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August 2016
volume XXIII
number 6

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Series III Vol. XXIII, No. 6 August, 2016

ON THE COVER

Our cover photo subject this month is the killifish *Fundulopanchax sjoestedti*, more popularly known as the blue gularis. It has been our honor and privilege these past nearly three years, presenting Rosario LaCorte's autobiography, **An Aquarist's Journey**. Stunning photos like this have been part of that pleasure.

Photo by Rosario LaCorte

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From the Editor

by Dan Radebaugh

This issue is rather interesting, at least from my point of view. We have by now a very nice assortment of columns, or departments, or whatever you might like to call them, in addition to our featured articles. For years now I've been amazed by how the Undergravel Reporter manages to keep coming up with concise little features to stimulate our imaginations and/or strain our credulity. This month is no exception, and I must admit to being intrigued by the title before I even began to read the piece, having been a fan of Douglas Adams' series of books/TV shows/movies for some years ago now. Nice reference, and very apt.

If anything, I'm even more impressed by the monthly Fin Fun puzzle. I can't imagine being able to come up with something entertaining and challenging month after month. I'm stressed enough trying to come up with something to say in *this* column each month!

In addition to these familiar columns and others, such as everyone's favorite, "Pictures from our Last Meeting," our Facebook Fishy Friends Photo Page has really been a nice addition. Whether we're willing to become Facebook slaves or not, we can still see photos of what our members have in their tanks. Now if only we could get some of these marvelous photographers to add some text to their wonderful photos, and let us read about what they did to achieve these photos, as well as how they care for those gorgeous fish or plants or other animals. We'd like to know! What are the challenges? What are your rewards? There's a saying that "a picture is worth a thousand words," but I promise that I'll accept a lot fewer words than that, so jot down a little bit of what you went through to get to the point of taking these great pictures! Not everyone in the club is on Facebook, but everyone gets a copy of **Modern Aquarium**.

We have *two* articles this month dealing with water. I'd love to say that I planned this, but I didn't—it just sort of worked out. The first of these is by Susan Priest, and is entitled "The Invisible Fishkeepers." It's a reminder to us all that there are things going on in our tanks that we don't necessarily see happening, but that do affect what we *can* see. This article is a very worthwhile reminder that much of what we're looking at in our tanks may not be readily apparent, but needs to be considered.



The other "water" article is a piece that I came across in the Tampa Bay Aquarium Society's **The Filter**. The author is Mike Jacobs, whom I believe I have not met, and his subject is the use of salt in freshwater fishkeeping. When I first became interested in keeping fish, one of the apparent panaceas according to the literature was "the salt treatment." Seemingly this procedure was good for almost everything that might be wrong with your fish. I still keep some calcium chloride on hand, "just in case," though I can't recall ever using salt, either calcium chloride or sodium chloride, for a specific problem and achieving an unequivocally positive result. It remains my "last resort" when nothing else has worked, but it generally doesn't seem to do much. Mr. Jacobs approaches the use of salt from a rather negative point of view, and I think his article provides some useful background information to help us in our decision making.

This month you'll find our 24th installment of Rosario LaCorte's autobiography, **An Aquarist's Journey**. In this chapter Rosario discusses fish nutrition, and you'll see not only more wonderful fish photos (Check out this month's cover photo!), but you'll see some of Rosario's art work as well! This series has been a marvelous addition to our magazine, and we deeply thank Rosario for sharing his story through **Modern Aquarium**!

Our "Do Fish Think?" issue *will* happen next month (September). There is still some time and space available, so if you have an article, or even an observation you'd like to share on the subject, please let me know real soon.

In fact, if you have *any* article, photo, or drawing that you'd like to submit for inclusion in **Modern Aquarium**, it's easy to do! Email it to gcas@earthlink.net, fax it to me at (877) 299-0522, or just hand it to me at a meeting.





GCAS Programs 2016

It is our great fortune to have another admirable cast of speakers who have so graciously accepted our invitation to join us throughout the coming season, bringing us their extensive knowledge and experiences. You certainly won't wish to miss a moment of our prominent guests, not to mention the friends, fish, warmth, and camaraderie that accompanies each meeting.

March 2	Matthew Wickey from Tetra/ Spectrum Brands <i>Fish Nutrition</i>
April 6	Thomas Keegan <i>Ponds</i>
May 4	Tom Allison <i>Zoo Med Laboratories, Inc.</i>
June 1	Rusty Wessel <i>Fishes of the Maya!</i>
July 6	Ruben Lugo <i>My Adventures Keeping and Breeding L-numbers and Other Fish That Suck</i>
August 3	Silent Auction
September 7	Artie Platt <i>From Fish Tank to Fish Room: My Journey</i>
October 5	Mark Duffill (U.K.) <i>Loaches</i>
November 2	Joseph Ferdenzi <i>Killifish Demystified</i>
December 7	Holiday Party!

Articles submitted for consideration in **Modern Aquarium** (ISSN 2150-0940) must be received no later than the 10th day of the month prior to the month of publication. Please email submissions to gcas@earthlink.net, or fax to (877) 299-0522. Copyright 2016 by the Greater City Aquarium Society Inc., a not-for-profit New York State corporation. All rights reserved. Not-for-profit aquarium societies are hereby granted permission to reproduce articles and illustrations from this publication, **unless the article indicates that the copyrights have been retained by the author**, and provided reprints indicate source, and that two copies of the publication are sent to the Exchange Editor of this magazine. For online-only publications, copies may be sent via email to donnste@aol.com. Any other reproduction or commercial use of the material in this publication is prohibited without prior express written permission.

The Greater City Aquarium Society meets every month, except January and February. Members receive notice of meetings in the mail. For more information, contact: Dan Radebaugh (718) 458-8437 or email gcas@earthlink.net. Find out more, see previous issues, or leave us a message at our Internet Home Page: <http://www.greatercity.org> or <http://www.greatercity.com>.

President's Message

by Dan Radebaugh

After not having been to any conventions for several years, Marsha and I have recently attended two—the NEC convention a few months back, and more recently that of the American Cichlid Association. You'll see a brief description of the ACA event in this issue of **Modern Aquarium**. The two organizations are of course different in concept; the NEC is an organization of fish clubs, whereas the ACA is an organization of people interested in a certain type of fish—cichlids in this case. There are of course other, more regional cichlid clubs as well.

Cichlids are not the only type of fish that have special interest clubs built around them. There are national as well as regional clubs for livebearers, killifish, catfish, and, to quote Andy Griffith, "I don't know what-all!" We (Greater City) try to keep our members informed about the dates and locations of these specialty association meetings, but most of them don't as a matter of course send us the info. If I happen to come across it on the web I'll be sure and pass the info along to our Editor for inclusion in **Modern Aquarium**, but mostly that's a matter of luck.

A couple of the organizations I belong to (or once did) aren't very good about sending out membership renewal reminders, and if you don't renew you don't receive information like convention notices. They all now seem to take the stance that if one really wants to know, one will hunt down their website and find out. Then too, many of the websites are quite pretty, but also quite short on actual, up-to-date information.

If any of you are members of one or more such specialty organizations, let me know about your regional or national meetings and I'll be sure Greater City's members are informed. For those of you who not only belong to one or more of these groups, but also go to their convention(s), take (or otherwise bring back) some photos, write up a little commentary on your experience, and we'll be sure our members find out what your 'other' clubs are up to. You might even gain another member or two!

