

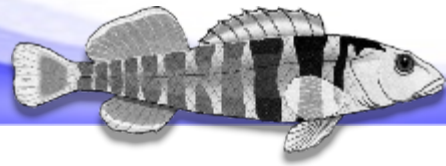
1904 - 2020

V46#3



The
DARTER

May/June 2020
B&W Printed \$5 Members / \$7 Non-members



The DARTER

PRESIDENT

Pat Tosie
1813 Locks Mill Dr.
Fenton, MO 63026
314-616-4316
pattosie@yahoo.com

VICE PRESIDENT

Gary Lange
2590 Cheshire
Florissant, MO 63033
314-412-7636
gwlange@sbcglobal.net

TREASURER

Jack Heller
14212 Trail Top Dr.
Chesterfield, MO 63017
314-576-5111
hellerjackl@aol.com

SECRETARY

Angela Hellweg
511 Sunward Dr
O'Fallon, MO 63368
636-240-2443
pugdog64@yahoo.com

EXECUTIVE COUNCIL

Ian Eggert	ijeggert@gmail.com	262-391-2555
Charles Harrison	Charles@inkmkr.com	314-894-9761
Melanie Holmes	MelanieHolmes7158@yahoo.com	636-293-4161
Mike Huber	Michael.I.huber@jci.com	314-737-6759
Holly Paoni	HPaoni@gmail.com	217-320-5705
Caleb Pitman	Festus2014@yahoo.com	636-232-4461

Program Lead	Member	Contact Email	Phone
Advert & Promo	Ian Eggert	ijeggert@gmail.com	(262) 391-2555
Advert & Promo	Jake Harris	jvbh792@gmail.com	(314) 223-7950
Auction Chairman	Mike Hellweg	mhellweg511@charter.net	(636) 240-2443
BAP Chair	Steve Edie	sredie@charter.net	(636) 922-4232
Convention Chair	Chris Mohrle	propagationaquatics@gmail.com	(314) 541-3897
Corresp Secy	Pat Tosie	pattosie@yahoo.com	(314) 616-4316
Exchange Editor	Kathy Deutsch	kathy@skdeu.com	(314) 741-0474
Fish Rescue	John Van Asch	johnsfishy0731@att.net	(618) 604-7228
Flower Lady	Angela Hellweg	pugdog64@yahoo.com	(636) 240-2443
HAP Chair	Mike Hellweg	mhellweg511@charter.net	(636) 240-2443
Historian	Cory Koch	sithlid@gmail.com	(636) 278-0736
Hotel Liaison	Mike Hellweg	mhellweg511@charter.net	(636) 240-2443
Librarian	Dave Rush	fishydave2@yahoo.com	(314) 291-8932
Membership	Ed Millinger	amazoneddy1@yahoo.com	(573) 883-9943
Monthly Bowl Show	Chris Mohrle	propagationaquatics@gmail.com	(314) 541-3897
O-FISH-L Editor	Pat Tosie	pattosie@yahoo.com	(314) 616-4316
Points Tabulator	Melanie Holmes	melanieholmes7158@yahoo.com	(636) 293-4161
Program Chair	Gary Lange	gwlange@sbcglobal.net	(314) 412-7636
Refreshments	Watson's	robertwmrmsh@yahoo.com	(217) 532-3238
Social Events Coord	John Van Asch	johnsfishy0731@att.net	(618) 604-7228
Social Media	Holly Paoni	hpaoni@gmail.com	(217) 320-5705
Swap Chairman	Holly Paoni	hpaoni@gmail.com	(217) 320-5705
Webmaster	Charles Harrison	Charles@inkmkr.com	(314) 894-9761
Welcoming	Ron Huck	emperortetraron@yahoo.com	(314) 481-2915

THE DARTER

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The editor reserves the right to edit any article for length, clarity, or content. Photos provided are by each Author unless otherwise indicated.

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Proper credit must be given to the author and two copies of any publication in which a reprinted article appears must be sent to the exchange address below.

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MASI will exchange THE DARTER with other aquarium societies.

Failure to receive three consecutive issues of a society's publication will be considered as a termination of our exchange, unless advised to the contrary. Send electronic versions to editor@missouriaquariumsociety.com

MEMBERSHIP

Annual membership in the Missouri Aquarium Society, Inc. is \$15 and includes an electronic subscription to The Darter. B&W printed Darter's are available at the meetings for Members: \$5; Non-members: \$7. Published six times per year.

Join or renew membership at any meeting, most club events, by PayPal from the MASI Website's Membership Page or by contacting the membership chair.

EDITOR Chuck Bremer editor@missouriaquariumsociety.com www.missouriaquariumsociety.com



Cover - St Louis Ferris Wheel - 1904 & 2020

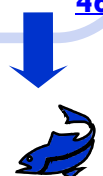


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FROM THE PRESIDENT'S TANK

Pat Tosie

Keep looking below water....

Chuck Bremer

FROM THE EDITOR



Bet you're busier than you thought you would be during this pandemic!

However, there are lots of fish tanks/rooms being redone and lots of fish being put up for spawning. When things become more "normal" there should be lots of things available in the community of Aquatic Hobbyists. Our Social Media pages are already catching a lot of activity and interest. Go check them out.

Unfortunately, the pandemic has been hard on the established Local Fish Shops. Please patronize them. Many are trying very hard to innovate to serve you and compete in whatever the "new normal" will be. They have added call in orders and curbside pick up or even shipping in some cases. Check their ads and the Shop Hopping page for their phone numbers. They are eager to hear from you about how they might best serve our St Louis community of Aquatic Hobbyists. Develop a relationship with them and find out how to best take advantage of our local resources. You will appreciate it.

It should be obvious from the cover that this is a bit different issue. Extra space available plus the continuing need to provide some reading materials for those staying at home offered some opportunities. Correspondence sparked by the last two extended issues have given rise to information about club history that may make future articles. This Darter issue consists of two reading areas:

1. **21st Century fish keeping:** 10 pages of 6 articles about modern , tips and techniques, in the style one would find in most recent Darters should fill the bill for currently useful information.
2. **20th Century Aquatic Hobby in and around St Louis:** 13 pages of 3 articles, 1 original and 2 re-published- likely written by S. Chichester Lloyd and George H. Pring, about the era are meant to create a teaser for future articles. Read this 2nd section to get hints of future articles.

Give feedback on content, readability and formatting in each section. Let me know preferences and which type of article interests you.

MASI's Annual Weekend was originally scheduled for April, then moved to May, then considered for June, and FINALLY put on hold until at least this Fall. Even though things are beginning to open up for commerce, large crowds are still prohibited and so are most club F2F events. All major, annual conventions have been canceled or postponed and clubs' events have, largely, been relegated to on-line webinars or meetings.

ALL dates of events have been removed from this Darter.

Things are changing rapidly with all clubs and dates are unstable. Hopefully, robust calendars can be back in the July issue as things develop for the longer term and stable date decisions can be made for larger gatherings.

ABOVE ALL, set aside some time to WRITE FOR THE NEXT DARTER!! We will need articles and cover photos.

Content deadline for the 4th Darter of 2020 is July 7th.

[Send Feedback and Letters to the Editor to: editor@missouriaquariumsociety.com](mailto:editor@missouriaquariumsociety.com)



MASI New Memberships for 2020!

Jason Garcia

O'Fallon, MO

Jason Wambach

Fenton, MO

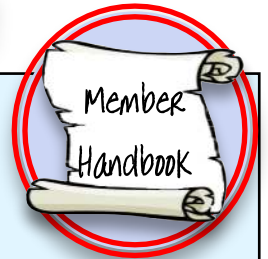
**New Members
since the March
Darter!**

The Missouri Aquarium Society has changed rapidly!

Say "Hello" to new members and make them feel at home. Ask them their experiences and opinions.

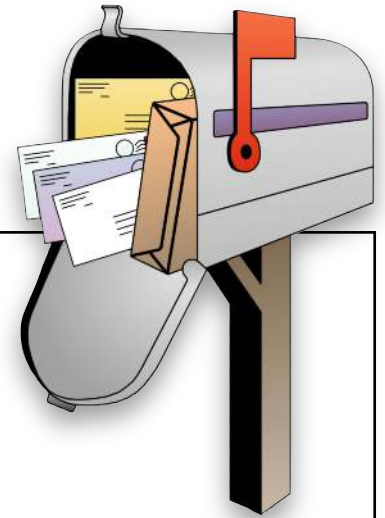
Make them feel welcome! New Members bring interesting ideas that may help improve the club and make it more relevant for all.

Help these Folks get involved and you continue to improve the club!



Found in the Mailbox:

Letters to the Editor may or may not reflect opinions of MASI members or the Council but intend to introduce ideas for discussion.



Possibly Looking Ahead... How about:

The FlyOver Fish Folks, a council of Midwestern Fish Clubs?

Over the years, groups of aquarium clubs in a geographic area have banded together. They do it to make a group of clubs to share local information, do big fish buys, exchange knowledge and have MEGA conventions. They pooled club monies to get expensive speakers for events.

FAAS (Federation of American Aquarium Societies) and NEC (Northeast Council) are examples of clubs that banded together to create something bigger than each club could do separately.

My proposal is to develop a mega-club with the idea of (someday) having an event where all clubs could get together for a weekend of fishy events.

To be honest, this is a pie-in-the-sky idea. No one has a clue what the future will look like. But I do think a cluster of clubs (online and physical) who share ideas and knowledge would be cool. Maybe we could develop a website with lists of Local Fish Stores and regional fish/plant breeders...

Anyone want to kick this around with me?

Email me (kathy@skdeu.com)

Thanks,

Kathy Deutsch





CHRIS



HOLLY



MIKE HELLWEG

MASI's 2020 Annual Weekend on Hold

Hello all,

Due to the continuing COVID 19 pandemic, even though many locations are beginning to open up, we feel that for one there is simply not enough time to adequately promote the MASI Annual Weekend, even in June. Further, at this time there is no guarantee that St. Louis County will lift the ban on larger groups getting together in time for us to do any serious planning, and planning without the order being lifted is pretty much a waste of time. Just as importantly, should the ban be lifted, there is no way we can ensure that folks will follow social distancing, mask wearing, and other potential rules during the event once the crowds enter the room as we're seeing now as businesses start to open up.

This will either cause many especially of our older (and more active!) members to simply leave or not even show up, and many others to avoid the weekend altogether. Either way, at this time it just doesn't look like it will be a productive thing for us to try and throw together. Postponing it further will run too close to the August Auction and even to the September Swap. Therefore, at this time, all three committee heads (Chris – Show Chair, Holly – Swap Chair, and Mike –

Auction Chair) have decided that it is best to cancel the Annual Spring Weekend.

It may be a good idea to still have the Annual Banquet and Fish Bucks auction in the Fall, but this is something we can talk about and start planning once we can get together face-to-face.

Respectfully submitted,

Chris Mohrle, Convention/Show Chair

Holly Paoni, SWAP Chair

Mike Hellweg, Auction Chair



Editor's note:

For similar reasons, all advertisements of dates for events have been removed from this

Darter. This includes MASI events as well as events of other clubs around the US and the standard Conventions usually held during the year.

Most conventions are already cancelled or postponed until sometime in future years. Most club Face-2-Face activities are being cancelled or postponed on much shorter notice but appear to have been eliminated at least until the next Darter issue.

As uncertainty is removed and the reopening of close contact

occurs, these dates will be reinstated in future issues.

Please have patience and take advantage of MASI's Social Media or some of the online webinars if you so choose. Where warranted those will continue to be advertised in an email blast to members.

Stay Safe!





EXCHANGE EDITOR'S CORNER

Kathy Deutsch

Hello! I am new at this, and the column may change as I listen to members, and refine it.

I plan to peruse other clubs' publications and note the original articles. Then I will mention the original articles here. Current MASI members may then email me (Exchange@missouriaquariumsociety.com) to request a copy of an article and I will email it back to them.

Furthermore, when I come across an article written by a MASI member, reprinted in another publication, I will let the points tabulator know and will mention it here and via email to the author.

MASI has a LOT of original material every issue compared to many clubs, this is exciting to see.

Here we go!

