

Pond & Garden

July - August 2000 • Volume 2, Issue 2

Features

Fountains & Aerators for Large Pondspg 50

Winter Operation of Aerators & Fountains by Willis Dane ..pg 52

Fountains for the Water Garden by Helen Nashpg 56

Houston Pond Tour

by Dan Robinson & the Lone Star ZNA Koi Clubpg 60

Divide & Conquer – Plant Propagation by Paula Bilespg 68

No Special Plan...Just a Lot of Love by Nancy Oylerpg 72

The World of Bamboo by Mila and Gordon Powellpg 76

The Margaret Grigg Nanjing Friendship Garden

by Leslie Muskopfpg 88

Readers' Service

P & G Pond Contest 2000pg 96

Pond Dialogue: Frogs & Toadspg 98

National Club Directorypg 99

Retail Product Source & Service Guidepg 102

Wholesale, Mail-order,

Construction & Maintenance Quick Searchpg 105

Shopping Martpg 107

Got Pond Stuff?... Your Local Retailerspg 109

Advertiser Indexpg 110

Subscription Pagepg 112



50



60



76



10



16

c o n t e n t s

July - August 2000 • Volume 2, Issue 2

Departments/Columns/Short Features

Editorial: Speak Up!pg 4

Goldfish Keeping — Feeding Goldfishpg 6

Practical Ponding Tips from pond club memberspg 7

Seasonal Pondkeeping by Scott Batespg 8

Garden Adventures by Joe Summerspg 10

KoiVet.com by Dr. Erik Johnsonpg 12

Talking About Koipg 13

Summer Bulbs

What To Do When Blooms Are Gone by Sally Fergusonpg 14

Bulb Plants in the Pondpg 15

Guidelines for Building a Natural Wildlife Pondpg 16

Browsing the Web – Water Garden-related Sitespg 18

Skydiving Goldfish!

Pikes Peak Water Garden Society, Kansas Pond Societypg 19

Ask the Plant Man – Cannas & Lotuses by Steve Stroupepg 20

Homemade Barrel Filter

by Beau Roye, Koi & Water Garden Club of North Texaspg 22

Avoiding Air Pocket Obstructions

by Mike Kandt, Kansas Pond Societypg 23

Virtual Village for Pond and Fish Clubs Around the World

by Robert Hollandpg 24

Ask Chuck: Pond Keeping Q & A

by Chuck Rush — Rocks or no rocks?pg 26

Victoria Update — Got a Bathtub? by Kit Knottspg 28

Pond Splash — Practical or Fanatical? by Stephen P. Katonapg 30

Travels with Helen and Marilyn

Wichita, Springfield & St. Louispg 32

Summer Aquatic Plant Pests – Aphids and Beetlespg 34

Summer Aquatic Plant Pests – Moths and Midgespg 36

Summer Aquatic Plant Pests – Leaf Rollers & Japanese Beetlespg 38

Step by Step – Making Upflow Filter Apparatus by Jerry O'Quinnpg 40

Readers' Pond Album – Del & Beth Wiese, Springfield, MOpg 42

Koi Pond Basicspg 44

Design Ideas: Do-it-yourself Garden Topiary by Jacque Alsuppg 46

Foamy bubbles?pg 48

Design Ideas: Let the Water Flow!pg 49



Cover Photo:

Teahouse in the Margaret Grigg Nanjing Friendship Garden at the Missouri Botanical Garden in St. Louis, Missouri.

Photo by H. Nash.
See article, page 88.

Speak up!

While I don't always agree with everything contributors write for the magazine, I try to present varying points of view on pondkeeping. I admit to an ulterior motive in letting Chuck have his unedited, tongue-in-cheek say about methods of controlling frog and toad populations: I hoped to create a dialogue. There is still too little awareness of the lives nurtured and attracted by our ponds. Dialogues, such as what Chuck has prompted, enlighten us all. See page 98 for the beginning of our frog and toad dialogue. We welcome your thoughts, too!

...and for the record, Chuck does not chase toads with lawnmowers. He merely noticed the babies fleeing before his mower. He does not use chemicals in his ponds, and he does, in fact, sit up into the wee

hours, trapping frogs that might eat his fish to relocate them in a nearby swamp. ♡



Editor: Helen Nash
Managing Editor: Marilyn Cook
Asst. Managing Editor: Heather L. Anderson
Computer/Web Services: Joe Cook & Doran Gwyn
Art Director: Rich Barker
Staff Photographer: Ron Everhart
Prepress & Printing: KMJ Enterprises Lebanon, IN
**Contributing Writers
& Photographers:** Jacque Alsup, Scott Bates, Paula Biles, Circle City Aquarium Club, Willis Dane, Sally Ferguson, Green Country Water Garden Society, Robert Holland, Dr. Erik L. Johnson, D.V.M., Mike Kandt, the Kansas Pond Society, Stephen P. Katona, Koi and Water Garden Club of North Texas, Kit Knotts, Lone Star ZNA Koi Club, Leslie Muskopf, Jerry O'Quinn, Nancy & Wally Oyler, Hedy Padgett, Randel Patterson, Pike's Peak Water Garden Club, Gordon & Mila Powell, Dan Robinson, Beau Roye, Chuck Rush, Jr., Shirley Rush, Linda Siler, Springfield Water Garden Society, Steve Stroupe, Joe Summers, Del & Beth Wiese
Portrait of Helen Nash by Ilona Royce-Smithkin
Advertising Director: Angeli Coover
105 Seminole Dr.
New Ulm, TX 78950
phone: 979-992-3870
fax: 979-992-3871

Pond & Garden is published bi-monthly.

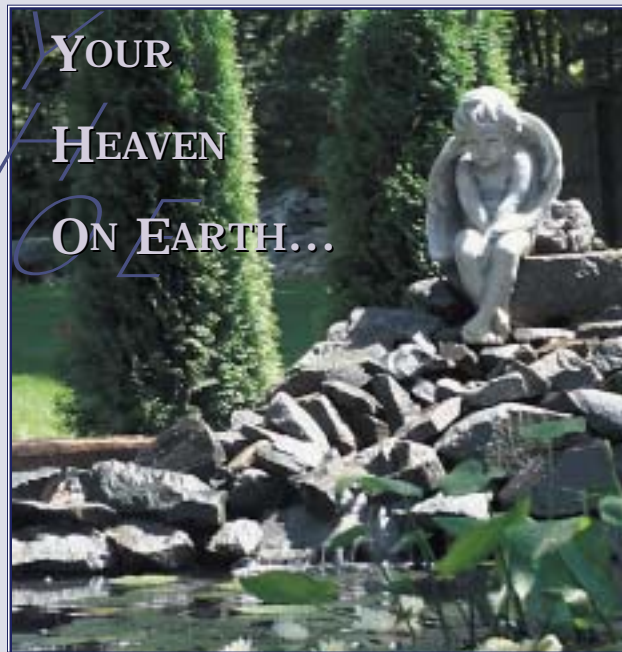
Post Office of Origination: Zionsville, Indiana 46077.

Postmaster: Send address changes to *Pond & Garden*, 1670 S 900 E, Zionsville, IN 46077.

Subscription Rates: US: one year (6 issues) \$20.00; 2 years (12 issues) \$35.00. Canada and U.K., payable in U.S. funds, base rates plus \$7.00 per year.

Address all correspondence regarding subscriptions, distribution, and editorial matters to:
Pond & Garden, 1670 S 900 E, Zionsville, IN 46077;
phone: 317-769-3278; fax: 317-769-3149.

© 2000 Helen Nash's *Pond & Garden* is published by *Pond & Garden*, Inc. No part of *Pond & Garden* may be reprinted without per-



LILYPONS WATER GARDENS

1-800-723-7667 • WWW.LILYPONS.COM
Call For Your **FREE** Catalog Today!



GOLDFISH KEEPING

Water Temperature and Feeding

Feeding goldfish in an outdoor pond is different from feeding aquarium-kept fish. While flake foods are traditionally fed indoors, these foods do not float. In the garden pond, excesses of these foods drift to the pond bottom where they can foul the water. It is difficult to monitor the quantity eaten under these conditions. Select a floating pellet that is specially formulated for goldfish. Feed only what your fish will eat in five minutes, netting out any excess. Fish will overeat, a gluttonous condition not good for their health!