Dan



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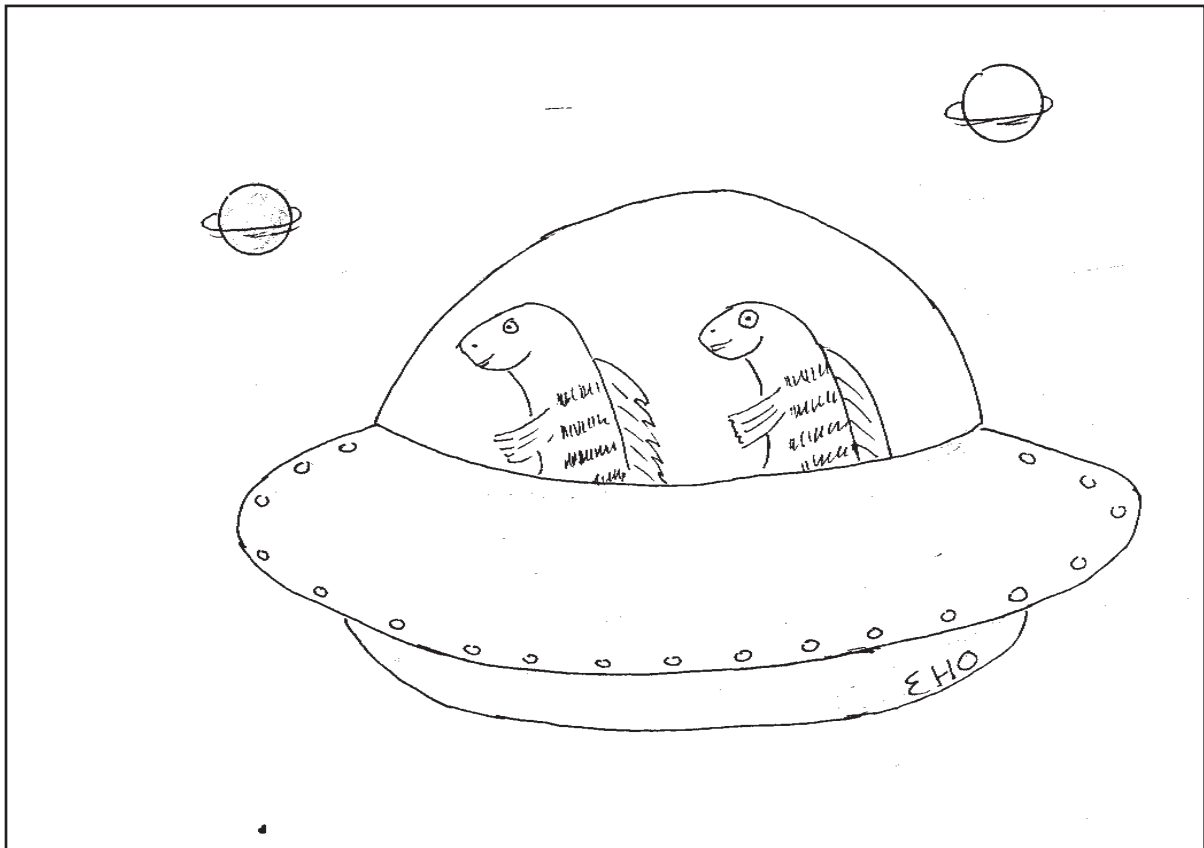
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July's Caption Winner: Denver Lettman



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The Modern Aquarium Cartoon Caption Contest

Modern Aquarium has featured cartoons before. This time though, you, the members of Greater City get to choose the caption! Just think of a good caption, then mail, email, or phone the Editor with your caption (phone: 347-866-1107, fax: 877-299-0522, email: gcas@earthlink.net. Your caption needs to reach the Editor by the third Wednesday of this month. We'll also hand out copies of this page at the meeting, which you can turn in to Marsha before leaving. Winning captions will earn ten points in our Author Awards program, qualifying you for participation in our special "Authors Only" raffle at our Holiday Party and Banquet. Put on your thinking caps!



Your Caption:

Your Name:

Fishy Friends' Photos

by Greater City Aquarium Society Fishy Friends

***B**elow are photo submissions to our “Fishy Friends” Facebook group. I’ve left the subjects unnamed, but not the photographer. If you see a shot you like, and want more info, ask the photographer about it! I’m sure he or she will be delighted to tell you!*

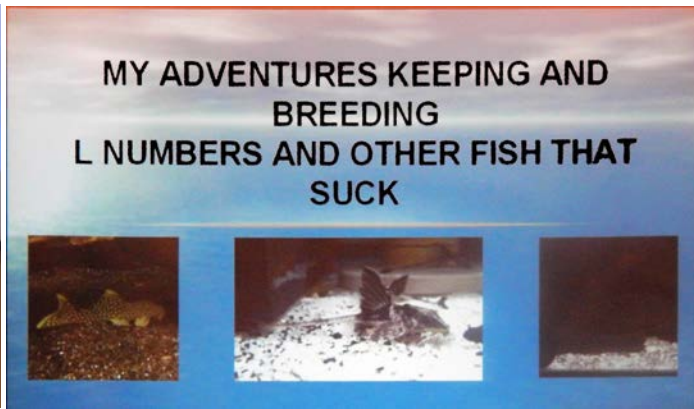


Pictures From Our Last Meeting

Photos by Susan Priest



President Dan Radebaugh (R)
welcomes our speaker,
Ruben Lugo



Ruben's program was indeed an adventure!

Bowl Show Winners:

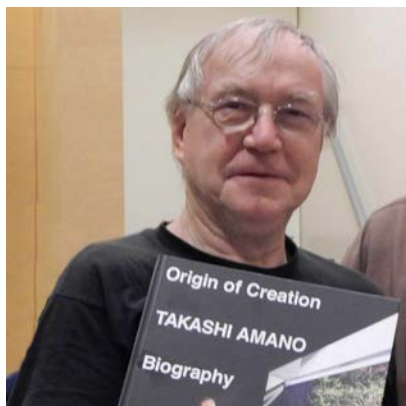


1st & 2nd Place: Mario Bengcion



3rd Place: Summerliya Brewster

Door Prize Winner:



Horst Gerber



Our Auctioneer was working with
his eyes closed!



A Trip to Cincinnati

by Dan Radebaugh

Not having attended any fish events for several years (other than Greater City meetings of course), Marsha and I have now been to two this year: the NEC (documented in the May issue), and most recently the American Cichlid Association convention in Cincinnati (the meeting actually took place across the river in Covington, Kentucky, but why quibble?). Speakers this year included Ad Konings, Greg Steeves, Rusty Wessel, Jeff Cardwell, Vin Kutty, Steve Lundblad, and Wayne Leibel, each of whose programs were thoughtful and well-attended.

We missed the excursion to the Newport Aquarium, but were able to join the trip to the Cincinnati Zoo, which itself featured some aquatic life, including some manatees, which the zoo maintains as part of a manatee conservation program.

We were not the only Greater City members in attendance. The first person we saw as we walked into the hotel was Ed Vukich, who had driven in with Dick Moore. Other members in attendance were the Caputos, of whom you'll read more a little later in this account (hint: see page 13).

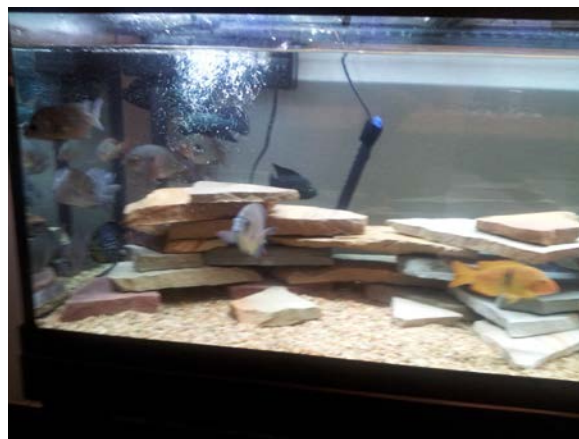
There were many wonderful fish to see and/or purchase, and some of the auction items were just spectacular. An especially unforgettable event was the charity auction presented (!) by the Babes In The Cichlid Hobby.

For those of you with any interest in cichlids, the ACA convention (held annually) is something you really must attend at least once!