Received Recently:

GPASI (Greater Pittsburgh Aquarium Society, Inc) April 2020 "Finformation"

- "Fish-Sitting in a Professional Fish Room" by Rich Terrell {neat first person account}

YATFS (Youngstown Area Tropical Fish Society) "The Youngstown Aquarist"

- "*Corydoras pygmaeus*-Pygmy Cory" by Brian LaNeve - May 2020
 - "*Nothobranchius korthausae*-Yellow" by Brian LaNeve - April 2020
- {both articles have solid info}

GAAS (Greater Akron Aquarium Society) May/June 2020 "Tank Topics"

- "8th Conference of Poeciliid Biologists" by Rich Serva {interesting, lots of info about the convention and the scientific aspects of many people's work}
- March/April 2020 "Youkihi Medaka *Oryzias latipes* var. Youkihi" by Elsie Swanson {seriously jam-packed with info and observations.}

RAS (Raleigh Aquarium Society) April 2020

- From "Fish Posts" "Rams-A Lifelong Favorite Fish" by Thomas Narten {first person account about keeping and breeding}

EIAA (Eastern Iowa Aquarium Association) March 2020 "Fin Flap"

- "Acclimation Rethink" by Dick VanHyfte (lengthy and smart observations on how to acclimate)

NJAS (North Jersey Aquarium Society), March 2020 "Reporter"

- "Siamese/Asian/Algae Eater *Crossocheilus langei*" by Chuck Davis (short, solid info)

- "Dr. Paul's Fish of the Month *Hyphessobrycon vilnae* Gery 1966" by Dr. Loiselle (It's Dr. Loiselle, what can I say. Smart and interesting read. Obviously)
- "Striped Headstander and Red Mouth Headstander *Anostomus anostomus* and *Anostomus ternetzi*" by ? (short, but again, solid quick info)

NJAS April 2020 "Reporter"

- "Tropical Fish History Guppies and Beyond" by Bob Larsen (first person aquarist history)
- "Dr. Paul's Fish of the Month *Hyphessobrycon elachys* M. Weitzman 1985" by Dr. Loiselle (yeah, that guy. He makes any fish sound cool)
- "*Teleogramma brichardi*" by ? (quick read, informative)
- "In My Opinion This is the Most Valuable Aquarium Fish *Otocinclus* species" AND "Fish Feeding Hints that Work for Me" both by Chuck Davis (quick hits, lots of info)

NJAS May 2020 "Reporter"

- "Denizen-The Great Pike Livebearer" by Chuck Davis (neat first person account)
- "A Truthful Fish Story" by Roy Allen (comparison study and experiment on male red swordtail size, good and complete)
- "Is The Tropical Fish Hobby Really in Decline?" by Bob Larsen (thoughtful, with reminiscences)

GSAS (Greater Seattle Aquarium Society)

- April 2020 "Some Cool Fish I Got From Lawrence" by Steev Ward (Cool story, and researched well)
- May 2020 "Fish Pandemic" by Steev Ward (well-covered story about an Angelfish illness)



MCAS (Motor City Aquarium Society)
"Tropiquarium"

- April 2020 "White Cloud Mountain Minnows *Tanichthys albonubes* My Breeding Experience for BAP Points" by Dave Costa (nice, step by step article)
- May 2020 "Red Tail Catfish" by Jeffery Olivier (first person account)
- "*Cryptocoryne* sp *Kotu tinggi*" by Mark Allen (nice plant article)

RAS (Raleigh Aquarium Society)

- May 2020 "Spawning *Apistogramma cacatuoides*" by Paul Parks (nice details)

ACLCL (Aquarium Club of Lancaster County) "Tank Tales"

- April 2020 " Mexican Jumping Bean Cichlid *Herichthys tamasopoensis*" by Karen Haas (interesting first person account)
- "Big Bend Manatee Viewing Center" and "A Visit with Segrest Farms" both by Joel Antkowiak (fun to read accounts of tourism)

NEC (Northeast Council)

- April 2020 "Back in Black...Water" by William Chance Peragine (wow. Long but interesting article, everything about black water)
- March 2020 "Raising Royal Farlowella Fry" and "DIY Tips, Tricks and Treats" both by Joan Snider (first person account with a lot of info.)

KWAS (Kitchener and Waterloo Aquarium Society)
"Fins & Tales"

- April 2020 "The Tale of Two Stands" by Chris Kloestra (entertaining stand building, really!)
- "Not Much on Colour...But Oh Those Lips" by Al Ridley (Gouramis. Nicely done)
- "Rabbit Snails" by Glenn Roberts (informative read)
- "My Favourite Central American Dwarf Cichlid *Cryptoheros nanoluteus*" by Zenin Skomorowski (colourful and fun to read)

GCAS (Greater City Aquarium Society New York)

- April 2020 "The Common Denominator of Success in Fishkeeping" by Jules Birnbaum (lots of good points)
- "My Three Tetras" by Susan Priest (first person and interesting)
- "Standing Tall" by By Stephen Sica (about finding a fish stand, fun to read)

CAFE (Champaign Area Fish Exchange)
"InSeineMenu"

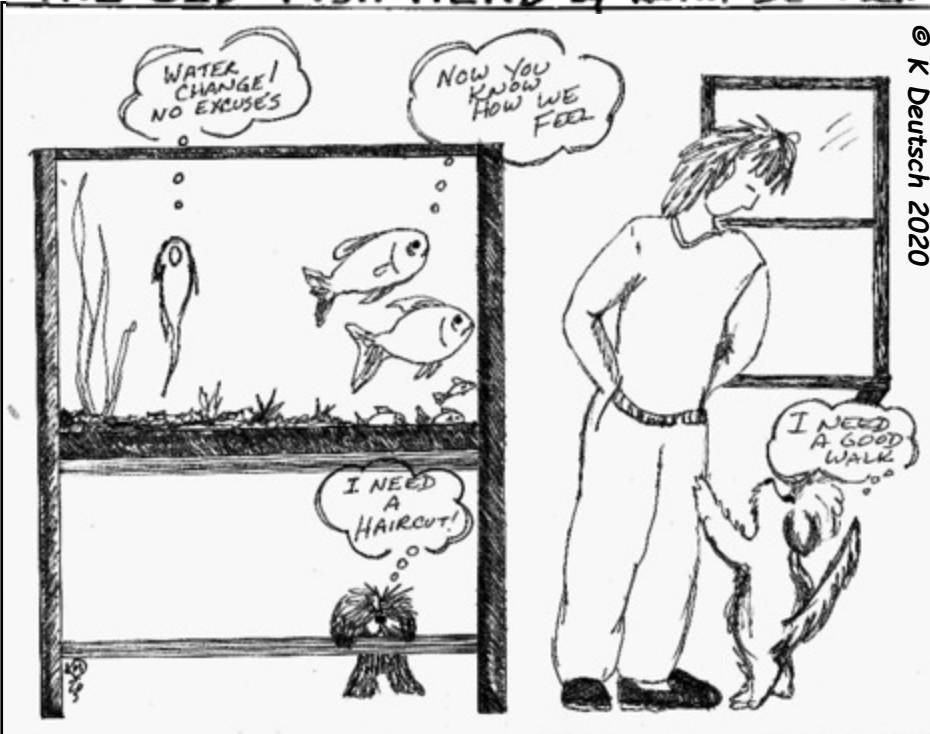
- February 2020 "Setting Up My First Real Tank" by Susan Stearns

MASI authors reprinted:

Rick Renfrow "One Man's Trash is Another Man's Treasure, An AquaBid How-To" reprinted in the BCAS (Bucks County Aquarium Society "Buckette" April 2020



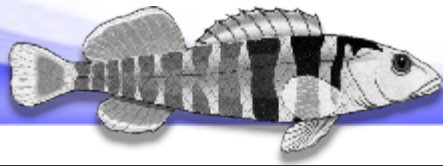
THE OLD FISH HEAD by KATHY DEUTSCH



Blast from the Past!

Mike Hellweg (MC) getting instructions from **Reet Thomas (President)** at the Bevo Mill in 1997





The DARTER

MASI 2020 Challenge

CONSERVATION FISHERIES

PRESERVING THE SOUTHEAST'S AQUATIC BIODIVERSITY

KNOXVILLE, TN



#savethefish



Conservation Fisheries, INC

is a non-profit, 501(c)3 organization in Knoxville, Tennessee. Founded in 1986 and incorporated in 1992, CFI is dedicated to the **preservation of aquatic biodiversity** in our streams and rivers. Over nearly 30 years they have developed techniques to propagate more than 65 nongame fish, including some of the

most imperiled species in the southeastern United States. They were the first facility in the Southeast to propagate rare, non-game fishes for recovery work.

Their primary goal is to **restore fish populations** that have been eliminated because of pollution or habitat destruction. However, CFI also produces many rare or difficult-to-collect species for other purposes related to aquatic conservation.

Conservation Fisheries is most proud of the region's freshwater fish diversity, which includes more than 400 species, many of them threatened or imperiled.



GOAL:
\$2000+

Watch here for CFI featured species profiles each Darter issue of 2020: © CFI

Erimystax dissimilis | Streamline Chub

The Streamline Chub was propagated by CFI to serve, along with the Blotched Chub, as surrogate species for the highly imperiled slender chub (see account).

We were able to spawn and rear this species while housing it with the con-generic Blotched Chub. Both species scattered eggs over clean, relatively coarse gravel in our culture aquaria.

Handling of eggs and larvae was relatively easy and

the two species were easily separated within a month or so of spawning. Because of their relative ease of handling and rearing, we are encouraged that if we were ever to locate any of the slender chubs, we would be able to propagate them.



***Crystallaria asprella* | Crystal Darter**

The historical range of the Crystal Darter included the Mississippi River basin, from Wisconsin and Indiana, southwards to southeastern Oklahoma, northern Louisiana, southern Mississippi, the Mobile Basin, Pascagoula, Pearl River, Florida, Alabama, and Mississippi. It is now absent from much of this range and is rare in Wisconsin, Minnesota, Iowa, and Missouri. It is found in swift-flowing streams with clear or slightly turbid water and moderately swift riffles, on small or medium-sized rivers with beds of sand or gravel. It is not found on silty bottoms or areas with vegetation. Individual fish often hide under stones or bury themselves in sand with just their eyes showing.

The Crystal Darter is a new species we are working with as a surrogate to the Diamond Darter, its closest relative. In working with the Crystal

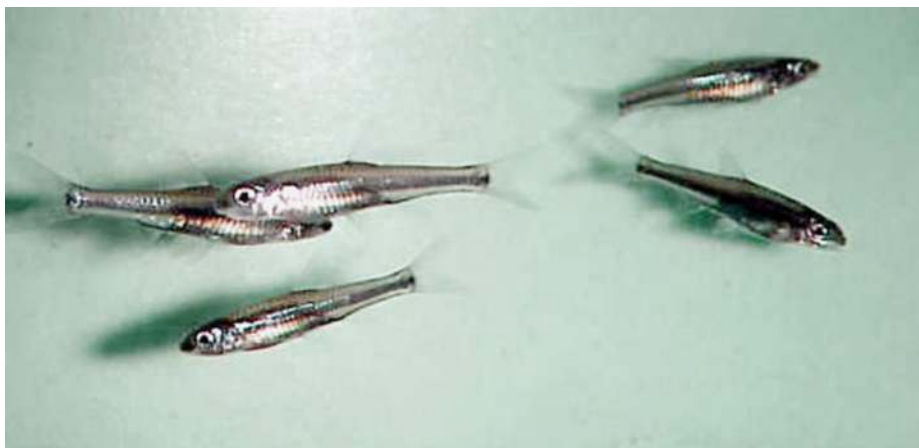
Darter we hope to understand its life history requirements and use them for propagation efforts with the Diamond Darter.



***Notropis cahabae* | Cahaba Shiner**

The Cahaba Shiner is restricted to the middle Cahaba River and the Locust Fork, both in Alabama. CFI propagated these fish for the EPA to be used in toxicology studies. Studying responses to toxins on imperiled and presumably more sensitive species as opposed to the common, hardy species often used in laboratory situations makes sense.

We were also able to study the reproductive biology of these rare fishes. We found that Cahaba Shiners deposit their eggs in fine vegetation. The eggs resemble a mucus-like mass, and like the Cape Fear Shiners, larvae hatch premature with no pigment or eye development. It takes several days for these funky little larvae to finish developing and swim around.



***Etheostoma sanguifluum* | Bloodfin Darter**

Like most of the *Etheostoma maculatum* species group, the Bloodfin Darter has a fairly small range and patchy distribution. It is found in the southern reaches in KY and northern TN. Like most of the members of this species group the Bloodfin Darter prefers fast-flowing water, at the head of riffles, or even in riffles.

In 1993 the first Bloodfin Darters were collected from Big South Fork, KY. These fish were brought in to develop breeding protocols for working with the endangered Boulder Darter, *E.wapiti*. In 1994, the Bloodfin Darters successfully spawned using a tile crevice just like we use today for the Boulder Darters.





MASI AUCTION MESSAGE

Mike Hellweg

register as sellers 3 weeks before, and everyone will be able to register to sell 2 weeks before.

One big auction change that the hotel has asked us to make: **NO MORE STYROS** left in the room.

After the February auction, we had so many styros donated and for sale in the auction that didn't sell that there were enough Styros left in the room to nearly fill a dumpster, and the hotel had to call (and pay for) for an extra pickup. As a result, from now on they will be charging us for each box left in the room. That means MASI will have to pay for them. Due to this change, we will be implementing a \$5 per box charge against anyone who leaves a box in the room.

I will make arrangements to have a few Styros for sale as we usually do, but that will be it. We already have for all that we need. We do not need any more. We will NOT ACCEPT ANY Styros at all of any size, either as sale items or as donations. Please recycle or dispose of your own fish boxes properly with your own waste haulers.

As always, the hotel will have lunches available. And we'll have a very special raffle item. Watch for more details in the next months. The raffle will run Saturday and Sunday, and be drawn at 4:00 pm on Sunday. See you there!

Not much fun to say this issue as due to COVID 19 and social distancing rules we didn't have our annual spring weekend.

Hopes were that we would be able to have it at the end of June, but keep tuned in to the website, Facebook and Band and watch your email for a blast from Chuck and Pat for any updates or changes. As always, for the next auction members will be able to



*And for now, 'nuff said,
Mike*

auction@missouriaquariumsociety.com

SHOP HOPPING - St Louis Area, 2020



These Local Fish Shops (LFS) help introduce hundreds of people to the Aquatic Hobby every day.

They also help the Missouri Aquarium Society reach those hobbyists and keep them engaged by promoting our programs. **Support their programs too!**

Happy Fish Shopping!

The Missouri Aquarium Society

Local Fish Shop	Location	Phone
AquaWorld, Gravois	St Louis, MO	(314) 772-0100
AquaWorld, Manchester	Ellisville, MO	(636) 391-0100
Corals-n-More	St Charles, MO	(636) 757-3684
Give Shops a Call or Order On-Line where available		
Malawi Aquatics	Florissant, MO	(314) 830-6460
Midwest Tropical Fish	Jerseyville, IL	(618) 946-7408
Pet Connection	St Louis, MO	(314) 773-7387
Petco, N Lindburgh	Florissant, MO	(314) 839-5136
Sailfin Pet Shop	Champaign, IL	(217) 352-1121
Saltwater Paradise	Fairview Heights, IL	(618) 514-9571
Seascape Studios	St Louis, MO	(314) 843-3636
Tropical World Pets	Webster Groves, MO	(314) 849-4020





Interacting with the Missouri Aquarium Society on Social Media

There have been changes on the Social Media scene for clubs like ours and MASI has seen fit to explore other Social Media platforms. Below is a run down of where to find information and social interaction within our Society.