Because goldfish do not have true stomachs, their food is digested directly in the intestinal tract. Therefore, water temperature is very important in their feeding routine. In early spring and late autumn, monitor the pond's temperature so that you do not feed at temperatures below fifty-five degrees. Even at temperatures ranging from 55 to 60 degrees, you'll want to be kind to their sluggish digestive tracts. Feed high carbohydrate foods during these periods. Specially formulated pellets based on wheat germ are a convenient option during these times. Soaking the pellets for five minutes before feeding aids proper digestion since the food remains longer in the digestive tract and swells, absorbing moisture from within the fish. Dry pellets that absorb moisture can block the intestines, invite bacteria and rotting, and result in illness or death of the fish. You can also feed soaked Cheerios or well-cooked peas. During these cooler temperatures, you should also feed



your fish only once a day and early in the day so that food can be digested before nightfall when water temperatures (and fish's metabolism) drop even lower.

In water temperatures stabilized over sixty degrees, feed high protein foods that enhance the fish's growth and energy. Again, feed only what the fish will eat in five minutes. Many fish keepers recommend that dry pellets be soaked even in the summer for easier digestion. You can supplement the dry food with chopped earthworms, daphnia (*see May/June 2000 issue*), or treats selected from the following household foods: thawed/frozen or canned clams, mussels, shrimp, fish, lobster, crabmeat, oysters, beans, peas, raw ground beef, spinach, lettuce, and cooked potatoes, beans, peas, egg yolks, broccoli, cauliflower, and breadcrumbs. Do not feed spiced foods. Any table food treats offered should be plain and chopped up.

Shallow ponds, above-ground ponds, and ponds in hot climates should be monitored for temperatures over 85 degrees. Tie a string around a submersible thermometer so that you can read the temperature from a 1/3 depth. Warm water holds less oxygen than cooler water, and fish require more oxygen for digestion. When the water temperatures go over 85, you should not feed your goldfish at all. Chances are, you'll be adding more aeration during these periods, too. If the water temperature exceeds ninety, a partial water exchange may be necessary to cool the pond. ♡

Practical Ponding Tips

Club members share their ponding tips.

Instead of gravel topping on your aquatic plants, use lava rock. Koi don't seem to like rooting around in the coarser lava rock.

*Randel Patterson, Circle City Aquarium Club,
Indianapolis, Indiana*

What to do with the extra duckweed you have to net off the pond? Stick it in freezer bags and freeze it. It will stay nice and green and made a tasty treat for your aquarium fish or indoor pond fish during the winter. Fish do like their salads!

*Hedy Padgett, Circle City Aquarium Club,
Indianapolis, Indiana*

Are you growing aquatic plants in some of the new, lighter-weight, synthetic media? Have you noticed your plants losing the vibrancy of their green, even displaying yellow between the leaf's veins? The condition can be fatal as your plants are trying to tell you they are starving. Feeding the plants on a regular monthly schedule may not be enough. It may even be necessary, in the case of lotuses, for example, to feed weekly.

*Linda Siler, Springfield Water Garden Society,
Springfield, Missouri*

Want a sure-fire way to kill aphids in your pond? Start with a Windex size spray bottle. Mix some tobacco juice (two pinches of tobacco in a pint of water) and let it stand overnight. Use a plastic container with a hole in the lid as the mixture expands. Recipe: 2 T tobacco juice, 2 T Listerine mouth wash, 1 t liquid dishwashing soap, water to fill the spray bottle. Add the soap last because it suds up to make adding water difficult. This is safe to use on your plants while they are in the pond, in spite of the fact noted by son, Chuck Rush, that nicotine is toxic to fish. Apparently there's just enough to do in the aphids and not enough to affect the fish, since Mom has been using the remedy for years.

*Shirley Rush, (mother of Chuck) Green Country Water
Garden Society, Tulsa, Oklahoma*

SEASONAL PONDKEEPING

by Scott Bates

Summer Time!

Summer is the highlight of the water garden season. Our fish are happily displaying their appetites several times a day. The young fish from spring spawnings are now clearly visible. This is a good time to do a 'nose-count' to be sure your fish-loading is not exceeding your pond's limits. There's still time this summer to dig another pond if necessary! In the meantime, be frugal and feed your smaller fish the fines from the bottom of the feedbag.

Hardy water lilies are at their best in the heat, except for a few of the reds that may 'burnout' temporarily. The time for dividing aquatic plants successfully is coming to an end. They need time to heal over the wounds that occur during division before they enter winter dormancy. In colder climates September may be too late.

Ponds are often overrun with water hyacinths and water lettuce this time of year. After you have filled every birdbath in the neighborhood with these tropical plants, toss the rest on the compost pile. Most of the submerged plants have reached the surface and are just begging for a quick trim. Excess cuttings also make good fodder for composting.

Lotuses are in their prime. Continue fertilizing them through August in colder climates and through September in the warmer climates. Remember that lotuses bloom best in temperatures ranging from 75 to 90 degrees. In temperatures over 90 degrees, they are likely to sulk



until the temperature drops back into range.

Biological filters may need a little attention. The keyword here is

little. Many first time pond owners unknowingly clean their bio-filters to the point of killing or removing all of the beneficial bacteria. Shortly following the over-cleaning comes the pea soup algae. Clean it when you *need* to, not when you *want* to. Do not use chlorinated water to rinse the media – it will kill the beneficial bacteria. Add nitrifying bacteria and an activator once a week to enhance water quality and clarity, as well as to reduce the amount of sediment in the water. Sediment build up is common in the late summer. Monitor the filter for proper operation and perform weekly water tests for ammonia and nitrite to be sure it is doing its job.

This time of year, it is very important to run pumps continuously. While aquatic plants add oxygen during the sunny part of the day, at night they remove oxygen from the water. If your fish are at the surface and are not interested in food, they are starved for oxygen, a life-threatening condition. Water temperature also affects how much dissolved oxygen is in the water. Monitor the water's temperature during hot spells. 85 is the magic number. At temperatures above 85, do not feed your fish as they use even more oxygen in digestion. If the hot spell continues for more than a couple days, you may want to exchange 5 to 25 percent of the water to cool it down. Again count noses...too many fish and too little oxygen is a deadly combination. Where is that shovel anyway?👉

Scott Bates and parents, Gary and Rosemary, own Grass Roots Nursery in New Boston, Michigan.

Garden Adventures

by Joe Summers, Missouri Botanical Garden

Typically once a year I ponder the presence of the art in my garden. This process usually takes place in the spring when I pull all the items out of storage. That is not always the case; my evaluation can and does take place at any time of the year. The question I often try to answer is whether I have too much. An answer never really presents itself. Instead, in most years, one, two or even 6 new pieces of art are added. Just today my daughter Lillian added what has to be the 15th frog near the pond at our home. Just as your garden design is up to your



Three Sturgeons by Siro Tofanari

judgment, so is the amount and quality of the art within your garden.

All gardeners have their personal opinions as to quality standards for art in their yards, too. You may call a piece “art” and your neighbor will call the same piece “junk.” For every person who loves a pink plastic flamingo, there is a person who cannot believe it’s in the garden. You can create or buy your art made of wood, metal, glass, concrete or plastic. In the last few years I have noticed many a charming frog made out of hard resin. This substance holds up to the St. Louis weather and can be quite handsome and light-weight. The bottom line, if you find it inspirational, relaxing or just whimsical, then it deserves a place in your garden. Art, sculpture, statuary or lawn ornaments, no matter what you call them, add a little something to finish your garden... at least until you buy that next piece.

For the ultimate ‘art in the garden’ experience, visit the Missouri Botanical Garden. As a public garden, the MBG displays not only magnificent gardens and rare collections of botanical, horticultural significance, but it also offers a most impressive sculpture collection for its patrons’ enjoyment. The Garden’s collection



Zerogee sculpture (1983) by Paul Granlund.

began in 1883 with the dedication of a marble bust of Carl Linnaeus, who created the modern method of plant names which is used all over the world today. Howard S. Kretschmar was commissioned by Henry Shaw, the Garden’s founder, to create the bust to honor Linnaeus.

Henry Shaw also commissioned “Juno,” the image of the legendary protectress of marriage, as well as “Victory of Science over Ignorance.” Shaw’s final commission was “Henry Shaw” which is found in Shaw’s Mausoleum. Each of these works can still be viewed upon a visit to the Garden or at www.mobot.org.

Today, the Garden displays some of the most distinct examples of garden sculpture in the country. Modern and traditional art philosophies are represented. Sculpture has become a delightful discovery in pathside recesses, water basins or in open spaces with over 35 compositions represented throughout the 79 acres. Pieces owned by the Garden are the gifts of generous friends who have either donated the art or the funds for purchases. A few works are generously made available on extended loan. While these garden sculptures were created to complement plant materials, the Garden’s Horticulture staff artfully selects plant material to likewise enhance the sculptures, presenting an aesthetic balance and unique garden experience for MBG visitors. ♡

Joe Summers is a Horticulturist with Missouri Botanical Garden. Additionally Joe is on staff at Plants, Ponds & More in Affton, Missouri. Currently he is president of the St. Louis Water Gardening Society.