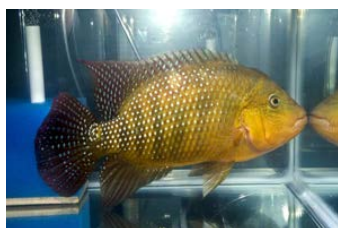
On the following pages you'll see some of the award winners from the bowl show competition. Space doesn't permit showing them all.



Spectrum Fish Foods donated several high-end display tanks for the Silent Auction, such as this 250 gallon cube tank and accessories (the fish were not included). The stand was not as tall as we're used to seeing, and that modest height, plus the square shape, make it a very flexible tank to position, and a great display piece to highlight a room! This tank, listing at over \$7,000 retail, went for *much* less at the silent auction. What a great pickup for the lucky winner! A couple of the other tanks are shown on the following page. Tank photos by Marsha Radebaugh.



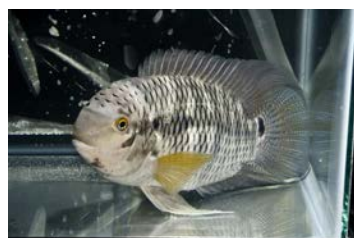
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Mesoheros festae
Scott Myers

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Cichlasoma bimaculatum
Dave Smith

Best of Division B – South America



Aulonocara sp. 'Maleri'
Butch Livingston

Best of Division C – Africa Rift Lake



Pundumilia nyererei
David Hale

Best of Division D – Africa Non-rift Lake, Madagascar and Asia



Electric Blue Acara
Erwin Gundrum

Ornamental Cichlids Reserve Best of Show



Pterophyllum scalare
Isaiah Jenkins

Ornamental Cichlids Best of Show



Pundumilia nyererei
David Hale

C.A.R.E.S. Best of Show



Nicholas Caputo

Best of Art and Photography



Pundumilia nyererei
David Hale

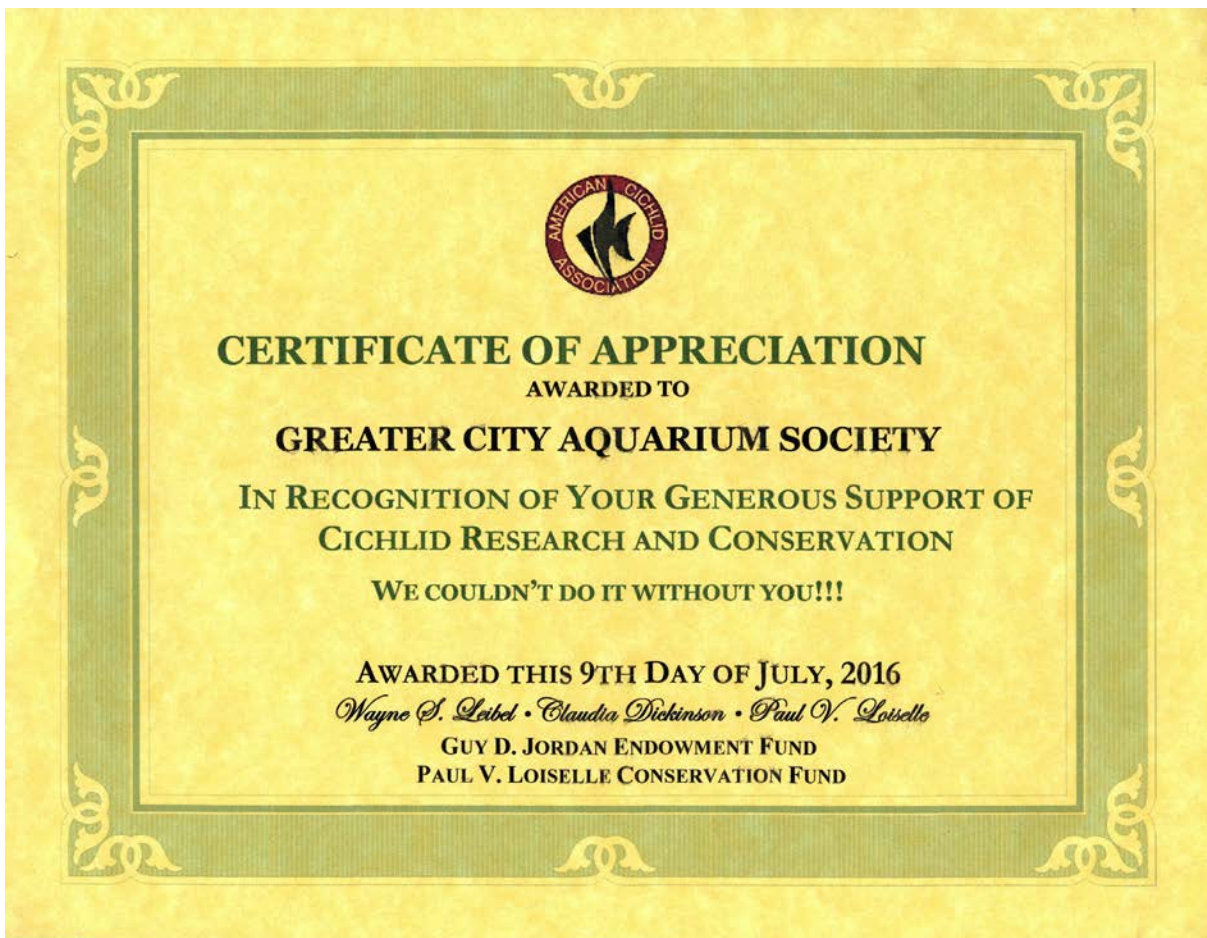
Reserve Best of Show



Mesoheros festae
Scott Myers



Best of Show



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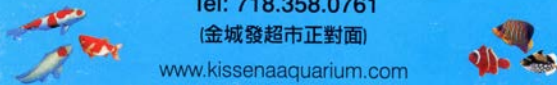
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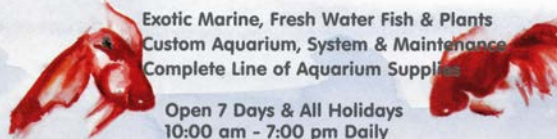


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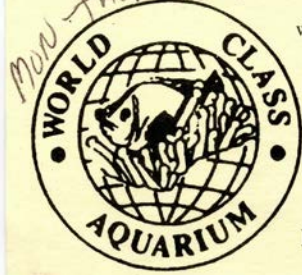


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The Invisible Fishkeepers

by Susan Priest

When was the last time you settled yourself in front of your favorite aquarium and gazed at the watery world within for longer than it takes you to throw some food in as you walk by? Why don't you do it now, and tell me what you see.

Many of you will see an assortment of aquatic plants and some driftwood, a spray bar and a thermometer, and maybe even a mermaid or a treasure chest! Your fishes are even more of a personal choice. The view will be different for each of you, of course. Now stay a little longer, and tell me what you **don't** see. In this article we are going to spend a little time pondering some of the things that are happening in our tanks which are beneficial to our fish and their environment, that we **can't** see.



BENEFICIAL BACTERIA

Nitrifying bacteria control the levels of ammonia, nitrite, and nitrate within an aquarium. All of these chemicals will negatively affect your fish. A newly established tank doesn't have any of these essential bacteria. (There are numerous methods of incorporating them which won't be discussed here.) A mature aquarium environment will have developed a beneficial balance of these bacteria. Over time they will establish themselves on every surface within the tank, including the glass, the substrate, and the filter media. Even though you can't see the bacteria themselves, you will be able to tell that they are hard at work by the absence

of "floaters," by a clarity of the water, and by an overall appearance of well-being among the inhabitants of your aquarium.

TEMPERATURE

There is no way you can tell what the temperature of the water in an aquarium is just by looking at it, but it is probably the most important parameter of this environment. Conventional wisdom on the subject of temperature states that, generally speaking, between 70 and 80 degrees Fahrenheit is considered to be "safe" for most tropical fish. If you are reading **Modern Aquarium**, then you probably know that safe is not always good enough. A little research on the subject of what temperature is optimal for the fish you are keeping will contribute greatly to their well being. Temperatures above 80 can be achieved by using a

heater, but anything below 70 is more difficult. In my house the temperature in the aquariums is always the same as the room temperature, which changes from season to season. So far, so good!