- **Missouri Aquarium Society's Home page** - <https://missouriaquariumsociety.com/> - Used as a reference page for our activities with direct links to information about ongoing or upcoming programs and membership information. Go here to join or renew MASI membership or to get details about an upcoming event.
- **MASI BAND Main page** - <https://band.us/@masiclub> - BAND is a newly discovered App for many societies such as ours. It is a bit more open than Face Book and easy to join and share information within and with others, even for non-BAND members. Discussion so far appears to be open and generally freely supported. This is a Public MASI Group on Band that can be used to post upcoming events and to have general Aquatic Hobby discussions. Use this page to show off your hobby, interact with others about it or to ask Hobby related questions.
- **MASI BAND Swap page** - <https://band.us/@masiswap> - This is a page specifically for discussion and posting about upcoming MASI SWAPS and other sales efforts by members or others on the platform. Post any sales, rehomes or other livestock exchanges. Do NOT post these to FaceBook.
- **MASI FaceBook Main page** - <https://www.facebook.com/MissouriAquariumSociety/> - We still use this page as a posting location for general MASI information and about upcoming events. Visit it to find the latest postings about what we're doing.
- **MASI Facebook Discussion Group** - <https://www.facebook.com/groups/MissouriAquariumSociety/> - This is a discussion group that can be joined by FaceBook account holders and is useful for exchanging information about care of fish, setting up tanks, etc. To keep MASI in compliance with FB policy, DO NOT discuss sales, trading or even rehoming of any livestock on that platform. Those posts WILL be deleted. Use one of the BAND groups mentioned above.

When posting or sharing on any portion of any Social Media platform, always consider them to be public and readily readable by anyone. Please let Club meeting rules apply: Keep it PG and respect others and their feelings. We want to encourage others, including kids, in the hobby. Post about hobby related items and questions but do not attempt to sell or transfer any legally banned or prohibited species. (If you can't legally sell it at an auction, do not post if on social media.)

If you have any ideas, questions, suggestions or concerns, please feel free to contact our Social Media Chair, Holly Paoni, email hpaoni@gmail.com.

Please note, from lack of use and to consolidate our Social Media presence, the Council has retired the FORUM.

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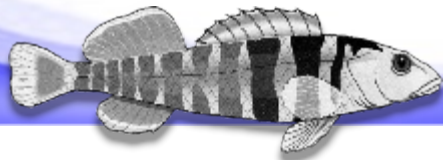


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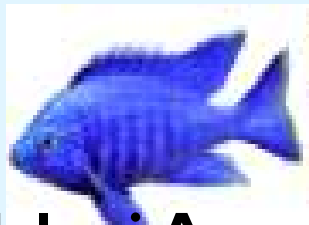




The DARTER

This time has also been especially difficult for most of the Local Fish Shops (LFS). Please be cognizant of their plight and patronize them when you can. Many of them are keeping store hours or offering on-line or by phone ordering with curbside pick up.

All ads have the LFS' phone numbers listed. Call them or visit their web sites when you need something and find out how to make the transaction happen.



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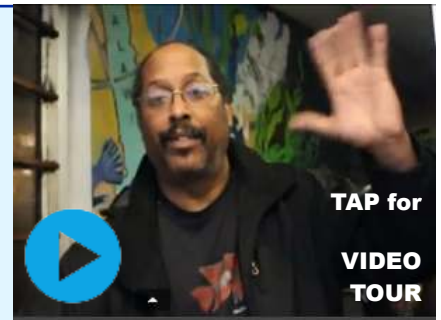


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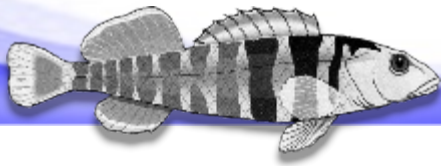
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The Nitrogen Cycle and Importance of Water Changes

Beginning of a Fish Tank Series

By Jake Harris

WHEN I BOUGHT my first fish tank, I knew so little about aquariums and the micro-ecosystems they create. I put the water into the tank, added some gravel and decorations, turned on the filter and assumed that we were ready to add the fish. After all, the water is clean enough for me to

drink, so it should be clean enough for fish, right?

To my horror, I watched as my first fish died one by one and I had no clue what I did wrong! If you have bought your first fish tank, are thinking about buying your first fish tank, or have heard about the nitrogen cycle but don't completely understand what it is, then this is a must read article for you!

This article will give a basic rundown of the nitrogen cycle, what it is, its importance, and how to prevent "crashing" your nitrogen cycle. I'm going to skip a few parts that aren't absolutely essential, but if you learn the nitrogen cycle you'll be able to keep almost any fish alive.

Imagine you're in a room with no way out. (If you're claustrophobic, don't imagine too hard.) Someone opens a hatch in the roof and lowers your food. It's a bit more than you can eat, so you eat some and let the rest set out because there's nowhere to put it. Eventually you'll need to go to the bathroom, however, there are no toilets. ...As you can imagine, that room would get very gross very quickly! Rotting food, feces, urine... ugh! And you're stuck in there! You'd probably die from all that nastiness.

Our fish are stuck in a similar situation. They live in a small glass box stuck in the same water as their rotting food, feces, and other waste. Those

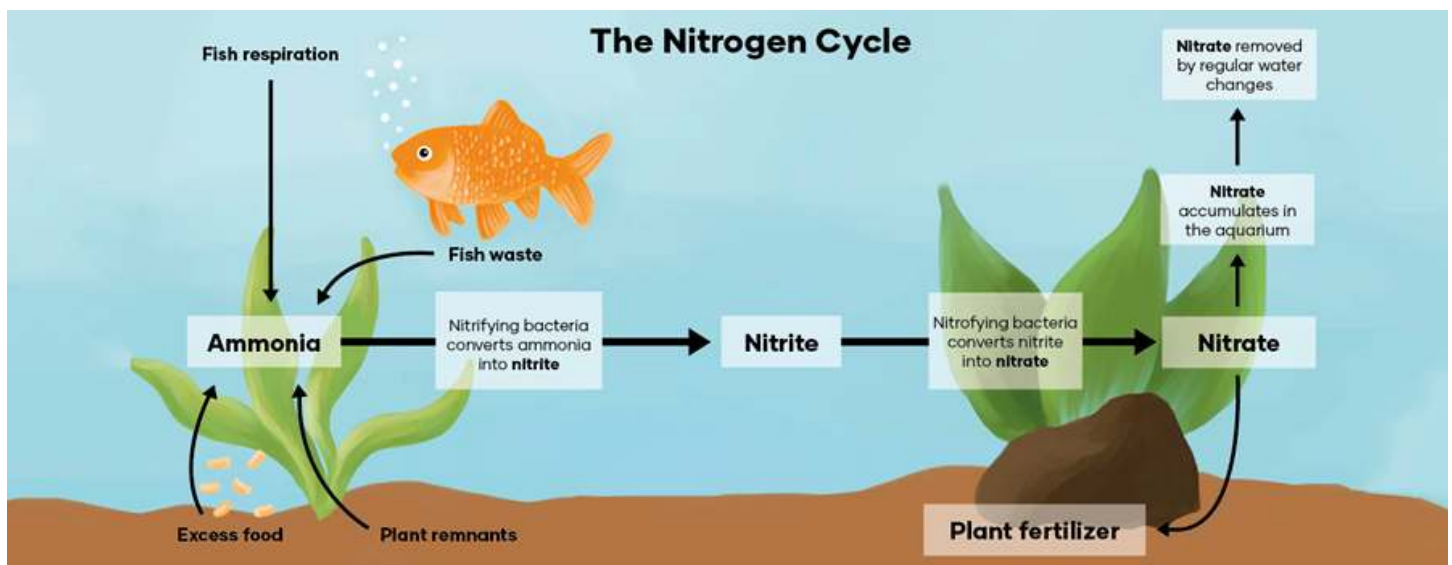
elements of food, feces, and anything rotting release a chemical into the water called Ammonia. Ammonia is very toxic to fish and kills them rather quickly.

However! Fish have allies that eat ammonia and convert it into something less toxic! These allies are commonly referred to as "beneficial bacteria" or "nitrifying bacteria", and refer to all of the "good bacteria" that help keep your fish alive. We will simply refer to them as beneficial bacteria.

The beneficial bacteria then eats the ammonia and turns it into a different, but less toxic chemical, called Nitrite. Then the Nitrite gets converted yet again, by other beneficial bacteria, into Nitrate. Nitrate is the least toxic of the three chemicals, but still toxic, and in high enough concentrations will kill fish as well. These are the terms that you'll need to know: Ammonia, Beneficial Bacteria, Nitrite, and Nitrate.

Without beneficial bacteria, your tank will be full of toxins harmful to your fish, so it is very important to understand where beneficial bacteria live, and how to keep them alive. In order to keep beneficial bacteria alive, you need to understand where the beneficial bacteria lives.

Beneficial bacteria doesn't just float around in the water. It lives on a



surface. Any surface will do, the walls of your tank, the gravel, the leaves of plants, the roots of floating plants, or the filter pad or sponge in your filter.

Objects with more surface area can hold more beneficial bacteria.

For example a piece of glass will hold less beneficial bacteria than a piece of sponge that's the same size, because the sponge has all those holes and pores which give the beneficial bacteria more surface area to hold onto and live. That's why most filters have some sort of sponge or fibrous pad in them. The beneficial bacteria can cling to every single edge of every single fiber of that filter pad- which is a lot of real estate!

A beneficial bacteria can die in several different ways. It can dry out, it can be starved, and it can be poisoned are the 3 most common ways. I've killed my beneficial bacteria in just about every way possible.

- **I've dried it out** by allowing the water level in my tank to evaporate below the intake of my filter, draining the filter and exposing all my beneficial bacteria to the air for too long.
- **I've starved it** by not keeping any fish in a tank for too long, and without fish there's nothing to produce ammonia for the beneficial bacteria to eat.
- **I poisoned it** when I was very young, by cleaning the filter and tank with bleach, soap, and other sanitizing chemicals.
- **I've also, just very recently, removed it** on accident, by removing a large amount of floating plants at one time.

It's a fallacy to think that beneficial bacteria only lives in your filter. By removing the floating plants, I removed all the beneficial bacteria that lived on their fibrous roots. In fact, in a tank that's been running for a while, it's likely that most of your beneficial bacteria lives outside your filter. What I have found is that beneficial bacteria usually begins in the filter, because you're running water through a fibrous surface, but eventually distributes itself rather evenly throughout the entire tank, so even removing a decoration or a plant will remove some beneficial bacteria.

The whole process of growing and culturing your first beneficial bacteria can take two weeks to two months, but the patience will be worth not killing fish.

When your tank is ready for fish, it won't be ready for ALL the fish at one time. You'll want to add fish slowly in order to allow the culture of beneficial bacteria time to catch up. If you have no fish in the tank while the tank is growing it's first beneficial bacteria, a process called "cycling", then there is probably not enough ammonia in the tank to support a large population of beneficial bacteria. Large populations of any living thing need a large amount of food. So by adding lots of fish at one time, you may be adding more sources of ammonia than the current amount of beneficial bacteria can handle. This can cause ammonia levels to spike, and will likely result in dead fish.

Now we know how to keep beneficial bacteria alive in order to convert the toxins called ammonia and nitrite into nitrate, but how do you get rid of nitrate? The best way to get rid of nitrate is by making "water changes". A water change is removing water from the tank and replacing it with fresh, dechlorinated water. Most tap water contains very little nitrate, so removing the water from the tank with a high nitrates, and replacing it with dechlorinated water from the tap with lower nitrates, you can dilute nitrate to a safe level.

Here's a practical example of how water changes work.

Let's say I have a fish tank without a water change in a while. I test my water and I see that my nitrates are at 100 ppm (100 parts per million).

Most fish can only tolerate a range of 0-40 ppm nitrates, but some fish are more sensitive than others and lower nitrates are ALWAYS better.

Important side note: Add new water close to the same temperature as the water already in your tank to avoid "temperature shocking" your fish.

I realize that I have a problem! I already have more than double the "safe" amount of nitrates!! I drain half of my tank's water and now have a half full tank. The water remaining in the tank still has 100 ppm nitrates. So I top off with dechlorinated water. My tank is now full- half of new dechlorinated water of ~0 ppm nitrates and half of old water with 100 ppm nitrates. Of course, the two waters, new and old, mix and their average will now be at 50 ppm nitrates.

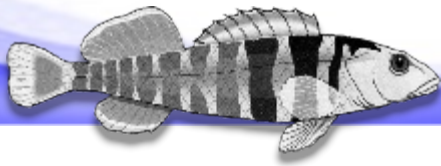
Fifty ppm nitrates is still too high! So I repeat the process of draining half my water and refilling again with dechlorinated fresh water of ~0 ppm nitrates. Now when the waters mix, 25 ppm nitrates is within the safe amount. But if it's lower that's always better. As a rule, I don't change more than 50% of the water at a time, and no more than twice a day unless there's an emergency. This helps limit the mistakes made.

Now that you have a basic knowledge of the nitrogen cycle, and why water changes are important, you can keep almost any fish alive.