Cora (1993) by Don F. Wiegand in Heckman Rock Garden

Dr. Erik Johnson's 24-hour koi health super site

“Among the first things you should do when setting up a Koi pond, or whenever a fish ever seems ‘sick’ to you, is a test for ammonia.”

Ammonia is the primary waste product of a fish, excreted primarily through the gill tissues and to a lesser extent via the kidney. Ammonia can also accumulate from the decay of fish tissue and other organic debris derived from protein. Ammonia accumulations cause reddened skin and disability of the gills by its direct caustic effect on these surfaces. Fish suffering with high ammonia accumulations will isolate themselves, lie on the bottom, clamp their fins and secrete excess slime, and are much more susceptible to parasitic and bacterial infections.

Ammonia is a big problem in new systems because the bacteria that would naturally process the ammonia are not established. (See *discussion of cycle on the website.*) As well, even in established systems, ammonia may accumulate in springtime when the water is cold but fish are eating, because the bacteria have not emerged usefully from hibernation.

Ammonia is capable of ionization below pH 7.4 and so in its ionized state (Ammonium) is less toxic to fish. Above pH 8.0 most ammonia is NOT ionized, and so becomes more toxic. Care should be taken not to increase the pH of a system if ammonia is present.... providing oxygenation to tanks of fish to keep pH down is an overrated aberration in the literature.

Treatment: Water changes and management



of the pH near neutral will go a long way in avoiding losses from ammonia. Ancillary, less useful modes of ammonia management include the various water conditioners that bind ammonia, and the application of rechargeable zeolite in the system filter. I am still going to tell you that time and water changes are the two most desirable treatments.

Caution: Chloramines are increasingly prevalent in public water supplies. (*Ammonia is added to the water to bond with the chlorine gas and make it longer-lived. Your tap water may actually test positive for the presence of ammonia.*) When you dechlorinate, toxic levels of ammonia can be left behind if chloramines are in use. Ask your local water authority if there are chloramines in your municipal water. ☺

Visit Doc Johnson and his sidekick, Roark, at www.koivet.com for comprehensive Koi and goldfish keeping information. Also, check out Doc Johnson's book, *Koi Health and Disease, Beginner to Advanced Life-Saving Technology.*

Talking About Koi...

While there are domestic Koi, bred and raised in the U.S.; Israeli Koi, most notably of the Mag Noy line; and even German Koi, the heritage of Koi is Japanese. The various colors, patterns, and even sizes are described in the Japanese language. To help you feel more comfortable with these strange terms, in the Japanese language:



Every letter is pronounced.

Nearly all syllables end in vowels, except for an occasional *n*.

The five vowels are pronounced:

- A – ah (a short version of father)
- E – eh (get or let)
- I – ee (machine)
- O – oh (a short version of so)
- U – oo (loose)

Although we Americans do pronounce *R* as *R*, there is no *R* sound in Japanese; it sounds more like *L*. (I recall a correspondence with a Japanese friend who actually spelled the English word *follow* as *forrow*.) There are no diphthongs in Japanese. The *oi* in English is pronounced as *oh-ee* in Japanese.

To get you started talking about your Koi, here are some group names:

- Hikarimono – hee-kah-ree-moh-noh (any metallic fish)
- Hikarimoyo – hee-kah-ree-moh-yoh (patterned metallic)
- Hikarimuji – hee-kah-ree-moo-jee (plain or single color metallic)
- Kawarimono – kah-wah-ree-moh-noh (unusual or different fish)
- Magoi – mah-goh-ee (wild carp, *Cyprinus carpio*)
- Nishikigoi – nee-shee-kee-goh-ee (color variants of wild carp)
- Ogon – oh-goh-n (gold, often used to mean *metallic*)

When Summer Ends...

SAVING SUMMER-FLOWERING BULBS

by Sally Ferguson

A tub of Asiatic lilies next to your backyard pond can be kept in tact and stored in the garage through the winter.

Semi-tropical natives such as dahlias, gladioli, begonias, canna, caladium, elephant ears, oxalis, and other tender, summer-flowering bulbs will not make it through the winter outside of the warmest climate zones.

Tender bulbs can be either treated as annuals and composted or tossed out, or they can be lifted and stored. This depends solely on your preference. Some gardeners can't be bothered, and some bulbs are inexpensive. Other gardeners love to baby their bulbs and tuck them away for the winter.

Keeping your bulbs from year to year

Tender summer bulbs should be left in the ground until frost blackens the foliage. (This is true for all except tuberous begonias, which should be dealt with before frost.)

Dig up the bulbs, being careful not to damage them. Cut off excess foliage and brush off loose soil. Set the bulbs out in a warm, dry place with good air circulation to dry for a day or two. When dry, brush off remaining soil, being careful not to bruise the bulbs as even minor injuries promote mold.

After the bulbs are dry, cut off any remaining foliage and pack the bulbs in a few layers of an appropriate medium such as perlite, vermiculite, cocoa hulls, clean sawdust or peat moss. (Note that living sphagnum moss is a natural deterrent to molds.)



Photo courtesy of Anthony Tesselaar International

Store in a container, with layers of bulbs separated by your medium of choice in a dry place until spring. Optimal storage temperatures vary for different bulbs, but typically range from just under or over 50 degrees. Don't worry needlessly—few people have temperature-controlled storage areas. Store your bulbs as best you can.

A few notes: Dahlia stems may have water in them. Hang them upside down to drain. When digging gladioli, you'll notice the shriveled old corm accompanied with new corms. Separate the corms to discard the old and store the new. Remember, not all summer-blooming bulbs are tender. Lilies and alliums, for example, are winter hardy. Hardy summer bulbs, like most of their spring-blooming cousins, are perennial performers and can overwinter in the garden. ♡

Bulb Plants IN THE Pond

Canna, calla lilies, and taro are bulbous plants that lend a lush, tropical flair to the water garden. You can lift and store the bulbs as described on page 14, or you can move the pots indoors for the winter. Being tropical plants, they are day-dependent, which means you must supply supplemental light to lengthen their days indoors. You'll also want to withdraw feeding to allow them a brief winter's rest. Return them to the pond once the water has warmed to seventy degrees. ♡



Any canna can be adapted to water culture for the hot summer months.



Black taro provides a spark to the water garden design.

Natural Ponds FOR Wildlife – INITIAL PLANNING

Constructing a wildlife pond is not the same as digging out a fishing pond. Game fish ponds may involve depths of ten feet or more, while a wildlife pond may range only to five feet in depth. A 3.5 to 5.0 depth encourages both aquatic and emergent plant growth, which in turn encourages frequent visits from waterfowl as they feed on aquatic insects, aquatic plants, and seeds. Shallow areas also provide nesting habitat for some fish



Canada geese are very territorial during the breeding season. Do not be surprised if your 'flock' suddenly diminishes to only two in late spring and early summer.

species, such as blue gill and sunfish. Marginal aquatic plants offer cover to waterfowl for nesting and rearing young, and cattails, especially, are favorite feeding and breeding grounds of red-winged blackbirds.

The Howard County Soil & Water Conservation District in Kokomo, Indiana, sug-

gests that 3:1 side slopes make the pond more accessible to wildlife and permit small animals to escape from drowning. Even flatter side slopes encourage a more diverse plant community that promotes a healthy food chain.

Site selection is critical. Unlike selecting a site for a lined water garden in which ground water presence is undesirable (that floating liner!), an earth-bottom wildlife pond is the perfect solution to a wet or boggy site. You'll still want to have your County Extension office or Soil and Water Conservation Department do a soil test to be sure your proposed pond will hold water.

Soil borings are analyzed to determine if enough clay is present to hold water. The soil should contain enough clay to hold together in a ball when compressed in your hand, roughly ten to twenty percent by composition. Sand and shale present in your test borings only hint at the likely leaks to come. Rocky ledges present in the site can inhibit digging as well as cause leakage. You can perform a simple soil test yourself to determine if your proposed site offers any potential worth pursuing. Place a sample of the soil in a glass jar and fill the jar with water. Shake the covered jar and then let it settle for 24 hours. You will notice that the soil particles settle into layers with sand on the bottom, silt in the middle, and clay on top. A clay soil sample will be 40 to 100% clay, with 0 to 40% silt, and 0 to 45% sand. This would make for a good pond. A loamy soil sample, on the other hand, will have only 10 to 30% clay, 25 to 50% silt, and 25 to



On warm spring days, you might find turtles sunning themselves on flat rocks or logs around your wildlife pond.