DISSOLVED GASES

The air that us humanoids breathe contains a wide variety of essential gases. The same can be said for water, but there are two gases in particular which a fishkeeper should be mindful of. They are oxygen and carbon dioxide. For the most part they take care of themselves, but a little thoughtfulness on our part won't be wasted. Water absorbs oxygen from its surface, where it makes

contact with the air. Increasing the surface area will aid in oxygenating the water. This can easily be achieved by the presence of filtration, which you will most assuredly have in use. But you need to understand the needs of your fish, so make sure that you do your homework in this area. Some fish, such as surface bubblefish, need still water. In this case, temperature once again becomes an important factor. Always keep in mind that warm water holds less oxygen than cool water, and plan accordingly. Also, the tank should not be overcrowded. Aquariums with a large complement of plants will probably benefit from an infusion of carbon dioxide. If either of these invisible gasses are not present in sufficient amounts, you may see your fish gasping at the surface, or your plants exhibiting varying degrees of distress.

INVISIBLE 'THREAD'

Sometimes you might want to tie a plant to a rock, a coconut shell to a rock, or a rock to a rock. Whenever I want to tie something to something else inside an aquarium, I reach for fishing line. It is sturdy, easy to handle, it won't deteriorate, and once it is under water, it is completely **invisible**!

ALLEOCHEMICALS

Alleochemicals are chemicals that are released by plants. Some of these chemicals affect certain fish, some affect other plants, and some are inert. There is no way of determining which plants release alleochemicals, and what the result will be if they do. The most likely result is a mild toxic effect. For example, if a certain plant is being crowded out by nearby plants of another species, it may emit a chemical which will stunt their growth. Alternatively, alleochemicals can help keep algae under control, and research has shown that they can help protect some fishes from some bacterial diseases. This is highly mystical stuff that Mother Nature hasn't explained to us, so what's a fishkeeper to do? If certain fish or plants are failing to thrive in one of your aquariums, try moving them to a different tank with different tank mates. What you can't see just might be holding them back.

INFUSORIA

Infusoria consist of a variety of microscopic life forms which serve as a first food for newborn fishes. They can be cultured outside of an aquarium, but they are probably present in most tanks, as they will colonize sponge filters and fine-leaved plants such as Java moss or *Riccia*, as well as other coarse surfaces. As long as you are facilitating the growth of infusoria in a tank with fry, it won't matter that **you** can't see them. Think how large something too small for you to see will appear to the fry! Most fry will quickly graduate to live foods you **can** see, such as newly hatched brine shrimp.

Here is a handy tip from Mike Hellweg: If you suddenly discover the arrival of some unanticipated fry, and you are not sure if there is a sufficient crop of infusoria in their tank, the water from a vase of freshly cut flowers (which doesn't have any additives) will provide a hearty supply of microscopic organisms. Just "feed" some of the water from the vase with a baster.

I am not a biologist or a chemist, but merely a humble hobbyist, and I must point out that this article is not a comprehensive assessment of what goes on beneath our visual radar. However, there are two things which I'm hoping you will take away from reading it. The first is that you should bring home a bouquet of fresh flowers every week, which your significant other will surely think is for them. Second, and more importantly, is that when your fishes are watching for you to show up and take care of them, make sure that **you** are not an **invisible fishkeeper**!

REFERENCES

Ecology of the Planted Aquarium, Walstad, Diana. Echinodorus Publishing, 2003.

Culturing Live Foods, Hellweg, Michael R. T.F.H. Publications, 2008.



AN AQUARIST'S JOURNEY

Story, Art and Photos (unless noted) by Rosario LaCorte

Chapter 24

In the spring of 2003 a special weekend anniversary event was planned by That Fish Place, one of the largest pet centers in the United States. Located in Lancaster, Pennsylvania, it carried a large array of live and dry goods, and it was always crowded with both buyers and lookers.

I was invited, along with several other well-known aquarists, to participate in this anniversary celebration. Besides travel expenses and a stipend for our presentations, they would be putting us up at an upscale hotel nearby. It was a very generous package, and I was especially delighted, as it gave Jeannie and me a pleasant getaway that we could share with many friends who would be in attendance.

We arrived on Friday, as our seminars would take place on Saturday. As we checked in at the hotel, we were delighted to learn that Charley Grimes, a longtime friend from Indianapolis, would also be speaking. Charlie is well-known in the hobby, and with his Midwestern twang and great sense of humor, he has been a longtime favorite on the speaker circuit.

On Saturday morning Jeannie, Charlie, and I decided to enjoy a continental breakfast together in the hotel restaurant. There was a nice array of foods on display, including a "make-your-own-waffles" setup. I turned to Jeannie and said that "I'll make the waffles and serve you." She responded, "That's great!", and then I cautioned to Charlie and other nearby diners that "I burn water." That brought a chuckle from Charlie, who then jumped up and said, "Wait! I have to get a picture of this! I'll get my camera and be right back!" As he left, I said to Jeannie, "Those pictures will be on the Internet across the country if I know Charlie." When Charlie returned (with camera) I began to pour the batter into the waffle mold. All went well with the breakfast, and I gave the matter no further thought.

The following week I was scheduled to speak in Atlanta, Georgia. I had not flown to that city before, so I called one of the Society members from the Atlanta organization and was assured that someone would meet me at the airport. The day arrived, and as I was disembarking the aircraft I expected to see someone

with a card held up, saying ROSARIO. Scanning the crowd, I became quite nervous at not seeing anyone. In those days I had no cell phone, nor did I have a number to call. The airport was huge, with thousands of people milling about. Worried now, I followed the crowd toward the exit (I hoped). I walked for several minutes, having no idea where I was going. I finally asked an airport worker for directions. He instructed me to take the tram to Exit 2 and go up the stairs. I followed his instructions, but the tram seemed to be traveling forever. I finally arrived, and bounded up the stairs. Arriving at the upper level I really began

to panic, for now the crowds really were in the thousands, with many signs held aloft, but there was no ROSARIO to be seen. Suddenly I felt a tap on my back, and heard "Hi, Rosario." I breathed a sigh of relief, and turned to see my old friend and fellow invited speaker Gary Lange. The first thing Gary said to me was, "Hey, I saw you making waffles for your wife." I knew

Charlie would distribute those photos far and wide! Shortly after, a few more people told me they had also seen the photos. We all had a chuckle over it.

These weekends of seminars allowed me to make the acquaintance of a couple of speakers that I had not met before, Oliver Lucanus from Canada, and Bob Allen from Salt Lake City. Oliver is well-known for his import/export business, as well as for having collected fish in many parts of the world. We had a nice conversation. Bob Allen is well known in the western states for his work with rift lake cichlids. I asked Bob about his fish house, and he told me that it was quite large, and contained many varieties of cichlids as well as other species. I said, "When you built your fish house I hope you included skylights, as I've always felt light to be very important for fish reproduction." Bob said that he had (as I recall) twelve skylights, but that during the summer months they became a problem, as he was plagued by green water because of the excessive light. I suggested that he put philodendrons in each tank and allow them to prosper. They will root, and improve the quality of the water by removing excess nutrients. He and



Wood carving of *Terranatos dolichopterus*, an annual fish from Venezuela

I exchanged email & telephone numbers so that we could keep in touch. Later that year Bob asked me to speak in Salt Lake City on Saturday, the 10th of October. I accepted, and wheels went in motion to make the flight arrangements. Bob said that I would be staying at his home.

Arriving in Salt Lake City, I found it to be rather chilly, and the surrounding mountains had a coating of snow, creating a very attractive scene for someone like me who lives in the east. Bob picked me up, and drove me directly to his house. His wife Lucette greeted me and made me feel right at home.