Some of Jake's fish





Why Local is Best

...for me

-

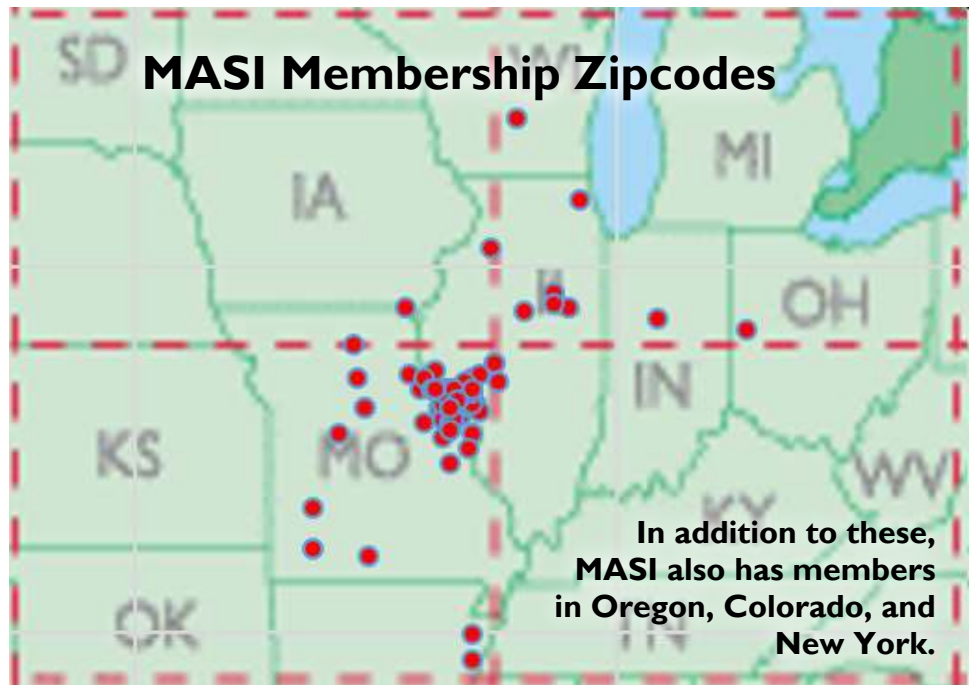
By Kathy Pilarcik
Deutsch

NO DOUBT, IT is alluring. New species, fresh from the wild. Unnamed, wild caught, and the first to be seen in the hobby. ...and there they are, just a couple clicks away. I have been there, more times (and more fish deaths) than I want to think about.

Before the Internet, there were paper fish lists that we received as a part of my job at Beldt's Aquarium Wholesale. Anyone reading this knows that gripping excitement of seeing "first time available"... and when it was financially feasible, we ordered.

After ordering we had the mad scramble of research to understand the needs of what we were getting. If it appeared to be a South American from fast moving streams, we tried to set up a tank with extra water movement, hiding spots, and (ever hopefully) similar water quality conditions. We also needed to know what foods to try and when to try them? Remember, many species only eat at certain times of the day and they may only eat when they feel safe.

This was part of our job as the wholesale recipient, to figure out the fish and pass on that info to the people who would buy them for their shops. Information, along with the desperate struggle to keep them alive, get them



healthy and get them to eat before we could pass them into the retail chain.

Wild caught fish generally have a gut bacteria derived for life in the wild. They may have parasites which don't really bother them but may help them survive. Once you take them out of their wild environment, transport and plopping them into new surroundings and new water, you get reactions. Often heartbreaking reactions.

Locally raised fish are:

- 👉 Accustomed to the local water
- 👉 Accustomed to people
- 👉 Comfortable eating flake or processed food at times when people feed them
- 👉 Unbothered by weird tank decorations, plastic plants, unnatural lighting
- 👉 Usually unconcerned by tank mates that are COMPLETELY foreign to them

Basically, they are already somewhat domesticated.

The best thing about acquiring locally raised fish is availability to speak to the people who raised the fish. I was personally so grateful when I could speak to the importer or the

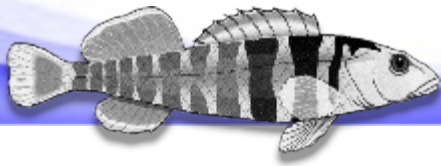
original fish collector about the needs of the fish we imported. We failed often, but sometimes that conversation was the key to keeping the fish alive and thriving.

We were rarely sent sick fish. More often, we just did not know how to care for them. The most trivial information sometimes held the clues to solve the problems.

MASI members are fortunate to have a thriving club with many members who raise fish, herps, inverts, crustaceans and plants. Buying, or at least getting information, from them means I have a better chance of keeping the beings alive. By talking to them I learn something new all the time. The money we trade for their locally-cared for animals is a tangible form of respect for all the HOURS they put into their work.

THANK YOU, Locals!





Spawning *Ctenopoma Nobile*

By Rick Tinklenberg

THE NOBEL GOURAMI, *Ctenopoma Nobile*, also referred to as The Frail Gourami, is one of the Asiatic Labyrinth fish.

In 2005, when I was able to procure this fish, I had little experience with labyrinth fish and wanted to expand my fish keeping knowledge. Considered a difficult fish to keep, I still wanted to give them a try, because they are rarely available. Also, I knew that many times "difficult to keep" meant travel worn and sick from importation and my fish supplier usually got healthy stock.

Nobel Gourami's are native mainly to temperate regions of India and Bangladesh, where heavy rainfall and temperatures between 60 and 90 degrees are the norm. Usually they are found in small ponds and slow-moving creeks and rivers where dense growths of floating plants make catching this fish difficult. Surprisingly, water parameters are medium hardness with a ph. of 7 or just below. Part of this fish's range is the Assam state in India, which is said to have among the highest rainfall annual totals in the world. So, *Ctenopoma Nobile* has an ever-changing environment, which I would think would make it more tolerant in the aquarium.



From SeriouslyFish.com © Hayath

These fish are browns and tan in color with broken white stripes. The male has a red edge on the caudal fin, while the female is fuller in the ventral area. Both sexes have a very pointed head, large eyes and reach a length of 4 inches. While brooding, the female changes to a mottled appearance to blend in better.

I introduced the 6 fish acquired to a well established 20 gal. long aquarium on a top shelf in my fish room. The tank was furnished with Java ferns, terra-cotta pots & pieces, and the surface of the water was covered with water sprite. The tank was equipped with a tight-fitting lid to keep them in the tank and a florescent hood to keep the plants happy. The *Nobile* were offered a varied diet of which they ate frozen bloodworms and community flakes. Tap water was used for weekly water changes and the tank was kept at about 78-80 degrees with medium hardness.

Being on the top shelf meant I had to stretch some to see into the tank, which gave them more privacy. They settled in nicely with none of the difficult fish problems.

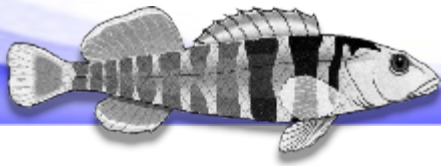
Eventually one fish started keeping to herself up in a corner of the tank. Her color pattern became mottled and she stopped eating. I didn't think she was sick, and her

buccal area looked full. She was brooding. I had noticed no spawning activity, but they were on a top shelf, afterall!

She stayed in her corner for about 20 days, until I could wait no longer! I was afraid she would either release the fry and the others would eat them or she would give up and eat them herself. So, I took her out and stripped her of (very surprising to me) 168, 1/4" long fry. I used the same stripping technique as for East African Cichlids and she did simply fine. The fry took live baby brine shrimp and crushed flakes from the start and were unproblematic to raise.

Because my tap water parameters are similar to their home water and because the fish started out healthy, I had a very positive experience with this species.





Fish-Day Dreaming Makes Me a Better Fish Keeper

By Kathy Pilarcik
Deutsch

THE OTHER DAY, the family was gathered around the oak table, post-dinner. We all quit talking, and began watching the bowfront full of guppies and cories. Back and forth the fish schooled, lulling us into a quiet moment. My daughter pointed out a particularly flashy male, courting several girls. We commented on the *Barbatus* cories, nosing the gravel. It was, like many other times, peaceful and relaxing.

Today I was reflecting on that as I fed the tanks. Fish -dreaming (staring at tanks while daydreaming) has been part of my life since my childhood. Both my kids had tanks of carnival-won goldfish since they were babies. We stare at fish.

When I worked at Beldt's tropical fish hatchery, part of the job was to evaluate fish health very quickly, as we fed. Every day, as I feed the fish in the tanks at home, I am still looking for things I don't even know I am looking for. My hobby of fish-dreaming comes in handy every day, with my fish and my other animals.

When I fish-dream, I am not consciously looking FOR anything. But sub-consciously I guess I am taking mental notes. Is the water crystal clear and moving? Are the plants green and



thriving or is there moss clinging to them? How's the filter doing? I touch the tank to check if it is too hot or cold. And, how are the fish doing? Are they behaving like their species should? Are they schooling or hiding or scrubbing algae like a healthy fish would? Is a former boss fish now acting like a loner? Are the gills pumping?

Evaluating a tank of fish quickly, every day, is a key to keeping fish successfully over time. And I don't think it can be learned, rather, it is absorbed over time. In my case, the problem is that I become complacent. I see the fish and the tanks several times a day and I overlook problems. Sure, the flow is slow, but do I need to clean that filter RIGHT NOW? **(Yes!)** If I ignore that slow filter, then two days later, I have gasping fish and a panic at ...usually!... 10 PM.

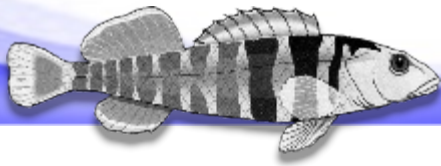
Observing normal behavior in any species helps to identify UNnormal behavior later. When I am fish-dreaming, I watch every fish who is out at that time. I try to fish-dream at night and at morning, when I can. Some livebearers rest near the bottom or in plants near the top at night. The catfish come out in the evening. I only see my *Synodontis*

rarely - at night, and I confess I forget they exist. I do feed the tank with Syno. Food and hope they get it. When a *Synodontis* is out and restless, the water quality at the bottom of the tank is not great.

Fish establish their own levels in a tank. Some enjoy the top, some middle, etc. If you see a group of fish out of their comfort zone, something is wrong. Maybe a plant broke loose and changed the landscape. Maybe a different species moved into the area. Maybe a heater is malfunctioning or maybe the filter flow is different. In any case, fish out of their home areas are uncomfortable. When we fish-dream, we passively note where each fish group is living normally. Any change in their movement will trigger something in the back of our brains to tell us that there may be a problem.

This is a long-winded, common sense-based defense/excuse supporting why I stare at my fish for some time every day. It has been a valuable exercise for me and I think the fish like the interaction with us others who live just outside their watery territory.





Spawning *Taeniacara Candidi*

By Rick Tinklenberg

TAENIACARA CANDIDI IS a very pretty little fish, also known as the black striped dwarf cichlid.

Torpedo shaped body, reaching only 2 inches with a black stripe running its entire length. This fish makes up in color and finnage what it lacks in size.

The male's fins are blue, red and black, set off by the lanceolate shape of the caudal fin and long delicate ventral fins. The female's fins are similarly colored, with a rounded caudal and shorter ventrals. Both sexes have dashes and dots of metallic blue and green around their noses, eyes, throat and gill covers. To see the male with his fins, erect, showing off for his attentive female is an impressive nature moment.

Originating from the central Amazon river, Rio Negro and Rio Branco near Manaus, Brazil. This fish is found in both dark and clear waters near the bank where roots, plants and leaf litter provide plenty of hiding places. In this habitat, water has an exceptionally low conductivity and ph., with temperatures that vary thru out the year.



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When I brought these fish home, they were supposed to be a trio, which was great, since this fish, like many of the *Apistogramma*'s, likes a harem. It turned out later that one of the females was a young male who became a dither target for the dominate male.

Using a previously purchased reverse osmosis unit to soften the water in some of my aquariums, I put the *T. Candidi* into a 20 long with softened water. At the time, my tap water was relatively soft, and I was mixing it with RO water to get a TDS reading of about 125 micro-siemens and the *T. Candidi* liked it fine. I read that this fish did not like big water fluctuations, so I did 10-15% water changes every week or two, which they also liked.

The tank was well established with Java fern, Java moss and water sprite on the top and was on a middle shelf near my sink so I could watch the fish. I put 2 small terra cotta spawning huts in the tank and the female picked the one on the left. The temperature was kept near 80 degrees and they were offered a varied diet of flake food, frozen bloodworms and live baby brine shrimp- which they loved.

Soon what turned out to be the dominate male began showing off for the female and she turned yellow and

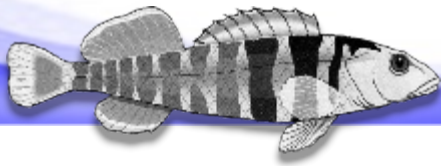
black, but not as intense in color as the *Apistogramma* females do. I never saw the eggs or larvae, which literature says the female hangs on the side walls of the cave. The female would shepherd the fry around while the male "protected" them from the smaller male. The fry took live baby brine shrimp from the start and were no trouble to grow out.



Female with fry

I had this tank of *Taeniacara Candidi* set up for 2 or 3 years and passed on many young to other hobbyist. Over time, new breeding pairs would establish themselves until finally the line just faded out. I really enjoyed keeping this fish and may do so again.





Minifins

The Masked Julie

Julidochromis transcriptus

By Mike Hellweg, CFN
(Certifiable Fish Nut)

EAST AFRICAN CICHLIDS from the Great Rift Valley lakes Malawi and Tanganyika continue to enjoy considerable popularity in the hobby. Some aquarists even specialize in these fish to the exclusion of all others. One fun group of East African fish is the small cigar-shaped Tanganyikan cichlids of the genus *Julidochromis*.

Currently there are 6 species in the genus, each with several locality variants. *Julidochromis transcriptus* is one of the smaller known members of the genus, reaching just less than three inches. They are found in rocky areas of shallow water near the far north end of Lake Tanganyika, in places like Gombi, Bemba, Kalambo, Katoto, and at least six other locations.

Each location variant has a unique color pattern, some so different that if you didn't know better, you'd swear you were looking at different species. These locality variants will interbreed, so do not keep them together in the same tank.