50% sand. While a pond *might* be constructed in the loamy soil, you'll want to do borings throughout the pond site and perhaps still reinforce the pond bottom with supplemental clay or bentonite.

If your soil does not contain enough clay to effect a pond with a stable water level, you may wish to truck in clay or to use bentonite, a colloidal clay mined in the West and shipped in dry form. In either instance, ensure proper application by checking with your local County Extension Agent or Soil & Conservation Office. These two sources, as well as your state's Department of Natural Resources can make available critical information about your area's watershed area and your land's geology. Often they have information on pond construction, maintenance, and wildlife conservation, too. (They may have a pond design booklet published by the US Department of Agriculture, handbook 590, *Ponds—Planning, Design, Construction*.)

Thorough research and planning before you put in an earth pond ensures success. A good place to start is with Tim Matson's two books: [Earth Ponds](#) and the [Earth Ponds Sourcebook, The Pond Owner's Manual and Resource Guide](#), both published by The Countryman Press in Woodstock, VT. Tim also has a video, *Earth Ponds, Introduction to Pond Design & Construction*, that can be ordered directly from him at 802-333-9019 for \$29.95 + \$3.00 shipping. An excellent source for Northern plant material and natural pond information is Kester's Wildlife Nursery in Omro, Wisconsin. (800-558-8815)☛

Browsing the Web...

These websites are listed in this issue
of Pond & Garden! New entries are starred.

www.agritab.com	www.koigarden.com	*www.ponds4u.com
www.americanwpp.com	www.Koiusa.com	www.pondshop.com/catalog
www.anonbay.com/ane	www.KoiVet.com	www.Ponds2go.com
www.aquababies.com	www.Koivilla.com	www.pondvac.com
www.aquagardens.com	www.lilyblooms.com	www.puddlesn pads.com
www.aqualogicpond.com	www.lilypons.com	www.reedsnweeds.com
www.aqua-mart.com	www.linkny.com/barleystraw	www.reliablegarden.com
www.aquariumpharm.com	*www.lonestarkoi.com	www.RichtersGardens.com
www.aquariumservices.com	www.lotussong.com	www.sequencepumps.com
www.aquatecfountains.com	www.louisianairis.com	www.stokestropicals.com
www.aquaticexotics.com	www.marylandaquatic.com	www.suburbanpond.com
www.atlantakoiclub.com	www.mastersons.net	www.SWGReplicraft.com
www.Avongarden.com	*www.mobot.org	www.tcfb.com/perwatg/
www.AZPonds.com	www.microbelift.com	www.tetra-fish.com
www.barsons.com	www.Mystickoi.com	www.thatpetplace.com
www.BigAlsOnline.com	www.nelsonwatergardens.com	www.Thelandscape.com
www.brassbaron.com	www.netjunction.com/solt	www.thepondexperts.com
www.bzli.com	www.nhg.com	www.ThomCpondpumps.com
www.centerpointpond.com	www.nhwatgardens.com	www.ttpfrog.com
www.cirr.com/-ntwgs	www.oasis-water-gardens.co.uk	www.watgarden.com
www.easyponds.com	www.on-line-mall.com	www.water-gardens.com
www.escortlighting.com	www.paradisewatergardens.com	www.waterponds.com
www.fallingh2o.com	www.patiogardenponds.com	www.Watersedgenursery.com
www.grassrootsnursery.com	www.perfectpond.com	www.webbsonline.com
www.greenvista.com	www.plantdoctors.com	www.wernerspond.com
www.Hardscapematerials.com	www.plantabbsproducts.com	www.paradisewatergardens.com
www.hemphillsonline.com	www.pondandgarden.com	www.wggalore.com
www.hoffmansgardencenter.com	www.pondbloomers.com	www.willowpondaqafarms.com
www.hozelockcyprio.com	*www.PondClub.com	http://sites.netscape.net/ripplefarms/
www.jimswatergardening.com	www.pondfiltration.com	www.yileen.com.cn/english
www.kcnet.com/~wgskc	www.pondpumps.com	
www.anjonproducts.com/pondliners.htm		www.ccsi.com/-sgray/austin.pond.society/apshome.html
www.geocities.com/TheTropics/Shores/8015/index.html		http://members.xoom.com/WacoPonds/index.html

Skydiving Goldfish Survives Ordeal by Fire



A family sitting quietly around the fireside was astonished to see a goldfish plummet down the chimney, bounce off the hot coals and land on the hearth. Maureen Brewin and her daughter, Jenny, were gazing at it in astonishment when the fish flipped its tail. Realizing it was still alive, they fetched a bowl of water and scooped it in.

Originally published in England, this story has been published in the newsletters of the Pikes Peak Water Garden Society and the Kansas Pond Society.

The RSPCA, which was called in to rescue the skydiving fish from the house in Northhampton, said it had probably been snatched by a heron from a nearby garden pond and slipped from the bird's beak as it perched on the chimney pot for its meal.

Mrs. Brewin said the herons regarded her neighbours' garden fish ponds as a handy fast-food outlet. "I think it is amazing that the fish survived. It is a very plucky, lucky little fish. We would love to keep it as a pet, but we haven't got a pond," she said.

The goldfish was later reported to have a few damaged scales and a singed fin, but no visible sign of post-traumatic stress.

David Brown, chief inspector of the RSPCA, who had found the fish a good home, admitted that when Mrs. Brewin telephoned to report what had happened, he thought he was being spun a line. "This is the first time in my career that I had been called out to a fish that had fallen down a chimney," he said. "The fish is remarkably unscathed by its ordeal and has now been adopted by a family in Northhampton who have their own pond. It seems to have settled in very well." ❖

Ask the Plant Man



by Steve Stroupe

Q: Do I have to grow lotus in large pots?

A: Lotus, as a general rule, are large plants, requiring large pots. However, having said that, there are alternatives. First of all, let me define a 'large pot' for you. A 'large lotus pot' should be 30-48 inches in diameter. Some pundits would even call this a pond, but for a full size lotus to perform adequately, you simply need a container of this size. We wholesale lotus in 20-gallon squats (23" x 13"). In aquatic parlance, this is called a liner. Twenty gallons is the minimum size we feel will showcase a lotus at a garden center for a single season.

Some cultivars, such as 'Momo Botan,' will *get by* in a 20-gallon pot as a permanent home, but they will not perform optimally. Also, you should realize lotus pots are not completely filled with dirt, as are most other aquatic plantings. For instance, our 20-gallon pots have only 3" of dirt in them. More is not only unnecessary, but generally hinders division and handling. A 20-gallon pot full of mud would weigh 150 or more pounds.

Let's consider your options: A large pot with only 3-5" of dirt, or a smaller cultivar such as 'Momo Botan' in a 20-gallon container.

So called 'teacup' (miniature) lotus, which, while providing interesting fodder for magazine articles, simply aren't as vigorous or as reliable as their larger brethren.

Burying a large container in the ground or

using a liner to create a lotus 'pot' in the landscape or adjacent to the pond solves the 'large pot' problem while providing an awesome spectacle that wouldn't be practical in most ponds. And remember, only 3-5" of dirt in this as well.

Q: Can I grow my garden cannas in my pond?

A: Most cannas will grow in the water, at least for the warm months. Some cannas sold as 'aquatic cannas' are garden cannas produced by the thousands in Oklahoma, the canna-growing capital of the world. You are simply paying a premium for the knowledge you just acquired for the price of this magazine.

Some cannas, such as Longwood Hybrids and *Canna flaccida*, the latter being the only native U.S. species, are truly aquatic, and are readily available throughout the country. To grow a 'terrestrial' or 'garden' canna in your pond, pot the rhizome in a peat-based mix and grow until the canna has 3-5 leaves and a handful of roots. When your pond is 65 degrees or higher, bare root the division and pot in the standard aquatic manner, i.e., no-hole pot, fertilizer, and submersion of 1-6 inches.

Cannas grown in this manner may be enjoyed in the water garden as a seasonal plant. They will usually die if left submerged in the water, even here in zone 7. *Canna flaccida*, however, will overwinter for us consistently. ♡

Steve Stroupe owns Davis Creek Nursery in McCalla, Alabama, and can be reached at 800-493-8968. He is co-author of Plants for Water Gardens, Sterling Publishing, NY.

Homemade Barrel Filter

by Beau Roye

[Reprinted from the *ClearWater Times*, Newsletter of the Koi and Water Garden Club of North Texas]

Using an old 55-gallon plastic drum with the top cut out, you can make your own gravity flow filter system. Home Depot carries hot water heater overflow pans that work great as a lid for this system (or simply use a trash can from Home Depot – not quite as many gallons though).