As I recall, I brought with me some eggs of a few varieties of fish, as well as several cuttings of philodendron. I suggested that he spread them beneath his skylights and allow root formation to take place. During one of our phone conversations the following year he remarked that the philodendron cuttings had prospered, and he now had the plants growing in many of his tanks, with the result that the green water problem in the tanks below the skylights was now resolved.

Once I settled myself in Bob's home he suggested we visit one of his friends, a professional breeder of rift lake cichlids. Arriving at his friend's establishment, aptly called Crystal Springs, a large Quonset hut was in view. Behind the building there was a large lake, with a dock and an active motor driven pump. The vapor arising from the surface of the lake indicated that it

was thermally heated. Entering the establishment, we saw a large array of in-ground pools, as well as some large cylindrical pools, all the water being recirculated by the outside pumps. It was a really nice setup. No filters or air pumps were needed, as the circulation of the thermally heated water was sufficient to provide a constant supply of clean, oxygenated water. The entire premises were covered with plastic, so that the interior was bathed in natural light. The colors of the cichlids were intense, especially the blue-colored species, which were just dazzling. This was in November, and rather chilly, but the water temperature remained a steady 75°. A number of western states are situated on a very active belt of thermal activity. This wonder of our planet allows some of the people in these states to take advantage of the hot water that can be piped into their homes for heating.

The following day Bob and I, along with several club members, drove out to the lake to collect live shrimp and cysts. I seem to recall Bob telling me that individuals can apply for a permit costing \$25 which will allow you to collect both adult shrimp and cysts. The lake is controlled by the Utah Division of Wildlife. The creation of this department was an excellent move by the state, as without controls the harvesting of the shrimp and cysts could become disastrous, and the effects would likely spill over into other types of wildlife. In addition to the brine shrimp and a few forms of algae, there are a tremendous number of brine flies. They can occur in the billions, much as I mentioned in a previous chapter dealing with the Great Rift Valley in Africa. Approximately 257 varieties of birds depend on the lake for their survival. Many migratory birds stop at the lake to feed on the brine flies. Often you can see an occasional fly larva mixed in with frozen adult Artemia. The same thing occurs in the San Francisco salt ponds in California. I collected there a few years prior to this story, and you can see the brine flies feeding on the carcasses of brine shrimp which have been blown ashore by the wind and perished.



Philodendron showing growth in watery state as well as the extensive root structure. The roots help maintain water quality by removing nitrates



5 gallon buckets filled with artemia cysts



The author standing on brine shrimp (*artemia*) collecting boat in San Francisco salt ponds. The boom in the front section is wide at the mouth to allow the ribbons of shrimp to funnel into a small opening in the rear section, where workers with nets can capture the shrimp and place them in buckets to be frozen into packages.

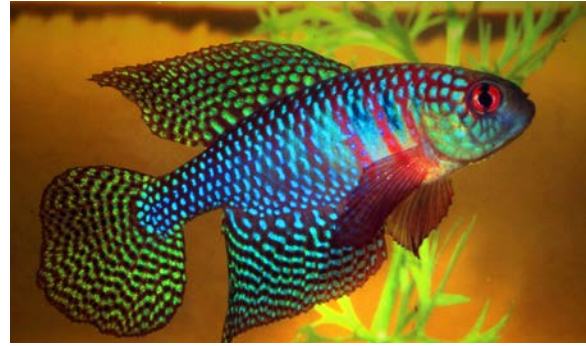
The Great Salt Lake is 75 miles long and 40 miles wide. The harvesting of cysts takes place from October 1 to January 31. Harvesting on the lake is carefully controlled. 21 cysts per liter must be in solution; once the number drops below that all collection is halted. The number 21 assures that there will be enough shrimp to repopulate the lake. Spotter aircraft are used to search for the ribbons of shrimp. Once spotted, the location is given, and harvesting craft with the aid of GPS travel to the abundant area to collect.

In the early 1950s there was an annual trade show at the Hotel New Yorker. I once saw Cleon Sanders, the gentleman who began the industry. His presentation, quite an eye-opener for those of us who didn't know much about the salt lake, consisted of a slide program on the collecting, preparation, and packaging of brine shrimp cysts. I still remember one slide showing an aerial view of a ribbon of shrimp five miles long and a mile wide.

Years ago, in Ursino Lake in Elizabeth, New Jersey, we would see a similar gathering of daphnia. Large swaths of daphnia accumulate downwind, and nets would bulge with the enormous quantities of daphnia.

Today the cost is much higher than in those earlier times. In the 1950s and even in the 60s we could purchase a 1-gallon can of cysts for \$10. Today a quart can vary in price depending on quality and "hatchability" rating. Our domestic aquarium industry also is heavily affected by the Asian prawn industry. Juvenile prawns require the newly hatched shrimp as "first food." This is a worldwide industry, and the United States is the largest consumer of these popular shrimp, which are on the menu in restaurants throughout the nation. The companies packaging Artemia cysts now realize annual sales of 57 million dollars. So the cost for a better grade of cysts is now about \$45 per quart. Had the prawn industry not discovered the value of feeding brine shrimp, I'm certain that aquarists wouldn't have had our costs rise so steeply.

When Bob Allen and a small group of members from the Salt Lake City Aquarium Society approached



***Simpsonichthys carlettoi*.** This specimen was so impressive that it was used as the model for the scientific description by the Brazilian ichthyologist Wilson Costa, and by Dalton Nielsen, another Brazilian, who featured it on the cover of his book *Simpsonichthys & Nematolebias*.

the shore of the lake I couldn't help but notice how desolate the area was. There were few plants, though I'm sure plant life would make a better showing when some rain fell. A small herd of pronghorns was standing on a higher elevation of rocks. This is a practice they use to keep watch for potential enemies.

When we arrived at the shoreline there was not a brine shrimp to be seen, but moving to another area we found brown-colored cysts windblown at the water's edge as far as the eye could see. Bob and his associates came well prepared, carrying shovels and 15-gallon buckets to gather and contain the cysts. In a matter of an hour or so we were able to fill our buckets, as the photos reveal. That evening Bob set up some hatching jars to see what kind of hatch rate we would get. Over the next few days Bob felt that we would likely get about a 30% hatch rate.

On October 21, 2010 Kevin Newsome and Doug Judd, two members of the Salt Lake City club, visited with me, and we discussed the large collection of cysts we had gathered during my visit there. They told me that the cysts had turned out to be very high quality, with excellent hatch rates.

For more than 50 years I have expounded on the word 'chitin' and its importance to the nutritional needs of fish. However, many hobbyists may have never heard of the word. With my deep interest in fish nutrition, I have obtained wonderful results by



Unidentified tank-bred species of *Pyrrhulina* showing outstanding fin development due to proper nutrition

Modern Aquarium - Greater City A.S (NY)



Daffodil *Neolamprologus* showing beautiful color and finnage

August 2016



Phenacogrammus interruptus, the Congo tetra, showing magnificent finnage and color



Fundulopanchax sjostedti, the blue gularis



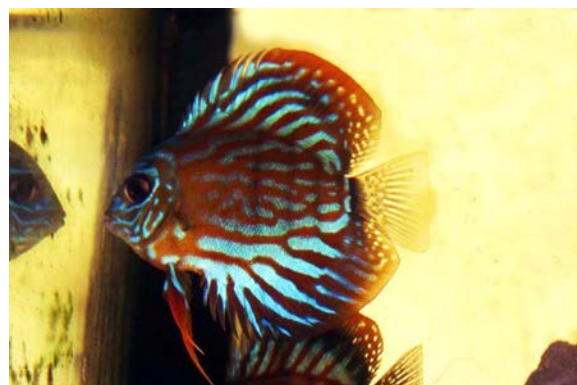
Alestopetersius nigropterus. The author was very successful in rearing many of these beautiful Congo species.