Like all Tanganyikan fish, the Masked Julie prefers very hard, alkaline water with a pH around 8.0,



© <http://www.destin-tanganyika.com>

total hardness over 300 ppm, and carbonate hardness over 100 ppm. The easiest way to maintain this in the aquarium is to use one of the commercial substrates designed for Tanganyikan fish and to add a commercial buffer- sometimes called "cichlid salts".

The current 6 formally described species in this genus:

- 🐟 *Julidochromis dickfeldi* Staeck, 1975
- 🐟 *Julidochromis marksmithi* W. E. Burgess, 2014
- 🐟 *Julidochromis marlieri* Poll, 1956
- 🐟 *Julidochromis ornatus* Boulenger, 1898 (Golden julie)
- 🐟 *Julidochromis regani* Poll, 1942 (Convict julie)
- 🐟 *Julidochromis transcriptus* Matthes, 1959 (Masked julie)

Do not confuse cichlid salts with either marine salt mix or with table salt! What people call table salt, or simply salt, is only one of many types of crystalline chemical compounds collectively known to chemists as "salts". These compounds are what

"cichlid salts" refers to, but not to table salt. Do not add table salt or marine salt mix to your Tanganyikan cichlid tank! The special Tanganyikan cichlid salt buffers on the market are designed to add the specific chemicals, minerals, and trace elements found in the Great Rift Lakes to your water to make it more suitable for these fish.

Fortunately, in most areas of the USA we have water that is already very hard and alkaline, which serves our purpose very well without any additives.

The waters of Lake Tanganyika are fairly stable with a temperature in the mid to upper 70's Fahrenheit. The water is usually clear and low in dissolved organic substances, so good filtration and large, regular water changes are required.

In smaller tanks, hang on the back type filters are ideal. For larger tanks, canister filters do an excellent job. Be sure to regularly maintain the filter according to the manufacturer's instructions.

If skimping on water changes, the pH will begin to drift lower and the buffering capacity will slowly decrease, eventually leading to stress on the fish then disease and death. Long before death happens, they will stop thinking about spawning, so if you want to breed them, consider water changes one of the keys to success.

The Masked Julie likes to be in or near cover most of the time. It's a good idea to design their tank around



this propensity for cover. It prefers tight crevices to other types of caves, so the ideal rocky area designed for Masked Julies would be a pile of rocks going across the entire back of the tank from the base to near the surface, and even filling part of the front of the tank.

Stack the rocks carefully to create myriad narrow caves and crevices. There are no plants in this part of the Lake, so most aquarists leave them out. If you would like to use them, plants like Anubias and Java fern attached to the rocks, or any of the *Vallisneria* found in the hobby will all do well in harder, more alkaline water.

Most of the Julies available today are raised by commercial breeders so they are already accustomed to high quality flakes and pellets as a staple food. Many breeders use these foods exclusively, but no one food contains everything so it's not a bad idea to mix in frozen or live foods occasionally.

In the wild they eat different kinds of freshwater plankton that live in the lake, so feed them something similar in your tanks. They will eat frozen brine shrimp, daphnia, bloodworms, mysis shrimp, and small live foods like baby brine shrimp, daphnia, Grindal worms and similar fare. Since the adults are fairly small themselves, they will eat baby brine as a daily staple. But if you don't want to feed BBS to the adults, at least start adding it as soon as you see fry in the tank.

If you are interested in getting them to spawn for you, it is best to start out with a group of six to eight juveniles and let them grow up together. Males and females look almost identical, so it is very difficult to single out a pair, and even if you can do this, not all "pairs" are compatible. Letting the fish choose their own mates is the most reliable method. When well fed and given plenty of places to hide, eventually a pair will form.

You will know a pair has formed when you notice two fish hanging out together driving the other fish from their part of the tank. Longtime friend and MASI member Ralph Wilhelm loved Julies and got me interested in them. He said to let the pair form from a group. When this happens, one or more of the extra fish will be hanging near the surface.

Remove these fish as you see them since they are definitely NOT part of the pair. After you have removed all of the other fish, the two that remain are a pair. Pretty simple - and it works! In larger tanks with a big pile of rocks, you might wind up with a dominant pair and another satellite pair that takes over a small corner of the rock pile. If not, by removing the weaker fish to another tank, often another pair will form in the new tank, so be prepared for this to happen, too. It's more common than you might think.

Unlike other cichlids, there is no complex spawning dance or display of colors, etc. I've never seen jaw locking, biting or any other courtship display. The best way to know you have a pair is as I described above - the two fish remaining in the rock pile after you've removed all of the subdominant fish.

When they finally do spawn, the female will lay a couple dozen eggs on the walls or ceiling of a chosen cave. Hobbyists rarely see them. Many times, the only sign of a spawn is that fairly decent sized fry, often nearly a month old, are seen moving amongst the rockwork. After hatching, the larvae hang from the cave ceiling for another week or so before finally emerging as free swimming fry. Again, this stage is rarely seen by hobbyists.

Once they are free swimming, the fry are large enough to take newly hatched brine shrimp or microworms. They will also eat finely ground flakes or pellets. While most other cichlid mothers guard the fry closely, the mother Julie does not. Instead, both parents guard the area instead of the fry, which are able to wander around and find food in the myriad tiny crevices in the tank.

Interestingly, fry and juveniles from earlier spawns are all allowed to remain in the vicinity of the parent's cave. Youngsters of all sizes can be seen swimming about the rock pile all day long, picking at the rocks, looking for food.

I have a large rock pile in one of my tanks that goes from the front of the tank to the back, nearly up to the surface, and covers about 4 square feet of floor space in the tank. It is alive with activity of all ages from newly free swimming to nearly adult sized juveniles from the original group of six *Julidochromis transcriptus* "Bemba" that I added to the tank. Two pairs and their progeny call it home.

I can sit and watch them for hours!

The young fish seem to grow quickly at first, and can reach three quarters of an inch in just 5 to six weeks. After this, growth slows considerably, and it will take nearly a year for them to reach maturity.

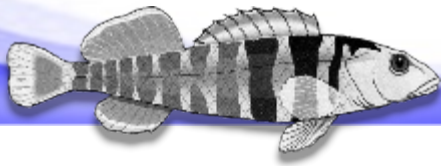
In order to catch them, you may have to disassemble and remove the rock pile very carefully. Once you disturb the rock pile, the original pair won't spawn again for months, so be sure you want to take it apart before you do this! Remove all of the rockwork and net out most of the fish, leaving a group of young fish to re-colonize the tank.

A good sized colony can number in the low 100s, so be prepared to make room for them, or find them homes. And don't forget to sit in front of the tank and enjoy just watching your fish!

REFERENCES:

<http://www.tanganyika.si/DistributionMaps/Julidochromis/>





Making an Automatic Siphon for Tub Overflow Protection

By Chuck Bremer

Reprinted from:

Champaign Area
Fish Exchange
(CAFE):
In Sein Menu
April 2020



PUT SEVERAL TUBS outside during the summer but live in an area that may have 1-2 or more inches of rain in a single rain event. It seems that the young fish often collect near the rim and go over the edge when one of these rain events overflows the tub rapidly.

A siphon was needed that would start operating when the water breached a preset level to keep the tub from running over the edge.

Many fish keepers drill their tubs/tanks to remove water with no mess or spill, but it is easy to make an automatic siphon/overflow that can do the same thing.

It was easy to design and construct a cheap automatic siphon that would remove excess water and keep the water level below the rim. All that is needed are a few PVC plumbing parts available from any hardware or home store.



The principle is to set the outlet of a permanently filled siphon at the desired maximum level of water so any excess runs out the siphon. As long as the siphon retains water over the rim it will continue to function anytime the level inside the tub/tank rises.

PVC Parts list - in this example I'm using $\frac{3}{4}$ " PVC made for a tub of a foot or more in depth.

1. **6 X $\frac{3}{4}$ ", 90 degree PVC Elbows**
2. **Length of $\frac{3}{4}$ " PVC pipe** to be cut into 7 pieces:
 - 2.A **Cut 3** : 2 $\frac{1}{2}$ -3" connecting pieces to turn the elbows into U turns, adjust as necessary for tank rim width and size of PVC used
 - 2.B **Cut 2** : 10" length main pieces just short of the depth of the tub/tank, for shallower tubs, adjust X to fit the depth (X=10"). **IMPORTANT:** These 2 pipes **MUST** be the same length!
 - 2.C **Cut 1** : 8" standpipe for outside the tub/tank, in this

example we want the water to stay at Y"=2" below the rim of the tub/tank so cut this piece at X"-Y" = 10"-2" = 8". If the water should stay 3" below the rim, cut at 7" (10"-3"), etc.

- 2.D **Cut 1** : 7" standpipe for inside the tub/tank, cut this one about 1" shorter than c), adjust length to fit the depth,
3. **1 PVC connector fitting** (optional), to be used as adjustment if needed

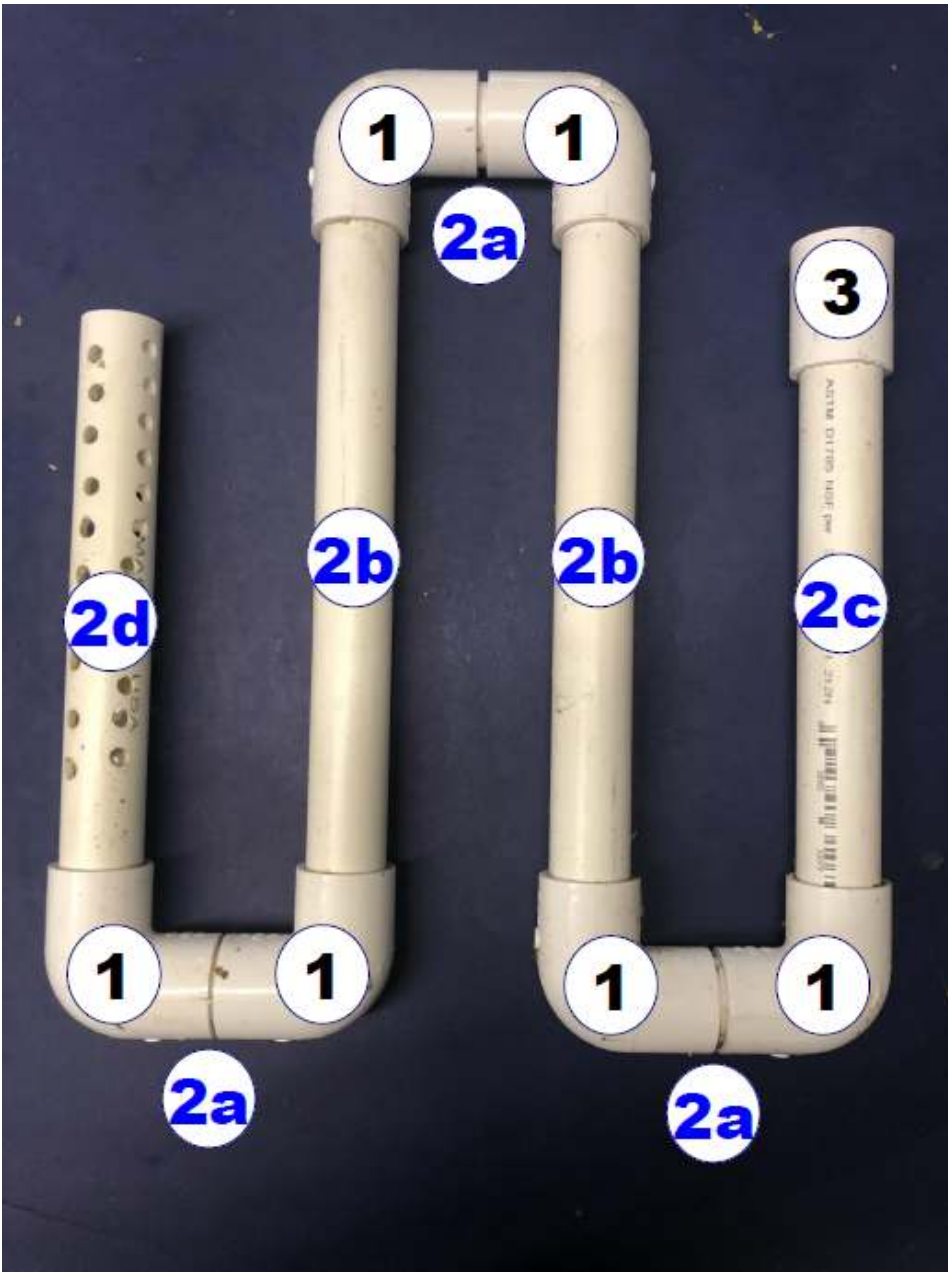
Cut the PVC into the required pieces above. In this case for a 10" main piece b), it will take about 36" of PVC. A 10 foot piece of PVC will yield over 3 auto siphons.

Make 3 U bends by attaching a 90 degree PVC elbow to each end of a)

Connect the 3 U bends by using the main pieces made in b)

Drill holes in the piece made in d) to allow water to flow freely into the tube and connect it to one of the U bends.





Connect the outside standpipe made in c) to the other end.

The autosiphon is finished!

To place into service:

Twist the autosiphon to fit in place so that it will hang tightly to the side of the tub/tank.

Prime the autosiphon by placing into the tub and forcing all the air out of the PVC. Pick up the water filled tube by the center U bend and lift out of the water. Keep the siphon upright so it does not lose its prime, slide it back down over the side of the tub so that the perforated standpipe is inside and the non-perforated standpipe is outside the tub.

If the water level is above the top of the outside standpipe the excess will run out and adjust to that level.

Even if the water level lowers from evaporation over time, when it exceeds the height of the outside standpipe it will begin to run again.

The optional PVC connector can be used as a level adjustment. It was very difficult to get the outside standpipe cut at the proper length. Trimming to lower the water level is easy...unless you over trim. Instead of having to discard mis-cut standpipes, they can be lengthened by about 1" by just putting a PVC connector on the end. In the spring and fall, when larger rain events are more common I like to keep the water level a bit lower so leave

the connector off. In the heat of the summer, with fewer large rain events, adding the PVC connector raises the water level over that period.