Cut a 4" diameter hole in the top of the lid. Cut serrated slots at the bottom of a piece of 4" S + D PVC pipe – this will allow water to flow out the bottom of the pipe – and place the 4" S + D pipe into the barrel.

Cut two additional holes in the barrel:

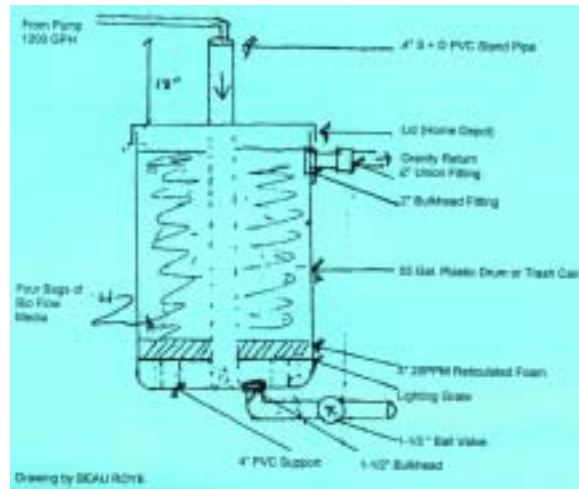
a 1 1/2" hole in the bottom for cleaning and draining, using the correct bulkhead and ball valve; and

a 2" gravity feed return line with a 2" bulkhead fitting and a 2" union fitting, so it can be disconnected for cleaning/draining.

Cut a piece of lighting grate (again, from Home Depot) as a support system/frame for your 20 PPM reticulated foam or filter mat (purchase from a water garden store). This material acts as the first-stage mechanical/bio-filter media. Again, use your 4" S + D PVC for support legs for the grate (approximately 3" long).

Water enters via the top of the 4" PVC, flows down the pipe through the foam and Bio Flow, then is gravity fed back to the pond.

Concrete cinder blocks work well to support the barrel filter off the ground. Paint the entire outside of the barrel black in order to



enhance bio-activity, which takes place in the dark to cultivate.

Materials List:

- 55-gallon plastic barrel
- 110' long 4" S + D PVC
- 1 hot water heater overflow pan, to be used as lid
- 12' x 4' lighting grid material, to be used as support
- 1 foam or pad
- 1 2" bulkhead
- 11 1/2" bulkhead
- 12 union fitting PVC
- 12" male adapter, PVC
- 11 1/2" male adapter, PVC
- 11 1/2" 90-degree PVC
- 11 1/2" ball valve, PVC
- 4 boxes Bio Flow filter media

For more information about the Koi and Water Garden Club of North Texas, contact Theresa Burdette at 972-758-0024 or Jeanne Willingham at jeawill@aol.com.

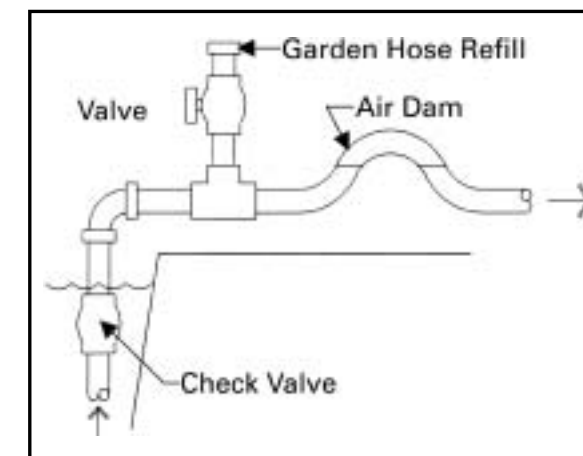
Pond Plumbing Tip

AVOIDING AIR POCKET OBSTRUCTIONS

by Mike Kandt, President, Kansas Pond Society

A member just bought a brand new pump, ran a new water line under the deck, and then just couldn't get it to pump. He checked the check valve. He greased the seals on the prime pot. He primed and primed the line, still with no results. The pump would empty the prime pot, but no water would flow. These are the times that try men's souls. It turns out the problem was an air pocket in the line. While snaking the new pipe under the deck, it developed a high spot. This high spot acted like a reverse trap in the bathroom sink. Water would not flow past this. By installing a tee and valve between the pond and the air dam, he was able to force water through the pipe and eliminate the air pocket. The pump then worked great.

The lesson learned is to run your pipe level or to slope it all one way to drain.



Reprinted from the Kansas Pond Society Newsletter.
Ed. Note: Bob BonGiorno has noted that plumbing lines should be run no higher than the pond's water level to avoid creation of impeding air pockets.

Virtual Village

FOR Pond AND Fish Clubs

AROUND THE WORLD

by Robert Holland

New! PondClub.com

A new, free service from PondClub.com makes it possible for pond clubs and Koi clubs from all over the world to promote themselves and connect with one another on the Internet. This service will also help clubs manage their paperwork and focus more attention on having fun.

The idea for this Virtual Village comes from Barry Picov, founder of Picov's Water Garden Center and Fisheries in Ajax, Ontario, near Toronto. Over the years, Barry has witnessed the growth of pond clubs and Koi clubs, initially in England, and more recently in the U.S. and Canada. Each club has a different personality, he found, but they all have the same mission. They all want to share the joy of ponding with others, and many, if not most, are involved in community outreach activities such as seminars, pond tours and pond projects in public places. "Wouldn't it be great if we could bring all these clubs together," Barry thought, "so they could learn from one another and forge friendships. It would help the clubs grow, attract new people to ponding and expand our industry – a 'win-win for everyone.'"

PondClub.com is the outcome of this dream. While the Web Site is still undergoing



Barry Picov, owner of Picov's Water Garden Center in Ajax, Ontario, operates the largest facility of its kind in North America. Taking the business on-line last year inspired him to pursue the dream of linking pond clubs and pond enthusiasts all around the world

changes and improvements, the Virtual Village is ready to accept new clubs from around the world – without cost or obligation.

The Mid-Michigan Pond Club is the first club to be showcased. You can learn about the club, see photos of their Pond Tours and other activities, including a visit with Pond & Garden editor, Helen Nash, by going to PondClub.com (click on "Featured Pond Club" or "Club Directory") or by going directly to the club's website at PondClub.com/MidMichigan. You can also learn about the club's Pond Tour on July 15th, 2000, by going to PondTours.com, another neighborhood hosted by PondClub.com.

When you visit the club's website, you will see the many free features offered to partici-



the Eastbourne Pond Club in England.

The Lansing

pating clubs, including "Chat Room" with "select audience" choices, "Events Billboard" to promote club events, meetings and activities, "Chat with Helen Nash" at scheduled times, "Club Projects" showcasing community activities, and "Club Forms" to assist with new membership applications, ticket applications for Tours and Seminars, Newsletter publishing, and general record-keeping.

Even more features are coming to add to the value for participating clubs. "We want the Clubs to feel so much at home in our Pond Club Village that they won't want to leave us...even though they are free to do so at any time," says Barry. "This commitment will definitely keep us on our toes," he says, "but that's what we need to do to build the world-wide network."

Other clubs participating in the first phase of the Virtual Village are the Capital Area Koi and Water Gardening Club in Greater Lansing, Michigan, the Water Garden Club of British Columbia in Delta, BC, and

club hosted a Seminar at Michigan State university with guest speaker Helen Nash on March 18, 2000. The Delta British Columbia club participated in the Annual Convention of the Pacific Northwest Koi Club Association (PNKCA) in Richmond, BC, last year. (This year's Convention was hosted by the Washington Koi and Water Garden Society in Lynnwood, Washington.) The Eastbourne Club in England was featured on a national television program in 1997 and is well known for its innovations, including a telephone help line.

The world is full of pond clubs and Koi clubs eager to share their knowledge and enjoyment of ponding with others. PondClub.com wants to bring all these clubs and new pond enthusiasts together. We hope you will join us on PondClub.com. Welcome aboard!☺

Robert Holland is the Chief Net Officer and Club Coordinator of PondClub.com. You can reach him by e-mail at pond-club@mail.com.

ASK CHUCK: PONDKEEPING Q&A

by Chuck Rush



Q: I am going to be building my first pond this summer and have spent hours reading the wealth of information available on the Internet. I am pretty much settled on most of the issues involved, but I have not decided whether or not to put rock inside my pond. Some folks suggest it is a bad idea for numerous reasons, most of which usually pertain to the collection of dirt and other stuff in and under the rock. Others suggest that it is a myth which is almost completely done away with and that adding rock in your pond will not only *not* cause it to be more dirty, but will make it cleaner in light of the beneficial bacteria that will grow on the rock. Some folks also suggest the rock will help protect the liner against UV rays. Please give me your opinion on whether I should put rock in my pond. Also, no one has really talked about this, but what about the potential for puncturing your liner if rocks are inside the pond?

