come in allow for the exciting experience of a child recognizing a color to happen again and again. Who doesn’t love when a child points to a big happy koi and says “red fish!”; it never gets old. Counting fish

is so much fun that Dr. Seuss even wrote a book on it! Hanging by the pond counting fish is an activity that can be repeated with every visit to the pond. Learning all the names of fish, and mastering the ability to identify differences in the colors, patterns, and nuances of koi and goldfish is a great mental exercise. Naming of the fish and caring for that living creature is powerful, taking care of “Henry the koi fish” is empowering. Recognizing each koi and goldfish by name is an incredible connection and experience for the autistic child.

Feeding fish is another activity that greatly engages the child and brings a new focus away from the meltdown at hand. The feeding of fish is also a very social activity with lots of opportunity to engage, talk with autistic children; and to ask them questions about their fish pond. Feeding koi and goldfish teaches sharing and offers educational opportunities as well. Many children will also enthusiastically help clean and maintain the koi and goldfish pond as well.

The entire environment of koi and goldfish ponds have an overall soothing effect, they are naturally relaxing. There is something about watery environments. The sounds and movement of the water, the reflections of surroundings on the surface of the water are pure relaxation.

The family dealing with an autistic child, that chooses to have a koi and goldfish pond in their life can also expect to see many colorful song birds visit the pond giving a greater and deeper interaction with nature beyond the fish. Koi and goldfish ponds will also deliver some other critters that will surely delight. An ASD child will be enchanted when the inevitable froggy visitor shows up to the pond, a couple big croaks will undoubtedly draw some laughter. Watching beautiful dragonflies zip around the pond is simply mesmerizing.

There are companies that specialize in creating water feature “calm areas.” The areas they create feature beautifully designed ponds that typically feature a waterfall display. Around the ponds, seating areas are created to provide a comfortable spot to re-compose by the pond. Submersible lighting is installed to allow for any time of day use, and of course the undeniable aesthetic appeal. Beautiful aquatic and landscape

plants are installed to create a complete environment for the entire family to enjoy. The areas are designed to promote peacefulness and relaxation.

With the explosion of autism happening all around us, solutions to help manage this health crisis in-home are sorely needed. Koi and goldfish ponds can be one of the solutions that parents, kids and families are looking for. More awareness is needed for the koi and goldfish pond keeping hobby/lifestyle and the benefits of it, not solely for the ASD child, but for the entire family. Koi and goldfish ponds provide an interest that all people, of every type, ages 1 thru 101 can enjoy and benefit from the healing properties they possess.

About the Author

Mike Gannon is owner of Full Service Aquatics located in Summit, NJ. Mike is an award-winning pond, water garden, and water feature builder. Mike is the creator of “The Pond Hunter” video series seen on Youtube and has made several television appearances on networks such as HGTV and the DIY Network. He also hosts the Pond Hunter Radio Broadcast. You can contact Mike at the LOVEYOURPOND blog at <http://fullserviceaquatics.com>.

Aquatics in the Diet of Early Humans

It turns out we’ve been using water plants in our food for a very long time. Earlier research had identified starch in the diet of Neanderthals in Belgium that most likely came from waterlily rhizomes (PNAS Vol 108:2 486-491, 2011).

Now more recent research, at a site in Israel, has identified a number of aquatics likely to have been part of a very diverse diet for early man (PNAS, pre-publication doi.org/bvgf). The timescale is from a considerably earlier period — hominins living on the site around 780,000 years ago.

Archaeological investigations turned up frequent findings of water chestnut (*Trapa*), and gorgon lily seeds (*Euryale*), and remnants of other plants such as *Nuphar*, *Sagittaria*, *Alisma* and *Butomus* amongst others, and even a few of *Nymphaea alba*.

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A modern art water garden feature in a private garden in Georgetown, Washington, DC, USA. Photo by Kathy Jentz .

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