Small fish are much less likely to enter the holes of the autosiphon than flowing over the side of the tub in a heavy rain. Remember the water pressure in the tube is very low so the water will flow slowly but in proportion to the height above the outlet. In a heavy rain it flows faster the deeper it gets, however, for very large surface areas taking a lot of water from rain at one time, use more than one siphon.

If you like to change water in your outside tubs, by using an autosiphon, all you have to do is add water and the overflow will flow through without disturbing the fish.

In the fall, to remove water prior to taking down the tub, just remove the outside standpipe and the water level will drop to that level without having to bucket brigade it out.

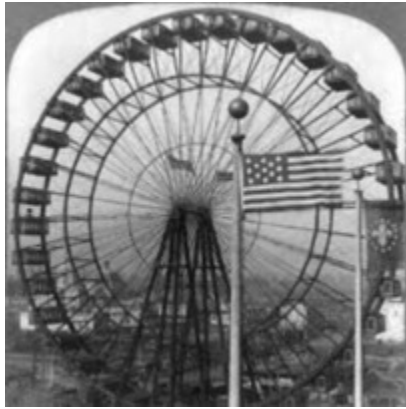
A 3/4" siphon was chosen because it will run at low pressure and the larger diameter will remove more water. Smaller diameter siphons create additional friction and move less water and larger diameter siphons risk moving fish or becoming air-blocked more often during the summer.

In an indoor tank with more slowly added water, a smaller diameter siphon could work successfully.





Meet Me at the Fair: The First Commercial Aquarium in St. Louis



By Thomas M. Keevin

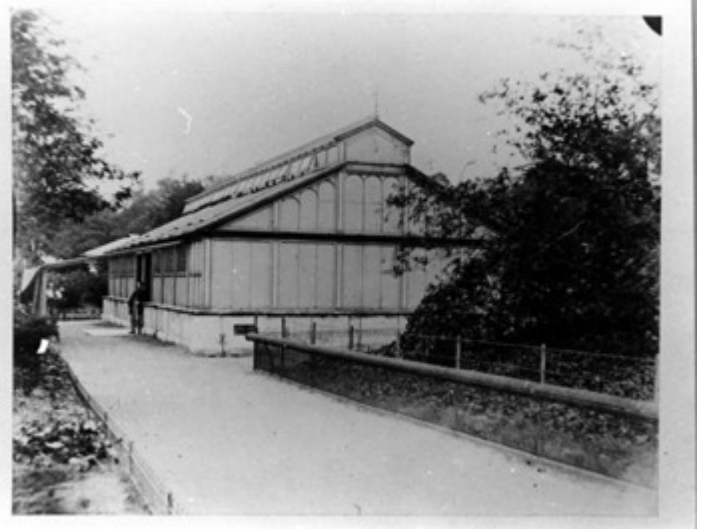
WITH THE OPENING of the new St. Louis Aquarium at Union Station on December 26, 2019, St. Louis finally has a “real” commercial aquarium in our fair city. There have been a number of previous “teasers” with grand plans for new aquariums and failed attempts, with the World Aquarium probably being the last and undoubtedly the most infamous failed attempt. So, with all the bad, distasteful, history behind us and hopefully a bright future, what was the **FIRST COMMERCIAL AQUARIUM** in St. Louis?

The aquariums in the U.S. Commission of Fish and Fisheries Building, the Palace of Forestry, Fish and Game and to a lesser extent, the whale exhibit in the U.S. Government Building at the Louisiana Purchase Exposition (1904 St. Louis World’s Fair) would certainly qualify as our first commercial aquarium in St. Louis. Collectively, they certainly could be considered an early version of today’s public aquariums. Certainly, the US Fish Commission Building would qualify as a stand-alone commercial aquarium, reminiscent of a smaller version of the Wonders of Wildlife National Museum and Aquarium in Springfield, MO. Like the commercial aquarium in Springfield, it had aquariums with both freshwater and marine fish, recreational and commercial fishery exhibits, and fishing related displays. The whale exhibit in the U.S. Government Building (both a Blue Whale cast and skeleton) are reminiscent of the Finback Whale skeleton and humpback whale model in the National Aquarium in Baltimore Maryland

or the Blue Whale model at the Aquarium of the Pacific in Long Beach, California.

The aquarium sections (fish tanks) were the “hit” of both the U.S. Fish Commission Building and the Palace of Forestry, Fish and Game. The judges of the Exposition awarded Pennsylvania’s displays in the Palace of Forestry, Fish and Wildlife five awards including the Grand prize for “Aquaria of Live Fish and Accompaniments”.

Early commercial aquariums were often attached to other totally non-fish related exhibits- much like the Palace of Forestry, Fish, and Game and the U.S. Government Building. For example, the “first recognized public aquarium” in the world is considered to be the Zoological Society of London’s (ZSL) London Zoo’s “Fish House” which opened in 1853. Philp Henry Gosse was instrumental in the establishment of this ZSL London Zoo’s “Fish House”. Gosse was a renowned Victorian naturalist but was, above all, a marine biologist, designing and popularizing the aquarium, a word he invented. He found the term in use during that period, “Aquatic Vivarium”, awkward and uncouth and so coined the term “Aquarium”.



The first public aquarium in the world: The Zoological Society of London’s (ZSL) London Zoo’s “Fish House”, exterior photographed from the south, circa 1875.

The first aquarium in the United States was opened by P.T. Barnum in 1856 as part of his established Barnum’s American Museum in New York. This aquarium has an “interesting and sordid” history. It was the first aquarium to display live whales, predominantly Beluga Whales. The whales were captured off the coast of Canada and transported to New York City. The animal keepers knew little about the requirements of whales, such as feeding habitats, water chemistry requirements, and proper filtration techniques. This resulted in the whale’s death soon after their arrival, with few living more than a week in their enclosures. Barnum, being a shrewd businessman, published obituaries





The interior of the ZSL “Fish House”, circa 1875.

in the local newspapers “mourning” the deaths while announcing the arrival of new replacements. The Barnum National Museum was closed in 1865 after a fire razed the museum to the ground. -So much for an early commercial aquarium conservation ethic!

The first commercial aquarium buildings in St. Louis were only in operation for seven full months, from April 30th to December 1, 1904 but during that period, the St. Louis World’s Fair was attended by nearly 19.7 million people. Although no official attendance records could be found for the specific buildings that housed aquarium related exhibits, the aquarium area in the Palace of Forestry, Fish and Game was a popular attraction and was often extremely crowded.

The three buildings with aquarium related exhibits were all demolished after the 1904 World’s Fair ended. You could watch the demolition of the aquarium buildings for 25 cents! Only the fish tanks in Pennsylvania’s exhibit in the Palace of Forestry, Fish and Game were removed and were used to create the Philadelphia Aquarium at Fairmount Park in 1911.

Even though nearly 19.7 million people passed through the entry gates and crowded the fairgrounds, the 1904 World’s Fair was held 116 years ago, which means that there are no attendees alive today. All the crowds of people with excited faces shown on historical photographs are all dead, so it is impossible to interview the historical figures who were responsible for creating the aquarium exhibits or the excited fair goers who visited their displays. We are left with only a few formal written histories and the interpretation of a few publicly available photographs.

The most historical information regarding the aquarium-related exhibits I found from the U.S. Fish Commission Building because the Commission produced a 54-page publication written by W. de C. Ravenel (1904), with details of the fish tanks and detailed descriptions of every fishery display in the building. General information for the Palace of Forestry, Fish and Game is limited, for the most part, to tour guide books written for fair attendees.

In addition to Ravenel, there is, however, considerable information concerning Pennsylvania’s contribution to the Palace’s exhibits thanks to two articles published in the

Transactions of the American Fisheries Society by Tarleton Bean, 1904; and William Meehan, 1904; a two-volume book written by James Lambert, 1905; and personal accounts written by William Meehan in Pennsylvania Commission reports and summarized in a 1998 article by Jay Osman. A detailed and very interesting account of the history of the Smithsonian Institution’s whale cast and skeleton displayed in the U.S. Government Building is provided in a 2019 article by the Smithsonian.

There are fewer photographs of the aquarium-related exhibits at the fair than you might expect. For example, I couldn’t find a single photograph of a fish-occupied aquarium. In 1904, cameras were much bulkier than they are today and certainly wouldn’t have been carried by most fair goers because of their large size and expense. The fair organizers also placed size restrictions on cameras allowed on the fair grounds. This likely would have restricted semi-professional or advanced amateur photographers and explains why there is no multitude of good amateur photographs. Most existing historical photographs are the products of professional photographers. Because of this lack of photographs, I have attempted to describe, based on the available written documents and few photographs, each of the three buildings with aquariums or what would be considered aquarium worthy displays such as the whale exhibit.

THE U.S. COMMISSION OF FISH & FISHERIES BUILDING



A post card with an artist’s rendition of the U.S. Fish Commission Building

The U.S. Fish Commission Building, located 175 feet west of the main U.S. Government Building, was 136 feet square, with a central open court 74 feet square. Although part of the U.S. Government Building complex, it was constructed as a separate building because of water supply needs consisting of large reservoir tanks for salt water and fresh water, with a capacity of 40,000 and 32,000 gallons, respectively, and the needed machinery room space for the electric pumps, filters, motors, air-pump, refrigerating machine, etc. The interior of



the building was ornate with shells, dolphins, and other fish-forms making the ornamentation. The U.S. Government Building complex also housed the large flight cage that is now part of St. Louis Zoo and which was a factor in determining the present location of the zoo in Forest Park.

In the central portion of the building was an open court which occupied 5,476 square feet where the Commission displayed general exhibits. The comprehensive exhibits were included all things related to the commercial fishery of the United States including fishing equipment, products of the fishery, fish culture, Eastern Oyster culture, sponge culture and so on. For a description of the exhibits, check out: <https://babel.hathitrust.org/cgi/pt?id=loc.ark:/13960/t50g4gs51&view=1up&seq=9>

The description of the 1904 exhibit on the freshwater Mussel Fishing and Pearl-Button Industry of the Mississippi Valley is reminiscent of the current mussel displays at the National Mississippi River Museum and Aquarium in Dubuque, Iowa or the National Pearl Button Museum in Muscatine, Iowa. Today, freshwater mussels are considered the most endangered aquatic group of organisms- which was not the case in 1904 when there was a booming pearl button manufacturing industry that utilized them. Freshwater mussels are an incredibly interesting group, their reproductive behaviors being absolutely fascinating, but remain a taxonomic group that is underrepresented in modern commercial aquariums. These mussels have an interesting story of evolution, ecology, over-exploitation, massive population declines, extinctions, and conservation efforts to tell!



Photographs of portions of the freshwater mussel fishery and pearl button exhibit at the National Mississippi River Museum and Aquarium in Dubuque, Iowa. Photo on left of pearly buttons made from freshwater mussels collected from the Mississippi River and photo on the right of a historical clamming boat and gear (Photographs by Thomas Keevin).

The stated purpose of the aquarium in the U.S. Fish Commission Building was to show: “(1) all the fresh-water and salt-water fishes propagated and distributed by the

Commission; (2) all other important fishes and other water animals of the interior, Great Lakes, and both Atlantic and Pacific coasts which it may be possible to obtain and transport; and (3) ornamental and curious species of fishes and invertebrates of our fresh waters and coasts.”

The U.S. Fish Commission Building contained 40 large tanks, which lined its walls and covered 13,000 square feet. The tanks were of various sizes: two were 12 feet long, 6 feet high and 7 feet wide; four were 5 feet long, 3 feet high and 5 feet wide; five were 3 feet long, 2 feet high and 2 feet wide, and twenty-nine were 7 feet long, 3 feet high and 6 feet wide. These aquaria were separated from the case exhibits of fishery related displays and the square central court, which surrounded them, by corridors 15 feet 9 inches wide. These corridors were in semi-darkness, while the tanks were lighted only from the rear, so that the animals were plainly visible and the general effect was very pleasing. Over each tank was a large circular window for ventilating purposes, and lower down there was a square window in which a comprehensive tank label made of translucent paper was lighted from behind. Opposite the tanks the walls of the corridors were covered with a continuous series of plate-glass mirrors, which reflected the tanks and gave the effect of increased size. In the center of the building was a pool, 24 feet square, open to the sky and surrounded by 12 columns, which support the roof.



Historical photograph of the pool in the center of the building with seals visible in the corner.

Based on the tank dimensions provided in the Fisheries Commission report, the tanks would have collectively held approximately 38,240 gallons of water. Based on the provided dimensions of the pool, 24 by 24 feet with no depth given, but using an estimated depth of 6 feet, the pool itself would have contained approximately 26,000 gallons of water.

There are no published records concerning the species of fish and invertebrates that were put on display in the aquarium tanks. The statement provided was: “The number of different kinds of animals on exhibition at any one time was upwards of 100, and may at times have reached 150. The species were constantly changed, however, by the arrival



of fresh lots, mostly brought in the special railway cars of the Commission. The central pool contained seals, sturgeon, large catfish, and various turtle species.”

THE UNITED STATES GOVERNMENT BUILDING



Post card with an artist's rendition of the U.S. Government Building which displayed a cast of a Blue Whale and its' skeleton.

The U.S. Government Building contained no aquariums, but it did have a skeleton and life size model of a Blue Whale. As I previously described, the U.S. Fish Commission Building, part of the U.S. Government Building complex, did contain aquariums and fishery exhibits. The Smithsonian created the world's first full cast of a whale, which also was the Blue Whale exhibited at the 1904 World's Fair. This type of marine mammal model you would see in a modern aquarium today such as the present day exhibits in the National Aquarium, in the Aquarium of the Pacific or in the New England Aquarium. A very interesting history of the preparation of this specimen, extracted below, can be found at <https://ocean.si.edu/museum/century-whales-smithsonian> Give it a read you will enjoy it!