A: Think about it this way...if you put rocks in the pond, all the pond muck that you need to get out of the pond will settle to the bottom *under and among* the rocks. The only way to get that muck out is to remove all the rocks (or use a high pressure hose after fully draining the pond, a costly annual cleaning expense!)

2nd, when you get in the pond to clean it and

take care of your lilies, you'll be grinding those rocks into your liner. Also, trying to walk on loose, slippery rocks can be a treacherous venture.

3rd, if you're thinking that all the rocks will look nice and clean like the rocks in a stream, think again. Those rocks are only kept that way by being constantly washed by lots of water. The ones in your pond will just look like cruddy lumps in a few months.

4th, a good filter will have *tons* more surface area for bacteria than the rocks, and once those rocks get covered up with muck, the aerobic bacteria dies anyway. Then you're left with anaerobic bacteria working down in the muck, producing fish-toxic, foul gases that will make your pond smell badly.

5th, water does a good job of blocking UV. It doesn't travel more than a few inches down. If you use a rubber liner as you should, it's not affected by UV.

Lastly, if you have the proper lily coverage that you need, you won't see the bottom of the pond anyway! Keep the rocks in the garden where they belong. People who want to put rocks in the bottom of your pond are probably selling rocks! :)

Many of Chuck's Q & A appear courtesy of the North Texas Water Garden Society. You can reach Chuck by E-mail at Crush@dallas.net



Victoria Update

by Kit Knotts

Got a Bathtub?

Victoria is no longer just the province of botanical gardens and people nutty enough to build big ponds just for them. Anyone with a pond bigger than a bathtub, or maybe just a big bathtub, can grow them.

Granted, they are magnificent when grown to the huge platters as seen at Longwood Garden, Missouri Botanical Garden, Denver Botanic Garden and the like, but little Victorias are soooooo cute and can be just as rewarding.

Because this was a mild winter for many of us and our starting techniques are getting better, we have been ahead of schedule with our propagation as compared to previous years. We have been playing with ways to slow the plants down (waiting for appropriate dates for setting out in cooler locations than ours). An accidental bonus has been blooming of the plants when they are relatively small.

As always, this is not just us but is a collaboration with Nancy and Trey Styler, Rich Sacher, Joe Summers, Matt Johnson, and recently William Phillips, who has been blooming *amazonica* in his greenhouse over the winter! We compare notes and ideas by phone and E-mail probably more often than is totally sane.

What we think we are learning is that we can really slow growth down by waiting as long as possible to pot the plants into larger containers, fertilizing less, and limiting the plants to two or three pads. Letting the plants become extremely pot-bound leads to decline and death, but

being somewhat pot-bound seems to encourage them to bloom early in their life!

What this means is that almost anyone with a pond can grow *Victoria* if they want to. No longer will you be told you need a huge pond and a crane to put the 200-gallon pot in place! We personally have bloomed them in 10-inch pots (there are reports of plants in four-inch pots blooming!) and have maintained others through a full season in 10-gallon pots. Their spread has been no larger than six square feet.

We currently have a 'Longwood Hybrid' in a two-ounce plastic cup turned on its side stuck in the muck of a little stream. The water depth is less than a foot and the spread available is three feet by four feet. The pads are over two feet, and it is a happy camper! Granted, it can have only two leaves at a time, but it doesn't seem to care.

There are some tricks to growing the plants small successfully. Because the growth of the rhizome is vertical and can rot at the bottom, the plants need to be pushed down into the soil regularly (gloves, heavy gloves!). The object is to keep the new roots produced at the bases of old stems covered, so adding soil around the crown is also needed. Regular fertilizing (weekly, for us) can be adjusted in quantity to the size desired. To keep the spread small, the leaves can be rotated back toward the crown, removing those in the way of new ones.☛

Kit Knotts wrote a comprehensive article on propagating, hybridizing, and growing Victoria in Issue 4 of P & G.

This column continues with her updated observations.

Kit and husband, Ben, garden in Cocoa Beach, Florida.

Pond Splash – PRACTICAL OR FANATICAL?



by Stephen P. Katona

Short, mossy algae is good!

At this time of the year, I hear over and over again the question: How do I keep algae from growing on my pond liner and rocks? My immediate follow-up question: Is the algae short or long?



Short, mossy algae functions as natural or vegetable filtration in the pond to help keep the water clear and free of pea-soup algae.

More often than not the reply is “short algae.” I then ask if the water clear. If the answer is “yes,” I smile and say, “Then your pond’s perfect.”

Confused and unsatisfied, the homeowners explain that they have just drained the pond and scrubbed everything clean. What they don’t realize is that they have started all over from the beginning. Believe it or not, a pond owner’s main goal is to get short algae growing on everything. This tells you that your pond is balanced: wastes

are properly being broken down and plant food (nitrates) are being made. Some of this plant food is used by your decorative water plants. The remaining nutrients are consumed by a short carpet of algae, functioning in the same role as the submerged grasses in the pond. Their removal of excess nutrients from the water prevents the growth of pea-soup algae that detracts from the beauty of your pond. Short, mossy algae is beneficial to the pond. It augments vegetable filtration to keep the pond water clear, and it lends the pond a natural beauty.

We are dealing with a pond... not a swimming pool. Short, mossy algae is practical. So many people become fanatical about the growth and want to clean it away. I recommend procrastination or sheer laziness. Let the pond be. The worst thing to do with an established pond is to drain it completely and start over when it is unnecessary. Let’s think of a mud puddle. The fanatical person keeps cleaning the earth from the bottom. This puddle remains stirred and cloudy. The practical person ignores the turbid water and waits for it to eventually balance and settle out. Nature has a way of becoming self-efficient. Mossy algae growth is part of Nature’s way of balancing the pond. Allowing it to grow and do its job makes for less pond maintenance and more enjoyment of your water garden. ♡

*Steve Katona owns North Hills Water Gardens in Pittsburgh, PA, and can be reached at 412-821-6525. He has also written a manual, *Water Gardening for the Home Owner*.*

Travels with Helen & Marilyn



Wichita, Springfield, and St. Louis....



A special treat in March was a quick trip to Springfield, Missouri, to see the program on bamboo put on by Gordon and Mila Powell for the Springfield Water Garden Society. Besides hooking us on bamboo, Gordon and Mila shared a secret — the..... restaurant in Springfield with the best Japanese food in the U.S.! Mila, who has lived in the Phillipines, introduced us to wondrous foods!



In March, we enjoyed dinner at the annual Wichita Flower and Garden Show's banquet with Show Coordinator Alex Lingg and celebrity Master of Ceremonies, Paul James. Paul is every bit as warm and fun in person as he is on television....and he even has two ponds that he has built himself!



A highlight of our St. Louis trip in May was visiting with Joe Summers and precious daughter, Lily, now ten months old and 18 pounds. Remember her at 5 weeks on the cover of Issue 6, March/April 2000? Lily is seriously considering walking and loves to mimic Grandpa.



On a tour through the Missouri Botanical Garden's greenhouse areas, Joe introduced us to Steve Wolff, who has worked for the Garden for more than 32 years. Steve remembered working with two renown horticulturists, George Pring and Patrick A. Nutt. I could have listened to Steve all day...if the Garden could have spared him!

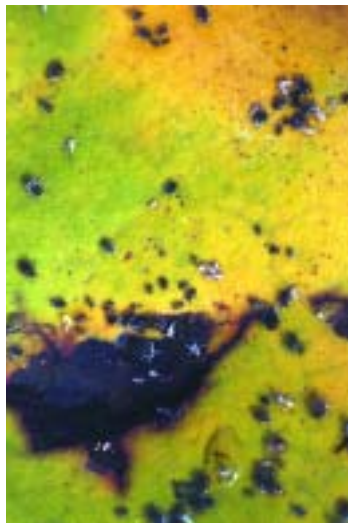
Summer Aquatic Plant Pests

APHIDS AND BEETLES

A water garden is an interactive microcosm of the larger world around it with plants, fish, insects, and microbes all interrelating. The well-tended garden infrequently experiences serious pest problems as prevention and early maintenance keep the problems within an acceptable range.