Corydoras red which I maintained for 14 years, losing them after Hurricane Sandy.



Mother and young -- Royal Blue discus taken in 1970

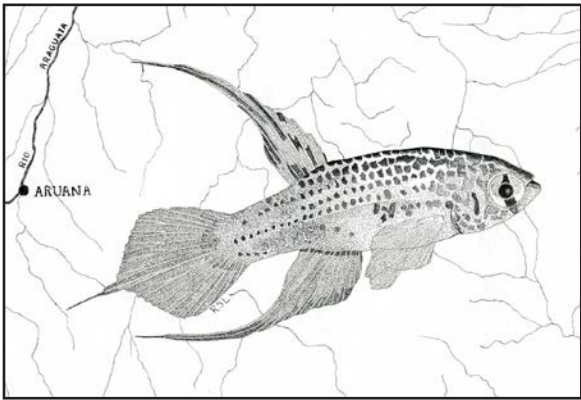


Offspring of Royal Blue 1970. Notice bold stripes and extended dorsal and anal fins due to nutrition which I outline in this chapter.

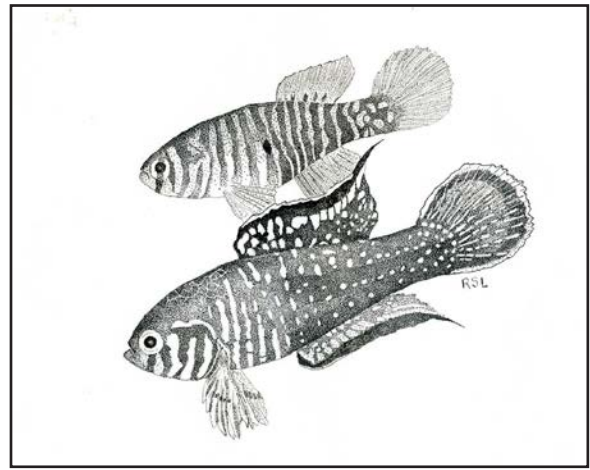
using the feeding methods I have designed. The fishes I've worked with have always had exceptional color and finnage. That has not been accidental. Chitin is found in many living things, especially in arthropods and crustaceans. The diets I've used have included daphnia, Artemia, cyclops, saltwater prawns, mysis shrimp, krill, and so on. All of these are a rich source of chitin and carotenoids. In the wild, fish diets include insects that fall into the water or live in the water. The exoskeletons of these insects are also a good source of chitin. In an earlier chapter I mentioned that Gary Jones, Corporate Scientific Affairs Manager at Mars Fish Care (formerly Aquarium Pharmaceuticals) once invited me to tour their facility. While there I met a gentleman named Mike, who was in charge of Research & Development. After our introduction,

Mike reminded me that we had met several years earlier, when I had given a presentation to the Bucks County Aquarium Society in Pennsylvania. He went on to tell me that I was correct in my assertion of the importance of chitin in the formation of fish finnage. He had applied the ideas I had spoken about in a special blend for goldfish, and the results were exactly as I had stated.

In this chapter I have included some photos of fish with exceptional finnage. I have searched many aquaculture sites online in the hopes of finding someone else who expounds the same views of chitin and its effect on fin development. I was able to find one university involved in aquaculture that noted chitin's effectiveness in the repair of damaged fins, but there was no mention of its role in fin development.



Pen and ink of *Maratecoara lacortei*



Simpsonichthys boitonei pen and ink



Distichodus sexfaciatus water color



Australian rainbow water color



Decoupage done 40 years ago. Water color on paper, mounted on pine board that has been struck with an axe to give antique appearance. Afterwards a flame is applied to board and wire-brushed to remove the wood pulp. The drawing is then glued to the board and many coats of clear lacquer are applied to lock the drawing for preservation.



Wood carving *Metynnis fasciatus*



Epoxy cast from my model and used in the foundry to cast



Brass cast of *Nematobrycon palmeri*

Many of the crustaceans that I mentioned above are also rich in carotenoids, resulting from feeding on various forms of algae and other plants.

Notice the discus photos from 1970. The original pair were wild fish, with the trade name Royal Blue Discus. The pair was given to me by Vic Hritz, the owner of Crystal Aquarium, one of the better aquarium shops in New York. At that time royal blue discus were in great demand. Vic imported them from Willi Schwartz, an exporter from Manaus, Brazil. Willi would only send two boxes, each containing a dozen or so adult discus. Vic had them a short time, and they spawned in his show tank. Because they were a wild, breeding pair he decided to pass them on to me. They became prolific breeders, and I was able to supply Vic with young for quite some time, which were extremely colorful, and developed into beautiful adults. You will notice that the parents have a round profile, whereas the offspring are decidedly different in appearance, being more elongate, and extremely colorful compared to their parents. Both of these results are from the rich presence of chitins and carotenoids in their diet.

Krill (mentioned above), from the family Euphasausia, are an excellent food nutritionally, and can also have a positive effect on color. They are readily available in frozen and freeze-dried form. These can be up to an inch or so in length, so you might wonder how they could be fed to fry. The method I use is to first hydrate the freeze-dried krill by soaking them in water. Then place them on a cutting board (which should be kept wet as well) and, using a vegetable cutter, reduce the krill to the smallest size you need. Once you have your desired result, put the krill in a container of water. You can then place the amount you want to feed into a 1 mm net—one step up from a brine shrimp net. The contents of the net are then forced by a hose nozzle with a force spray. This water action will push the smallest particles through the net, giving them the appearance of infusoria. The same procedure can be used with different size mesh, depending on the size of the fry you are feeding.

Again, the effects of this feeding will be two-fold: color and fin development. This method also works especially well when breeding corydoras catfishes. One of the accompanying photos shows an

unidentified catfish from Colombia that I propagated for more than 14 years. For want of a better name I referred to them as red Aenaeus from Colombia. Several types of shrimp, segregated by size, can be beneficially used to feed fry at varying stages of development.

In Chapter 23 I mentioned my interest in sketching. I used pencil as well as pen & ink. During my military service there were times when barracks life could be quite boring. Many times I would make sketches for my companions, which they would often send home to their families. After my discharge I didn't do any art work for more than 50 years. It was in this later stage of my life, after having really immersed myself in the study of fish that I decided to start making pen & ink drawings of fish. In this chapter I've decided to display some of the drawings and wood carvings that I enjoyed doing in my spare time. Even today I would like to do some more art work and carvings, but I just haven't had the intensity at this stage in my life to go in that direction again.

One of my granddaughters is artistic, and when she was in her teens she called me one day, knowing that I had a large selection of society T-shirts from all around the country, depicting a fish that may have been their emblem, and asked if she could have some of them. I let Danielle take whatever she wanted, though I had no idea what her intention was. Several weeks later she opened up a large quilt displaying the T-shirt emblems that she had cut into squares and pieced together in a beautiful display that accompanies this chapter. I must tell you, Jeannie and I were really impressed and proud of what she did. A pillow case was also part of the assemblage. I never used it, because I was too proud of it to want to wear it out.

One of the accompanying carvings shows a black epoxy cast that I made for making a brass piece. I never completed it. I hoped to embed some precious stone in the brass casting to serve as its eye; I just never got around to it. I intended to spray-paint the plaque itself with a flat black background and give the fish section a high-polish finish. Oh, well! Perhaps someday...



Quilt made by Danielle using various Aquarium Society T-Shirts. My daughter Maryann Kendrick, Danielle's mother, took this photo and the one below.