The next 4 paragraphs are from that Smithsonian article:

On July 12, 1903, the whaling station at Hermitage Bay received word that one of their steamers had hauled in a blue whale, measuring 78 feet in length and weighing 70 tons. Lucas instructed the captain to tow the body “into shoal water [about 10 or 12 feet deep] just as the ebb tide set in.” Once the whale was in position, “tail toward the beach and the head seaward,” resting on its left side, Lucas, Palmer, and Scollick rowed out in a dingy and began the process of preparing the cast. For the next ten hours the Museum workers layered burlap, excelsior, and buckets of plaster of Paris over the whale's body.

They took molds in sections, working down towards the median line of the stomach. Because whale flesh decomposes rapidly, the exhausted group had to continue working until the entire cast was complete. They left the head, which decomposes more slowly than the rest of the body, until last. When “the whale was hauled out on land and decapitated ... as soon as it was severed from the trunk we took a complete cast of the member, jaws and all, both inside as well as out,” and molded the flukes separately.

For the next several days the station workmen helped strip fat from the blubber. The Museum workers were determined that “every part of the whale's frame, even down to the smallest and most minute bones,” would be collected and treated with care.

The expedition returned to Washington, D.C., on July 22, with the skeleton and molds in several large crates. Lucas oversaw the modeling of the specimen, which he had to have completed in time for the St. Louis Exposition the following year. He wasted little time in staging the work, and news of the National Museum's “cetacean monster” captured the American public's imagination.



Historical photograph of a life-sized Blue Whale model cast being prepared in 1903 by Smithsonian staff for display at the 1904 St. Louis World's Fair (Photo courtesy of the National Museum of Natural History)



Historical photograph of a life-sized Blue Whale model cast by Smithsonian staff and its' skeleton featured in the U.S. Government Building (Photo courtesy of the National Museum of Natural History)



It took eight months to complete the enormous mannequin, which was performed in a huge shed built especially for the purpose. The whale form was covered in paper maché, using old paper money pulp from the U.S. Treasury, and painted by Palmer. In early March 1904, the whole was disassembled into sections and shipped by rail to St. Louis. The immense blue whale cast hung from the rafters and was described “as the most striking object . . . showing the natural appearance of this greatest of all living creatures.

When the blue whale cast returned to Washington, DC from St. Louis in 1905, it was suspended from the roof trusses of the South Hall in the Art and Industries Building. After the new U.S. National Museum, now the National Museum of Natural History, opened in 1910, the blue whale cast was moved across the Mall, mounted on a pedestal, and placed at the center on the Hall of Marine Life. For fifty years this seventy-eight-foot cast of the blue whale enchanted visitors to the Museum.” The original Blue Whale was replaced by a new, even bigger, Blue Whale model around 1960.

THE PALACE OF FORESTRY, FISH AND GAME



Historical photograph of the south front of the Palace of Forestry, Fish and Game building. It contained 60 aquariums with native fish sponsored and maintained by the states of Missouri, Minnesota, New Jersey, and Pennsylvania (Photo courtesy of the Missouri Historical Society).

The Palace of Forestry, Fish and Game was considered the least elaborate architectural palace at the World’s Fair. The building was 300 feet wide and 600 feet long, containing

about four acres of gross space, and was built for \$170,454. To the west of the building, Missouri maintained a three-acre area with an artificial lake, 200 feet long and 50 feet wide, where fishing demonstrations and contests were held. In penned enclosures at the lake’s shores were river otters, beavers, raccoon, mink, swans, grouse, quail, and other native animals. River otters are still the first exhibit you’ll see as you enter the fresh-water building at the Tennessee Aquarium and are a popular exhibit at the St. Louis Aquarium at Union Station. So, much has changed, but so much has stayed the same – cute is still popular.

The Palace contained exhibits from 24 different countries and numerous states dedicated to the preservation and utilization of trees, fish and animals. Showcased displays of taxidermy animals, model ships, fishing and gaming equipment highlighted each participant’s exhibit. The most popular area in the building was the aquarium section consisting of 60 fish tanks, a 55 by 45-foot pool and a 40-foot diameter salt water basin dedicated to ocean sea life.

Although general references and tour guides indicate that the Palace contained 60 aquariums, the exact details of tank sizes, species displayed, number of tanks per each state are lacking. Minnesota, Missouri, New Jersey and Pennsylvania all apparently had displays of aquatic organisms. Depending on the historical publication, the aquariums were described as either “large tanks” or “enormous tanks”. So, it is probably safe to assume that they weren’t your run-of-the-mill thirty-gallon fish tanks.

Pennsylvania, for which we have the most information, had 35 aquariums with predominantly food and game fishes of the state. Pennsylvania's display also included a waterfall running through a cement canal into a great pool which contained large fish. William Meehan, in charge of the Pennsylvania exhibit’s collection of material, installation of the exhibit, and the care after being in place, provided a description of the stream and pool as follows: “At the east end of the space extending southward is constructed a circular



WATERFALL AND POOL, PENNSYLVANIA EXHIBIT

Historical photograph of the Pennsylvania waterfall and pool exhibit. The pool contained large fish (From Lambert, James The story of Pennsylvania at the World’s Fair St. Louis, 1904, Vol.II).



pool, twelve feet in diameter and five feet deep fed by water falling over an eight-foot cascade at the east end of the aquarium, and along a winding stream bordered by living evergreens, ferns, cat-tails and rushes. The stream contained live fish and in the pool were huge specimens of catfish and carp, some weighing twenty to thirty pounds each. The pool attracted scarcely less attention than the aquaria itself. All day long the projecting railing was overhung by large and curious crowds, who watch with interest the movements of the huge fish.”



Historical photograph of an aquarium grotto under construction in the Palace of Forestry, Fish, and Game.

Missouri's tanks (number not provided) were arranged in a sort of grotto. Minnesota also had a grotto with fifteen large tanks arranged on the two sides of a fifteen-foot aisle. New Jersey designed a great swampy pool that occupied the center of the building with large game and food fishes of the Atlantic coast.

Transporting fish to the World's Fair in 1904 was much more of a logistics nightmare than it would be today. To put travel into perspective, remember that Ford's Model T didn't come onto the scene until 1908, four years after the Fair. Transporting tens of thousands of fish and keeping them in a displayable condition for an extended period would be a monumental task even with today's technology. Fish for the Pennsylvania aquarium exhibits, were transported from Pennsylvania to St. Louis by a special train car, the Susquehanna, designed to maintain and carry fish. From the railroad depot to the fairgrounds, the fish would most likely have been transported by a horse-drawn wagon.

Not all went well for the Pennsylvania fish tanks in the first aquarium in St. Louis as described below by William Meehan. Although, there is no information concerning fish survival in tanks hosted by other states, or the fish tanks in the U.S. Fish Commission Building, it can be assumed that all the fishes in the tanks in the Palace suffered similar problems. In 1904, aquarium science was not what it is today and the



Historical photograph of the Pennsylvania Fish Commission's fish transport car, the Susquehanna (Photo courtesy of the Pennsylvania Fish and Boat Commission).

problems associated with St. Louis' water quality- ie: water purification methods, and summer heat were not well anticipated.

Per William Meehan: “Nearly five thousand fish were brought in the first shipment and it was attributed to the skill of Mr. Nathan R. Buller that on that one thousand two hundred miles journey only three died. It is to be regretted that condition could not continue, but they were scarcely placed in the tanks before my fears of the unsuitable character of the water provided by the Exposition authorities were realized. The water instead of being clarified by subsidence as it should have been was filtered first by the city of St. Louis with lime and again on the Exposition grounds by means of alum water; water filtered by any process is not well adapted for the maintenance of fish life that which was supplied was so heavily impregnated with lime and alum as to form a heavy deposit on the iron pipes, was necessarily fatal to nearly all the high-grade fishes. The trout, pike-perch, whitefish and blue-pike died within twenty-four hours. Yellow perch and several other species, notably blue catfish, died within a few days. At the expiration of ten days there were not more than fifteen species of fish alive, although curiously enough among those which seemed able to accept filtered water were several thousand Lake Erie minnows. Under the circumstances I felt it my duty to refuse to send another load of fish until the water was put in a better condition. After several weeks this was done by reducing the quantity of alum. I then shipped the second load, taking charge of the car myself. This was in early June, although the water was very warm, less than one dozen fish were lost in transportation. I regret to say that on my arrival I found that the Exposition officials had not kept their pledge to install the refrigerating plant to supply clear water. The consequence was when the fish arrived the water in the tanks had a temperature of over eighty degrees. The trout and many of the lake fishes consequently died very quickly. The refrigeration plant was installed in August, and on the 18th of August, Mr. A.G. Buller, Superintendent of the Erie hatchery, brought down a third lot, losing less than a dozen on the way. Owing to the chilled water in several of the tanks and by heavily icing the water in other tanks were able to carry no less than thirty-six species of Pennsylvania fishes until the middle of September.”

Enthusiasm for Pennsylvania's exhibit was high, with many visitors returning several days in a row to walk through the fish grotto. Even after the fish started dropping dead because of excess lime, aluminum, and heat, the vacant tanks



attracted crowds that came to marvel at the new technology. The judges awarded Pennsylvania the grand prize and four gold medals for their exhibits in the Palace.

THE 1904 WORLD'S FAIR AQUARIUM(S) MEET THE ST. LOUIS AQUARIUM AT UNION STATION

I think I have made my case that the first public aquarium in St. Louis was built for the 1904 World Fair. The Palace of Forestry, Fish and Game and the U.S. Fish Commission Building collectively contained 100 large fish tanks with both marine and fresh-water fish and three large observation pools containing large marine and fresh-water fish, turtles, and sea lions. The U.S. Fish Commission Building was certainly a stand-alone public aquarium, with the same fish/fishery based "theme" as the Wonders of Wildlife National Museum & Aquarium in Springfield, MO, and comparable in size to small commercial aquariums in existence today. If throwing the U.S. Government Building into the mix, it adds a major whale model and skeleton to display. Even today not all public aquariums are under one roof. The Tennessee Aquarium has a fresh-water fish building and a marine fish building as part of their aquarium complex. They also have a third building, off-site fish conservation research building- which most people don't know about, that is only open to the public for tours on special occasions.

Let's put this all into perspective. By comparison, the St. Louis Aquarium at Union Station has 44 "exhibits". The World's Fair aquarium buildings held 100 large fish tanks, three observation pools, one stream with a waterfall and pool, one Blue Whale model and skeleton - a big deal in 1904, cute river otters, and a large number of fish, fishery science, and fishing exhibits. The World's Fair exhibits didn't contain a 250,000 gallon Shark Canyon and certainly no sharks, skates, or rays as far as I could ascertain and its largest glass fish tanks were only 3,770 gallons. But remember, by 1904 standards, the aquariums were beyond state of the art- they were futuristic. Even after the fish started dropping dead in the Palace of Forestry, Fish, and Game because of excess lime, aluminum, and heat, the vacant tanks attracted crowds that came to marvel at the new technology. This was something to behold in 1904!

The approximately 1,500 buildings at the 1904 World's Fair were designed to survive for the duration of the fair and then to be torn down. Their architectural ornamentations were made of plaster of Paris and the buildings were designed to be disposable. Only two major buildings were built to survive and are still standing today, the Palace of Fine Arts is

now the St. Louis Art Museum in Forest Park and the Administration Building is now Brookings Hall, a part of Washington University. It is unfortunate that a third building, The U.S. Fisheries Commission Building, wasn't built to survive after the fair as the St. Louis Aquarium in Forest Park. Remember that Pennsylvania's tanks in the Palace of Forestry, Fish and Game were moved to Pennsylvania after the World's Fair to start the Philadelphia Aquarium at Fairmount Park. What worked for Philadelphia would have worked for St. Louis. If the Fish Commission Building had survived, maybe a public aquarium would have been a continuing part of our St. Louis culture today, as it is in some other major cities. We would have had a 116-year history of generations of St. Louisans learning about fish, aquatic invertebrates, and aquatic conservation, an educational/conservation role that has been left unfilled since 1904. Hopefully, the St. Louis Aquarium at Union Station will take up this banner and become part of our culture!

Acknowledgements

I would like to thank Mike Traux and Max Storm of the 1904 World's Fair Society for providing insight, photographs and just being nice people.

I also wish to Acknowledge other sources for the use of the historical photographs, as noted in their captions.

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How the Goldfish Fad Holds St. Louis



Men of wealth have taken up the hobby and spend large sums to procure rare specimens, stores where they are sold are crowded and the libraries are having difficulty providing books about them - One man has been cultivating Oriental breeds here for half a century



ST. LOUIS is obsessed with the goldfish fad. Without any boosting, without publicity, quietly, almost unobserved, the hobby has spread until its devotees are numbered by the hundreds. Stores where the fish and accessories to their cultivation are sold are doing a big business. Books about goldfish are in great demand at the libraries. They have become more than pets for the children or part of the decorative scheme of the home. Men of business, men of wealth, men of all callings have become interested in them.

When goldfish and men are mentioned in the same breath at once the listener stands at attention to hear a joke; nothing serving better as a symbolic antithesis to man than a fish. Yet the gentlest of all fish, the ornamental branch of the carp family, is being cultivated, cherished and loved, individually and collectively, by real muscular men, men who do things in life, who love the prowess of the field, who scorn the inane.

The culture of goldfish was a pastime in the Orient before Columbus navigated the Western Hemisphere. The Japanese, Chinese and East Indians bred goldfish of fantastic shape and variegated colors as a fad, an art and semi-religious practice and are still engaged in the fascinating pursuit. In fact, some of the most expensive fish come from Japan and some are happy in St. Louis aquaria.