Aphids

This large group of plant-feeding insects may be terrestrial, but they will still venture into the water garden. Emergent vegetation and floating leaves present a banquet table. Aphids



While Aphids attacking your aquatic plants may be black, white, or green, the result is the same – destruction of the plant.

especially like water lilies, arrowheads (*Sagittaria*), Bog bean (*Menyanthes*), Pickerel rush (*Pontederia*), and water plantain (*Alisma*). Some hobbyists speculate that aphids are attracted to the waning leaves of water lilies as they begin to

yellow, or that aphids target injured plant sites. Keeping damaged and older leaves pruned from the garden may do much to discourage visits from aphids. During the winter, spray any plum

or cherry trees (where the aphids overwinter) with horticultural oil spray to prevent their emergence. Supply your garden with beneficial insects such as ladybugs. For light infestations, make up an oil spray of two parts vegetable oil to eight parts water with a dash of dishwashing detergent for emulsion. Spray the oil on the aphids to suffocate them. If much oil ends up on the surface of your pond water, soak it up with towels or special oil-soaker towels since the oil prevents vital oxygen exchanges into the pond water. A worst-case scenario involves removing affected plants to a separate treatment tank for chemical remedy.

Beetles (Donacia)

Many of the beetles that might plague your water garden are not aquatic insects at all, but



The just-hatched beetle larvae pierce the water lily leaf to feed upon the plant's juices. By the time you notice the stippling produced by this activity, the larvae have usually grown larger and moved on to other plants.



Beetles chew holes in water lily leaves to access the under side where the eggs are laid in rows.

they breed in water and their larvae create the problems. Aquatic larvae feed on underwater parts of floating or emergent vegetation; others inhabit the substrate where they feed upon roots. Air is obtained from the host plant by insertion by the larvae of sharp terminal spurs into the plant tissue. (Those little pinprick holes in your water lilies are evidence of their feeding!) Adults bite holes in the surface of the leaves to access the underside for depositing their cluster of eggs. The larvae are robust and grublike as they mature. Pupation is often around the roots of your plants. Adults overwinter in dead foliage near the water's edge. Preventive measures include clearing dead vegetation from around the pond in the fall, wiping the eggs from the underside of water lily leaves with your thumb or a soft cloth. (Collect and dispose of them to be sure they won't hatch.) Affected leaves should be removed, and visible larvae can be removed by hand, as well. Severe infestations may be treated chemically in a separate treatment tank. ❖

Summer Aquatic Plant Pests

MOTHS AND MIDGES

Moths

With over 50 of the 10,000 species of moths in North America being aquatic, at least in their larvae stage, moths can present problems in the water garden. The 'sandwich man' is probably the most notorious of water garden pests. This moth larvae makes a protective home of floating pieces of leaves and floats around the pond dining at will upon your aquatic plants. Often a small piece of leaf that appears stuck to the top of a water lily leaf will reveal the camouflaged larva working its way to the leaf's petiole where it will travel down the stem to pupate around the lily's rhizome.

Moths display a symbiotic relationship with beetles that chew holes in the surface of water lily leaves. The moth flies by, spies the convenient hole, and pauses to lay eggs in a concentric circle around the hole on the underside of the leaf.

To control moth infestations, remove dry, dead



Some midge larvae tunnel through the upper epidural layer of water lily leaves, leaving rotting tracteries behind. Use a fingernail to flick away the plant cells at the head of the 'tunnel' to see the tiny larva up close.

vegetation from around the pond in the autumn. During the pond season, keep the pond free of floating debris and bits of leaves. Wipe eggs from the

undersides of water lily leaves, collecting and disposing of them. Remove any

affected foliage. Spraying *Bt* is not likely to be effective since the larvae are usually tucked safely away within their 'houses.' Floating mosquito dunks, however, may provide some control.

Midges

In the early evening you might notice what appears to be swarms of gnats or mosquitos hovering over the pond's surface. They are more likely to be midges laying their eggs in the water. The leaf-mining midge (*Cricotopus ornatus*) produces a slender, tiny worm that feeds within a shallow burrow of the plant's surface tissue (like the terrestrial leaf-miners often seen in columbine leaves.) This burrowing produces disfiguring, rotting tracteries in your water lily leaves. Remove affected leaves and dispose of them. Severe infestations may merit chemical treatment in separate treatment tubs. Interestingly, the small red worms often seen in the bio-filter are the larvae of a species of midge. Known as 'bloodworms', these larvae are red for the hemoglobin that stores oxygen within their bodies so that they can feed on detritus in low-oxygen levels of the pond. These larvae do not attack your plants and are, in fact, a delicious treat for your fish. ♡



Moth larvae often conceal themselves within small bits of debris floating in the pond. While they will nibble away at aquatic plants, they make their way to a leaf's petiole where they complete their banquet by working their way down near the rhizome to pupate.

Summer Aquatic Plant Pests

LEAF ROLLERS AND JAPANESE BEETLES

Leaf Rollers

Leaf rollers are usually the larvae of the *Ostrinia (Pyraustinae)* moth. Often called the 'lotus borer', they are most commonly found rolled up in the edges of lotus leaves. They will, however, also attack other large-leaved aquatic



Leaf rollers do just that: roll themselves up within the edge of a leaf and then feed on the plant.

plants, such as *Canna* and *Thalia dealbata*. Because they are wrapped within the leaf, sprays often prove ineffective. Hand

removal is the best remedy. You may wish to remove seriously deformed leaves, if only for aesthetics.

Japanese Beetles

While normally considered a pest of terrestrial plants, Japanese beetles will attack, and quickly devastate, emergent aquatic plants. Pickerel weed, *Pontederia cordata*, seems to be particularly appealing to them, although they will also go after reeds and rushes, too. You may wish to try bug traps, but these voracious feeders may be the one pest that sends you to a treatment tank with insecticides in hand.



Japanese beetles can fully decimate a plant population in short order.

Step BY Step: MAKING AN UPFLOW FILTER

by Jerry O'Quinn

Materials Needed for Apparatus



For Whiskey Barrel Size Container

Use with 1/2 to 1" hose hookup from pump.

- 1/2" OD white PVC pipe cut into lengths of:
 - 3 pieces 9 1/2" long
 - 2 pieces 4" long (to make one side with tee)
 - 1 piece 13 1/2" long (for inflow from pump)
- 5 white PVC elbows with 1/2" ID
- 1 white PVC tee connection with 1/2" ID

For 100-gallon Stock Tank Container

Use with 1 1/2" sump pump hosing from pump.

- 1" OD white PVC pipe cut into lengths of:
 - 2 pieces 16 1/2" long
 - 1 piece 34 1/2" long
 - 1 piece 25" long
 - 1 piece 7 1/2" long (last 2 pieces to make one side with tee)
 - 1 piece 21 1/2" long (for inflow from pump)
 - 1 piece 3" long (for extension on inflow tower)
- 5 white PVC elbows with 1" ID
- 1 white PVC tee with 1" ID

Use CPCV Purple Primer Cleaner if necessary. Each section will be glued with CPVC cement.



Swab glue on the inside of each elbow before inserting its connecting piece. Glue dries in 15 minutes.



For the whiskey barrel size apparatus, connect the two 4" pieces into the tee. For the stock tank container, connect the 25" piece and the 7 1/2" piece into the tee.



Use level ground to ensure the connections into the corner elbows are level.



Anchor the apparatus between your feet to wriggle it into alignment.



Insert inflow tower piece into the tee. Drill holes all around on the top of the apparatus.



Assembly of the Upflow Filter

When you drill the water-return hole from the filter, be sure it is 2 1/2 to 3 times the diameter of the intake coming into the filter from the pump. If you make both the same dimension, the unit will overflow in operation. If your container does not come equipped with a bottom drain, you may wish to install one for ease of cleaning.



Use a drill attachment to make the water-return hole approximately 1 1/2-2 1/2" from the top of the filter container.

Use Outdoor Goop or a similar product to seal the water-return pipe into its hole. Goop should cure for 24 hours before allowing water to flow through.

3. Use clamps to connect tubing from submersed pump to water-intake tower. Fill the container to your desired point below the outlet port with your choice of media –

lava rock, bio-ribbon, bio-balls, etc.

Using a rule-of-thumb of the filter being equal to at least 10% of the pond's volume, a whiskey barrel filter will service up to a 400-gallon pond, and a 100-gallon stock tank will service up to a 1,000-gallon pond.



Jerry O'Quinn owns O'Quinn's Orchids and Water Gardens in Springfield, Missouri.

READERS' Pond Album

A Pond a Year

Del & Beth Wiese, Springfield, MO



Three years ago Del and Beth put in their first pond, a small perform unit holding 125 gallons. A 300 GPH pump recycles the water for their pet goldfish. The balloons are part of this spring's festivities celebrating the Wieses' son Patrick's graduation with a Masters Degree in Social Work from Southwest Missouri State.