Pillow case made by Danielle using T-Shirt from the Potomac Valley Aquarium Society

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Rules for August's "Silent Auction" / Fleamarket

Next month, Greater City has its annual "Silent Auction"/fleamarket. Here is a brief summary of the rules:

- ★ The seller sets an opening price for each item, which must be at least one dollar.
 - ★ Bidders write down their bids in increments of at least \$1.00 That is, your bid must be at least one dollar more than the previous bid, and **you may only bid in even dollar amounts** (such as \$1.00, \$2.00, \$5.00, etc.) Bids of dollars and cents such as \$1.50, \$2.75 will be invalidated.
 - ★ A bidder may not cross out his/her own bid to enter a lower bid.
 - ★ The highest bidder at the end of the auction wins the item.
 - ★ Proceeds are split 50/50 between the seller and Greater City. (Of course, the seller may also donate 100% of the proceeds to Greater City!)
 - ★ Items not claimed by winning bids (or if there were no bids, by their owners) at the end of the auction become the property of Greater City.
 - ★ Bids entered after the auction has been declared closed will be invalidated. The decision of the Auction Chairperson or President on whether this has happened is final.
-



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Salt/Conductivity and Tropical Fish

by Mike Jacobs

Let's talk SALT. When I say SALT(s), I really mean MINERALS. But SALT (sodium chloride—table salt) is the most common mineral used in the aquarium hobby. You know, trying to debunk an old wives' tale in the aquarium world is like trying to pull hens' teeth. I understand that some people will say that I'm wrong, but please read this with an open mind.

There are basically three places where we can talk salt (minerals): where you buy fish, in your home tanks, and shipping fish. Folks, salt (sodium chloride) has a limited usefulness in the aquarium hobby, and that usefulness is basically limited by the clock. Studies with angelfish have shown that salt did reduce stress at around 1.5 ppt, which is approximately an additional 2,500 microsiemens. However, at around 72 hours things start to happen within the physiology of freshwater fish. Freshwater fish are hyperosmotic, meaning that they have to maintain a HIGHER blood salinity than their surrounding environment. Everything goes along OK for a while with the addition of sodium chloride, but then, when the 72 hour time frame is reached, there is a very substantial rise of CORTISOL in the blood, which is an indicator of stress, and the fish now has some "reckoning" to do with the salt.

First of all, the fish's body is trying to modify its fluids to maintain HIGHER conductivity (salinity) than the surrounding water—**that's what freshwater fish do**. So now they're doubly stressing over being stressed! This study was performed in the 1990s at Auburn University, with over 500 angelfish being used in the study, which was repeated over and over again with the same results.

I know what people say: "The addition of salt to a freshwater tank relieves stress in the fish." I've been hearing that for maybe 60+ years—mostly from dealers and manufacturers (hint, hint).

So let's begin with the first issue, **Where You Buy Fish**. These days there is a good chance that the fish you buy in a "fish store" will be in water having a conductivity reading of between 3000-5000 uS/microsiemens, or maybe even higher, from a conductivity meter. The problem with the fish being in water with a conductivity reading of 3000-5000 uS is that your water, certainly here in the Tampa/St. Pete, Florida area, is maybe in the 500-600 uS range. Fish

have a big time BAD reaction when they suddenly go from high conductivity to much lower conductivity after 72 hours (this is the second stress), and you can bet that those fish have been in that water for days and days at the wholesalers, and at the fish shop for maybe 14-21+ days before you bought them.

Going from a lower conductivity reading to a higher conductivity reading is way, way, way less stressful than the other way (that's for another article; it is a BIG convoluted story)!!! So the fish have

been under stress because they went from a wholesaler to a fish store, and they have been in salt for 3-4 days (remember, only 72 hours allowed), and they are now in a fish store tank in which the conductivity reading is jacked up with something (probably sodium chloride), and along you come and buy the fish. You go home and put them in your tank, which is sitting at the 500-600 uS level, and the fish now

are way over-stressed, and practically doomed to not make it within 4-12 days.

Back you go and ask for your money back! HINT: The next time you go to a fish store, take a conductivity meter and measure the level in a few of their tanks—if they will let you!!!

In your home tanks, should you use the commercial "Stress Stuff" (which has a lot of minerals in it) or straight salt (sodium chloride)? Your choice here, but remember that you will be stressing the fish immediately as they try to make their body fluids achieve a HIGHER salinity than what they are swimming in. Of course if you want to do that, they are your fish. There will be a critical point, at which they will be stressed over and above the initial stressing, but if they make it past that point then you are off and running. Having said that however, I would ask why you would want to put your fish through that double stressing instead of just letting them relax in your tank?

Shipping: Well, usually fish are shipped inside of the 72 hour period, so what people send their fish in is really up to them. Short of maybe preventing disease (usually ich), I have no clue why people would put stuff (minerals, salt, other concoctions) into a bag of fish. Maybe if the fish are from "who-knows-where," and there is a concern for some diseases, then *maybe* some concoction would be called for, but I have shipped fish since about 2000, and never put



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one grain of salt or ANYTHING ELSE in a bag, but they were fish I personally knew to be clean, from my tanks, and I have had a success rate of some 98+%. Such losses as I did have were generally traceable to the Post Office!

The issue of salt (sodium chloride) is very, very complex. It's not just a matter of "salt eases stress." It's really not! But it's also not a subject that can be fully explained in a one-to-three-page article. I have been keeping tropical fish since maybe 1950 or so; I never have used salt, and I never ran into the salt issue until maybe the late 1960s, when I started hearing the "salt story" from a pet shop in my college town. Even since then I have not used it, and will not use it, and if I happen to get fish from someone that I know uses salt I go immediately into "FIX" mode to lower the conductivity of my tank water. This takes days and days—not hours—to be done correctly.

99% of the fish I keep are from water that has never, ever, produced a conductivity reading above 200-300 uS in the wild. I know, I don't have all wild fish, but the angels and the apistos and all the rest have been purchased from people who have conductivity levels very similar to my own.

This "salt thing" (sodium chloride) really bothers me, and I am sincerely trying to help the hobby/hobbyist. It's kind of my own little one-man protest, and I get this urge every two or three years to say something. I think some are listening, but I don't really know.

Folks, salt is an irritant, and it will increase stress in your fish when you use it. That's a biological fact, not just some cock-a-meme thought or story. Forget the salt—just forget it! If you think you have stressed fish in your aquarium, find the cause of the stress and eliminate it. The fish will be fine for a while. Don't add salt to your aquarium and think you are helping your fish. This immediate solution (the salt) is causing the fish even more stress. And then, if the fish live and you decide to eliminate the salt, you are going to cause further stress by not taking days and days to lower the salinity. For sure don't go past the critical 72 hour period if you haven't even found the original cause of the stress!

Please keep the salt out of your bags and your tanks—you will have happier fish. Learn to deal with the hobby without salt. See, I wrote an entire article on SALT and I never once used the word OSMOREGULATION ☺ ☺ !!!

Please read the excellent article linked below. It doesn't explain the entire situation, but it does a pretty good job!



<http://www.advancedaquarist.com/2004/9/fish2>

Photo of saltshaker from Wikipedia, by By Dubravko Sorić.

Meeting Reminders



Almost every month at least one meeting reminder postcard is returned undelivered. Sometimes the member moved and just forgot to update his or her contact information with Greater City. Other times, well it's a mystery—the address was correct, but the Post Office marked it as "undeliverable."

Unlike some aquarium societies, at Greater City there is never a charge for non-members to attend, there is no "bidder card fee" to bid on items in our monthly auctions, the refreshments are free to everyone at the meeting, and anyone can purchase raffle tickets. But membership does have its privileges, including this award winning magazine, door prize chances, the ability to participate in our bowl shows, and advance reminders of our meetings. If you have an e-mail account, please consider getting your meeting reminders by e-mail, instead of by postcard. You will be getting two notices (one a week in advance, the other a day in advance) instead of only one, and the chances of non-delivery are virtually none (unless you change your e-mail address). While it's a very small thing, you'll even help the environment by using less paper. An e-mail sign-up sheet is at the membership/Modern Aquarium table, or send an e-mail to gcas-webmaster@usa.net.



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FREE TO GOOD HOME: I have a Giant Gourami who is now too big for my 80 gallon tank. He needs to be in much larger quarters. He is a beautiful and healthy 5 years old fish (see image). If you have or know anyone who has a big tank and would like to have this adorable fish, please send me an email message. Antonio (dj_neco@yahoo.com).

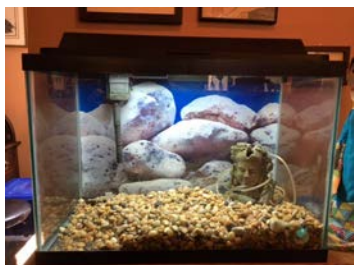


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GCAS Happenings

August

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- | | |
|-----------------------|------------------------|
| 1 MARIO BENGCION | RED DRAGON PEACOCK |
| 2 MARIO BENGCION | ALBINO BLUE-EYED PLECO |
| 3 SUMMERLIYA BREWSTER | BETTA |

UNOFFICIAL 2016 BOWL SHOW TOTALS:

BILL AMELY	16	RICHARD WAIZMAN	15	MARIO BENGCION	8
ED VUKICH	5	SUMMERLIYA BREWSTER	1		

A WARM WELCOME BACK TO RENEWING GCAS MEMBERS FLORENCE GOMES AND BARBARA ROMEO!

Meeting times and locations of some of the aquarium societies in the Metropolitan New York City area:

GREATER CITY AQUARIUM SOCIETY

Next Meeting: September 7, 2016

Speaker: Artie Platt

Topic: *From Fish Tank to Fish Room: My Journey*

Meets: The first Wednesday of the month (except January & February) at 7:30pm:

Queens Botanical Garden

43-50 Main Street - Flushing, NY

Contact: Dan Radebaugh (347) 866-1107

Email: gcas@earthlink.net

Website: <http://www.greatercity.org>

BIG APPLE GUPPY CLUB

Meets: Last Tuesday each month (except Jan, Feb, July, and August) at 7:30-10:00pm.

Alley Pond Environmental Ctr.: 228-06 Northern Blvd.

Contact: Donald Curtin (718) 631-0538

BROOKLYN AQUARIUM SOCIETY

Next Meeting: September 9, 2016

Speaker: Joe Graffagnino

Topic: *Joe's New Fish-Room*

Meets: 2nd Friday of the month (except July and August) at 7:30pm:

NY Aquarium - Education Hall, Brooklyn, NY

Call: BAS Events Hotline: (718) 837-4455

Website: <http://www.brooklynaquariumsociety.org>

LONG ISLAND AQUARIUM SOCIETY

Next Meeting: September 16, 2016

Speaker: TBA

Topic: TBA

Meets: 3rd Fridays (except July and August) 8:00pm.

Room 120 in Endeavor Hall on the State University at Stony Brook Campus, Stony Brook, NY

Email: Margaret Peterson - president@liasonline.org

Website: <http://liasonline.org/>

EAST COAST GUPPY ASSOCIATION

Meets: 2nd Tuesday of each month at 8:00 pm.

Alley Pond Environmental Ctr.: 228-06 Northern Blvd.

Contact: Gene Baudier (631) 345-6399

NASSAU COUNTY AQUARIUM SOCIETY

Next Meeting: September 13, 2016

Speaker: TBA

Topic: TBA

Meets: 2nd Tuesday of the month (except July and August) at 7:30 PM

Molloy College - Kellenberg Hall ~1000 Hempstead Ave - Rockville Centre, NY

Contact: Mike Foran (516) 798-6766

Website: <http://www.ncasweb.org>

NORTH JERSEY AQUARIUM SOCIETY

Next Meeting: September 15, 2016

Speaker: TBA

Topic: TBA

Meets at: Quality Inn, 10 Polito Ave., Lyndhurst NJ

Contact: NJAS Hotline at (732) 332-1392

Email: tcoletti@obius.jnj.com

Website: <http://www.njas.net/>

NORWALK AQUARIUM SOCIETY

Next Meeting: August 18, 2016

Speaker: Dr Paul Loiselle

Topic: TBA

Meets: 8:00 P.M. - 3rd Thursday of each month except for July & December at: Earthplace - the Nature Discovery Center - Westport, CT

Contact: Sal Silvestri

Call our toll free number (866) 219-4NAS

Email: salsilv44@yahoo.com

Website: <http://norwalkas.org/>

“So long, and thanks for all the fish”

- title of a book by Douglas Adams

A series by “The Undergravel Reporter”

In spite of popular demand to the contrary, this humor and information column continues. As usual, it does NOT necessarily represent the opinions of the Editor, or of the Greater City Aquarium Society.

While the lease on its premises expires in less than two years, the early closure is to facilitate the transfer of the animals to their new homes. The attraction's pink dolphins, fur seals and otters have been moved to Chimelong Ocean Kingdom in Zhuhai, China, one of the largest marine parks in the world. As for the rest, a spokesman said: "After the closure, 10 of our staff will stay on to operate and maintain the aquarium's life support system and to care for the animals till suitable homes are found for them."

When Underwater World opened in May 1991, it was the largest tropical fish oceanarium in Asia. Built at a cost of more than \$20 million, it was a big draw for tourists. But in recent years, it faced competition from newer attractions on the



Visitors taking snaps and selfies in the attraction's underwater tunnel. ST PHOTOS: KUA CHEE SIONG

The “Underwater World Singapore” exhibit has closed after 25 years. Thousands of people braved the crowds to take their last selfies and videos with the marine life at the oceanarium.¹ At the touch pools, children and adults alike squeezed their way to the edges for one last chance to stroke the fish, starfishes and stingrays.

References

¹ <http://www.straitstimes.com/singapore/underwater-world-singapore-closes-so-long-and-thanks-for-all-the-fish>

resort island, such as the Marine Life Park and Universal Studios theme park.

Perhaps our aquariums are facing competition of their own from POKEMON-GO!





Fin Fun



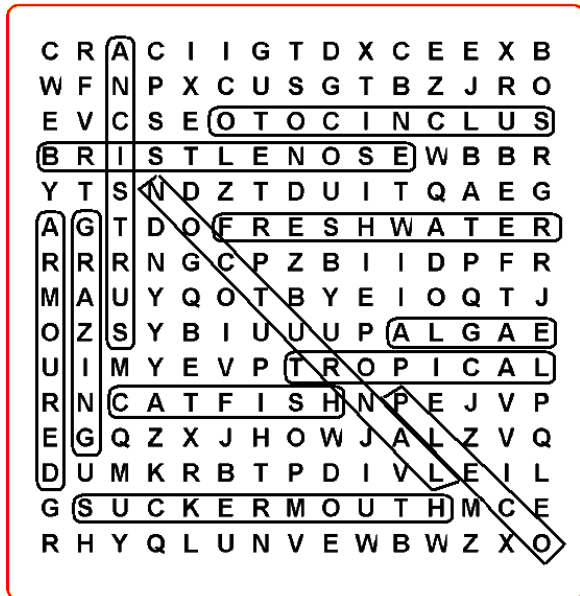
Silent Auction



On the left are scrambled words of things you might find in our annual "Silent Auction." Your mission (if you choose to accept it) is to unscramble those words in the column on the right.

PUAMPIR	
LERTIF	
ODOF	
VELARG	
TEAHER	
KOCRS	
LISTGHTRIP	
AZINEMAGS	
STEN	
LAPNTS	

Solution to our last puzzle **A Sucker Born Every Minute**



- NOCTURNAL
- TROPICAL
- ANCISTRUS
- OTOCINCLUS
- ARMoured
- GRAZING
- SUCKERMOUTH
- PLECO
- CATFISH
- ALGAE
- FRESHWATER
- BRISTLENOSE

A hand holding a clear plastic bag containing a koi fish. In the background, there is a stylized illustration of a koi fish and a globe. The text "Koi Organisation International" is overlaid on the image.

Koi Organisation International

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www.KoiOrganisationInternational.org