This past spring, the pond-bug struck again as Del created yet another pond in their backyard, this one graced by a small fountain. Home to a few small goldfish, the pond will eventually have an in-ground bio-filter added.



Last year Del and Beth took the big step of constructing a 1250-gallon Koi pond as part of their deck. The upper pond is actually the combination bio-filter/vegetable filter for the Koi pond. Emergent aquatics that are safe from inquisitive Koi noses are tucked into the Koi pond along with a spouting sculpture made by friend Skip Drake.



Ponds one (back) and three (foreground) are part of a new annual tradition in the Wiese household – a pond a year!

KOI POND BASICS

Koi are not goldfish. Being a larger fish, Koi have different needs than smaller goldfish that may grow to only 8 or 9 inches. If you want to keep Koi, give them a home that meets their special needs. If you are stocking your first pond, don't fall for the ignorant sales clerk's proclamation – "Oh, you have a pond? You want Koi!"

Minimum Depth: Three feet is a recommended minimum depth. In warm climate zones, anything shallower can result in the pond water heating too much. In cold climate zones, you must also deal with wintering the fish. For your Koi's sake, add another 6 to 12 inches to that three-foot-minimum for every climate zone colder than zone 5.

Maximum Depth: Five feet is generally accepted as the deepest your Koi pond needs to be. Anything deeper and you might not be able to see them enough to enjoy them and to monitor their health!

Minimum Volume: Most Koi folks recommend no less than 1,000 gallons for a Koi pond. Even a 1000-gallon pond seriously limits the



The thin leaves of tropical water lilies do not fare well with koi.

number and size of Koi you can safely keep. A 10x12 area can accommodate a 3500-gallon Koi pond.

Dimensions: Because Koi need maximum swimming room, give them a pond that is longer than it is wide. This will also help you to capture any that you may need to remove from the pond. Avoid complicated designs that present dead areas; you want to provide maximum water circulation. Keep the sidewalls nearly vertical to prevent predators from getting at the fish.

Pond Bottom: Keep it clean. Mulm or silt buildups on a plain liner, or worse yet, hidden within a gravel bottom, provide a home for deadly disease and bacteria, as well as a chemical factory of toxic-gas production. Providing a bottom drain per every ten square feet, tucked into downward slopes or sump areas, keeps bottom sediment moving out of the pond.

Pump & Filtration: Due to the much larger sizes of Koi ponds, submersible pumps of an appropriate size tend to be *much* more expensive to operate. Out-of-pond mag-drive pumps are initially more expensive, but significantly cheaper to operate, besides being more accessi-



Give your Koi the best possible living conditions and they will reward you with years of enjoyment.

ble for maintenance. In the May/June 2000 issue, we printed Doc Johnson's formula for determining your pond's stocking capacity. A very general rule of thumb is one-half inch of Koi per square foot of water surface before bio-filtration is mandated. (This would mean only three 20-inch-long Koi in a 10 x 12 pond! Also, long-finned or butterfly Koi do grow as large as regular Koi.) Suitable bio-filters to consider are bubble-bead or fluid-bed filters and chambered vortex systems.

Koi and Aquatic Plants: Koi will nibble away at tender plants, especially submersed plants and roots from water hyacinths, and uproot the more vigorous plants. The dedicated Koi pond typically does not include aquatic plants. (Most aquatic plants, too, require shallower depths than those provided by the Koi pond.) If you want to include plants, consider a dual-pond system with the plants in their own connecting pond or put your plants in a separate pond stocked with goldfish or baby Koi. It is possible to accommodate hardy water lilies with Koi, but the more fragile leaves of tropical lilies have a difficult time surviving normal Koi behavior.☛



Koi enjoy nuzzling around aquatic plants in search of tasty insects.

DO-IT-YOURSELF Garden Topiary



by Jacque Allsup

Last year, while visiting the Chicago Garden Show, I couldn't help but notice the beautiful topiary display there: full life-size moss structures of men, women, cats, dogs, a giant mushroom, dancing bears, and even a ballerina. Alas, the giant figures came with a giant price tag and were meant for the homes of the rich and famous, neither of which I am.

These topiaries were built on a welded frame base. Another thing I'm not is a welder. That's two strikes against me already. But, where there's a will, there's a way. My Dad taught me I could do anything if I gave it enough thought, so I set my mind to thinking of how to build the framework.

I decided to build a lady for my garden. A few phone calls, a little searching on the Internet, and I found a lady close by who sold old mannequins. Well, even old broken mannequins are worth more than I wanted to pay for them. After all, this was a shoe-string budget. I settled for just the upper portion of the body and arms. A dressmaker's bodice would have worked also, but I liked the thought of preformed arms.

Next, I purchased a Styrofoam wig head. The body came with a clamp to mount it to a pole, so I took an old piece of rebar and pounded it into the ground. I drilled a hole into the top of the figure so the rod would come out the top of the neck about 6 inches or so. On this 6 inches, I stabbed the Styrofoam head. Voilà, my figure was born.

From there, I just started covering everything with chicken wire. An upside down butter dish became the base for the center of her bonnet. After all was covered with the chicken wire, I began stuffing all the holes with large quantities of wet sphagnum moss and wrapped the whole thing with clear fishing line to secure it in place.

I wanted her to have a long dress with a bustle on the back. After I had the dress completed, I added the bustle, which I made as a kind of little pouch that I filled with dirt so I could plant a vine and flowers in it. I hung a basket on her arm, added flowers to her bonnet, and put a couple artificial birds perched on her shoulder and basket.

The end product was affordable, cute, and I did it myself. (And I kept the walkers and joggers in suspense for days.) My mind is already abuss



with what else I can make out there. Maybe a whole family of moss gardeners? There's more to gardening than

just the flowers...I did it, so can you! The old satellite dish? Turn it over — it would make a great giant mushroom. Or maybe a garbage can lid? Oh, more ideas...Isn't it fun?!☘

Jacque gardens in Quasqueton, Iowa. A special thanks to her sister, Rebecca Barber, in Lowell, Arkansas, for telling us about Jacque's creativity! I should add that it's all Jacque's fault. I'm thinking of using rigid plastic mesh (the chicken wire oxidizes in water) over a base form of PVC tubes, sphagnum moss filling, a mister fountain head in the top, and *Lysimachia numularia* 'Aurea' (Yellow creeping Jenny for full-sun planting) to make aquatic topiary statues of my golden retrievers sitting in their own little pond! Of course, they'll each have a yellow tennis ball in their mouths, too!



Foamy Bubbles?

Pond mystery – who dumped soap in the pond?

Water returning into our ponds, especially from waterfalls, generates bubbles. Usually, the bubbles quickly pop and disappear. Sometimes, however, the bubbles remain as a foam floating about on the water's surface. It is unsightly. For the new pondkeeper, it can be a source of concern. An immediate testing of the water reveals no ammonia, no nitrite, low nitrates, and a neutral pH, along with observations of the fish appearing healthy and active. It appears to be merely an unsightly blemish on the pond, but what causes this occasional foam?

The analogy of whipped egg whites holds the answer. Egg white, which contains the protein albumin, will still foam when mixed in water. Fish food formulas include protein, often sourced from water soluble proteins such as found in egg white, milk, blood, and vegetable tissue. Some of these proteins may leach into the water from the food itself, or they may enter the water as undigested wastes



Excess proteins in the water cause frothy bubbles to remain on the water's surface, much like soapsuds.



produced by your fish.

In most cases, the foam production reflects an excess of dissolved protein in the pond water

due to the fish loading of the pond. Your fish may have grown, eating more food and producing more wastes. Sudden temperature changes may disrupt your fish's proper food digestion. Your bio-filter may be taxed by the additional loading, even though it is still doing the job of preventing ammonia and nitrite presences.

The persistent presence of foam on the water would merit a more vigilant ammonia and nitrite testing/monitoring of your pond as the foamy protein is an initial food for bacteria in the Nitrogen Cycle 'food chain.' An immediate bio-solution to the problem is to supply additional bacteria directly to the pond or the bio-filter. You will want to explore adding more bio-filtration or reducing the fish load in the pond.

The dedicated Koi pond offers a built-in mechanical solution to the aesthetics of the problem – an in-pond filter basket set to accept only the very surface water of the pond. These ponds typically do not have aquatic plants that would prevent surface water from directly entering the skimmer. Mechanical solutions, however, do not absolve us of considering fish-loading, feeding regimens, and amount of bio-filtration. ♡

Art in Your Garden LET THE WATER FLOW!

*Photos by Rich Sacher,
American Aquatic Gardens,
New Orleans, Louisiana*