Primarily men of the Occident emulated the East through a development of the artistic: an aquarium of brilliantly colored and peculiarly shaped fish scintillating in a sunny window corner not only pleases the eye; but serves as a nerve tonic, a thing conducive to peaceful thoughts. Dr F. J. Artz has been rearing goldfish, in the

beautiful rustic pond that dots the ground surrounding his home at Twelfth and Lami streets, for the past 50 years and is, no doubt, the most experienced native pisciculturist in St. Louis. He vouches for the mental blessings that fall to him who cultures the goldfish.

The spirit of competition pervading the United States has injected a new element into the culture of goldfish and it has become a gentle game.

Who might evolve the most beautiful type, the most fantastic?

The instant competition entered into the spirit of fish culture the fad became one for men, entirely out of the realm of the endemic; to the four corners of the earth in this day and you will find aquarium societies whose memberships are comprised mostly of men.

Every man likes to outdo his fellow, whether it be in the winning of a particular woman on in rolling a cigarette.

But hist! a little digressive confession in the going: Any man will talk baby-talk to a mute pet if he thinks no one is in earshot, such outbursts of affection have been heard even in the practice of pisciculture right here in St. Louis. This is to show the lowbrow who thinks fish culture is for the mollycoddle that big men can be tender and affectionate.

More than 100 names of local men and women breeding ornamental goldfish as a pastime are listed on the books of S. Chichester Lloyd, president of the National Aquarium Society of America, and the St. Louis branch, in its infancy, has more than half that number for its active membership.

St. Louis has been somewhat tardy in its appreciation for really expensive fish and possibly Lloyd is the only possessor of fish valued above \$100 each. In many Eastern



cities fanciers own fish ranging from \$50 to really \$2000 each

New York has a public aquarium replete with highbrow fish and these aristocrats of the depths attract more attention during the course of a single year than do the rare and beautiful flowers in the famous gardens of Henry Shaw in 10 years. And this is taking into consideration the overwhelming resident population of New York and the high number of transient visitors, too.

St. Louis is not only willing to be shown the value of pisciculture in its most artistic consummation, but is in the very act of looking in! And be it known, goldfish culture is not a game for the rich alone - its pursuit is inexpensive. Indeed, it offers possibilities for earning money, not trifling sums either, but great mortgage-devouring sums. Patience and care are the essential capital stock. Some of the best baby goldfish can be had for 50 cents each and with patient rearing earn an interest which runs rapidly into the decimals of dollars and - beyond!

The St. Louis society is advocating a public aquarium. In this movement, it will have the aid of the Zoological Society, co-operation having been offered by George Dieckmann, president of the latter. All Aquarium owners are interested in the movement.

Thinking of goldfish the majority at once pictures one of those dinky glass globes reposing on a window sill or hanging from a brass chain and containing a few common goldfish bought at the dime store, which swim everlastingly in circles and misery. These constitute the goldfish hell, and, to these there is no further reference than to deplore the practice and express the hope the S. P. C. A. will enlist more active members.

Probably Dr. Artz has maintained the most ideal aquaria and outdoor pool in St. Louis. At present the pool is empty, a temporary condition, obviously because of weather changes. Dr. Artz, however, will shortly stock his pond, start his miniature waterfalls and begin the rearing of fancy fish as has been his wont for these 50 years.

Adolphus Bush III is interested deeply in his splendid aquarium at Grand View Farm, St. Louis County. He is owner of valuable specimens. Wallace C. Capen has an invaluable collection of finny aristocrats - so have Emile R. Cramer, E. A. Faust, C. B. Nicholson - but Capen, perhaps with the exception of Chichester Lloyd, owns the finest fish in St. Louis.

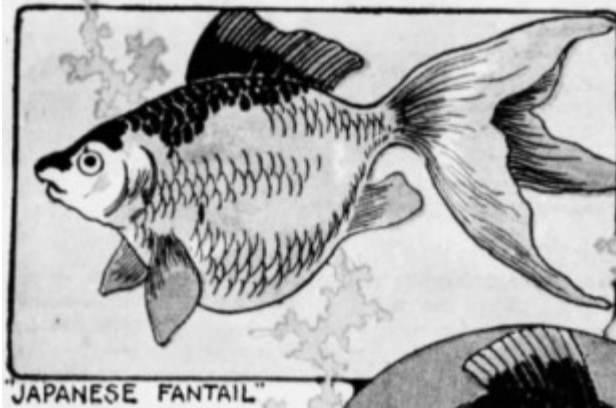
A list of goldfish owners would include Louis C. Koehler, F. H. Wood, Fred C. Lake, Mrs. James Livingston, Theodore Benoist, Miss Julia Papin, Miss Kathleen Murphy, Edward M. Flesh, Mrs. J. T. Drummond, Edwin A. Lemp, August C. Erker and T. H. Gerbart.

Chichester Lloyd, leader of piscicultural art in this country, says he rears annually more than 20,000 baby Chinese, Japanese and East Indian goldfish in his back yard in anything that will hold water, from dish pans to discarded concrete wash tubs and casks.

There is much talk among fish fanciers of the "balanced aquarium." To those who purchase bargain fish globes this might mean an aquarium balanced on a chain.

The term is unfortunate, "reciprocating aquarium" would be more accurate. Lloyd says that in the balanced aquarium there should be a gallon of water to each half inch of fish exclusive of tail, five saggittaria plants or two bunches of myriophyllum, or one of anacharis to each fish. The gallonage of the tank may be determined by multiplying the length in inches by the depth and this by the width and dividing by 231, the answer being the number of gallons. There should be one tadpole and three snails to each fish. Tanks so arranged will be reciprocating and need no change of water. Animals consume oxygen and give off carbonic acid gas and plants commute carbonic acid gas and give off oxygen, therefore unless oxygen is added to the water by plants or artificial aeration, animal life must cease. Tadpoles and snails act as scavengers for the fish and keep the aquarium free of slime.

The highest development of goldfish was not introduced into America until about six years ago when the Philadelphia Aquarium Society by way of Germany some



"JAPANESE FANTAIL"



"FRINGETAILED TELESCOPE"



"VEILTAILED ORANDA SHISHIGASHIRA"



rare specimens of the veiled tailed dragon-eyed goldfish. A man to whom a goldfish was simply a goldfish and nothing more and had brought home one that cost him a quarter of a dollar in a paper pail, might have learned with amazement that a perfect specimen of this fish cost from \$100 to \$2800.

Today they may be had at prices ranging from \$5 to \$50, because of the breeding of several thousand in the United States. These prices are for baby fishes but an inch long! The demand exceeds the supply. As fanciers gobble up these aristocratic finny infants the general public knows nothing of them.

Odd variations in form obtained through scientific breeding are not more amazing than the exquisite color schemes intermingling with the scintillating texture of the skin. These highbrow fish are practically free of scales, a few remaining here and there, like spangles of gold, to make the design more striking against marvelous tones of crimson, purple, blue, orange and pearl. There are occasional black dots not unlike purposeful beauty spots.

But one fish in five million, it is estimated is perfectly marked and the one might be worth actually twice its worth in gold! So after all goldfish and goldmines might be somewhat analogous. There are two, three and even four, long, sweeping tails to a fish, each separate and distinct. The eyes measure a trifle over a third of an inch in diameter and are often turned upward.

The Oranda Shishigashira, or lion-headed fringe-tail, has recently been bred in America. After its second year this fish grows a hood and long tail. A pair might be had for \$1000.

To enumerate and describe the variations of aristocratic goldfish would lend to these paragraphs the air of an essay and at once be a digression. The intent is to throw illumination upon a fastly growing and misinterpreted fad, showing why men are interested in what, to many, seems to be an attraction for children.

A much more attractive scavenger for the aquarium than the snail or tadpole recently has been introduced into this country and he is worthy of mention in that he is luring considerable interest than rightfully belongs to the goldfish, this busy creature is the "Takanohadojo, familiarly styled Dojo. He comes from Japan.

The Dojo is much like an eel in shape, and in Japan is used for food. In the aquarium he is of interest every minute. Not a fragment of food is allowed to decompose, for the Dojo eats everything that might be eaten. In his frantic pursuit of food the Dojo has a habit of plowing through the sands of the aquarium with his face. He moves rapidly, passing sand through his gills as he goes. This queer antic is at times extremely comical. No matter how secretly food is dropped into the tank, the Dojo discovers it instantly. Sight of the food does not seem necessary, the odd fish having some secret method of gathering news.

The Dojo may be kept out of water for considerable time with no fatal result, indeed, he is shipped from Japan,

packed in moist grass only, and is kept alive in his container for weeks.

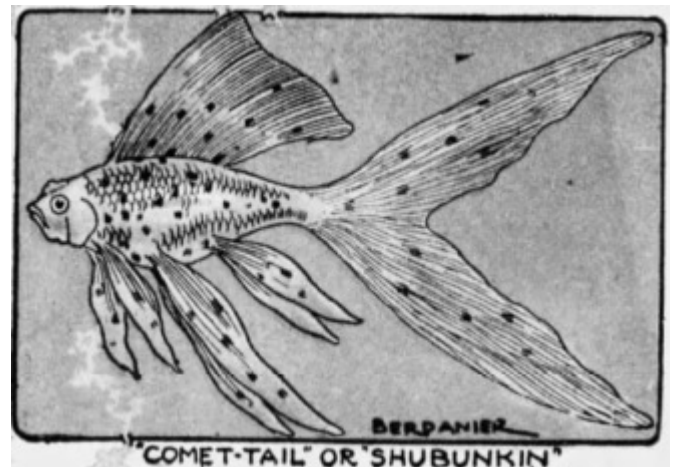
The head of the fish greatly resembles that of the carp and is well provided with barbes, in fact, it has a well developed mustache.

The actions of the Dojo are graceful and he appears like a waving band of ribbon as he swims here and there among the plants. The skin is smooth and slippery to the touch and shines with a dull, golden sheen. They do not molest goldfish or other creatures of the aquarium. They have a curious habit of resting the forepart of the body on the pectoral fins and staring at the observer out of bright red eyes.

The Dojo seems to be somewhat of a thinker and will sit for hours on the tip of his tail - buried in thought, perhaps. About the head his appearance is not unlike the walrus.

The Dojo promises to hold an interest all his own, most particularly because of his business-like characteristics, and also because of the spectacular character of his antics.

Japan has been the source of our fancy fish supply for centuries and probably will continue to be so. Her annual exportation of goldfish alone, runs far into the millions of fishes and since the European war has severed abruptly the supply of tropical and other varieties of aquarium fish, American fanciers have been paying attention to the more easily obtained species of America and the Orient.



Lloyd says the great mistake made by the neophyte in fish culture is feeding the fish anything and everything. Foods containing flowery substances are decidedly indigestible.

Editor's note: This article, published in 1916 and the succeeding published in 2019, contain clues to the earliest days of a St Louis Aquarium Society. Additional information about this early version of the Missouri Aquarium Society between 1916 and 1950 would be welcome to assist writing future articles.



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AQUARIUM EXHIBIT

Through the instrumentality of the St. Louis Aquarium Society, the Garden is fortunate in being able to establish a display of fancy fish, exhibited in specially prepared aquaria which have been installed in the alcoves of the aroid house. The attractive rockwork around the aquaria eliminates the artificiality generally associated with such displays. An additional feature of the exhibit is the use of various aquatic plants suitable for aquaria. Such plants are indispensable for maintaining the life of the fish, possessing the power of generating oxygen. Pure oxygen is essential for fish, while carbon dioxide is a plant necessity ; thus a balance is maintained, the oxygen given off by the plants being utilized by the fish, while the carbon dioxide exhaled by the fish is absorbed by the plants. Without this reciprocal relation it is impossible to attempt fish culture successfully. It has been repeatedly demonstrated by specialists that aquaria containing sufficient plant life may be tightly covered, the plants giving off enough oxygen to support a proportionate number of fish. The feces excreted by the fish are absorbed by the plant roots as food.

The ornamental value of plants in aquaria is another important feature. The plants used may be either native or tropical, placing stress upon those which possess to the largest degree oxygen-generating properties. The best plants for this purpose are: pond-weed (*Potamogeton crispus*), fishgrass (*Cabomba caroliniana*), eel-grass (*Vallisneria spiralis*), water-weed (*Elodea canadensis*), and ribbon arrowhead (*Sagittaria subulata*).

Pond-weed (Potamogeton crispus) .—A native of Europe, forming greenish brown growths. The leaves are lanceolate with undulated margins and the flowers white. One of the best oxygen generators, but an exceedingly noxious weed in outside ponds.

Fish-grass (Cabomba caroliniana).—A native of North America. The green leaves are produced in fan-shaped formation from the central stem which reaches a length of four feet. The plant is quite attractive, but is a rather poor oxygen generator.

Eel-grass (Vallisneria spiralis) .—A grass-like plant native of North America, with strap-shaped leaves varying from one to three feet in length, light green in color, and translucent. The star-shaped, floating pistillate flowers are connected to the base of the plant by a long filament which later becomes spiral, submerging the flower for fertilization. The staminate flowers are globular, produced at the base of the plant, from which they break away, rising to the surface of the water. They float with the stream, pollen exposed, so that when contact occurs with the pistillate flowers, pollination readily takes place. This plant is a very good oxygen generator.

Water-weed (Elodea canadensis var. gigantea).—Native of North America, moss-like in growth. The leaves are in whorls upon light green stems which form strands reaching several feet in length. This is an excellent oxygen generator, growing completely submerged. It may become a pestiferous weed in lily ponds.

Ribbon arrowhead (Sagittaria subulata).—Native of North America. The submerged leaves are equitant, strapshaped, dark green, one foot in length. The growth above water bears lance or sagittate leaves. This plant is one of the most valuable for aquarium purposes, multiplying rapidly by stoloniferous growths and supplying a plentiful amount of oxygen. A very noxious weed in ponds.

PLANTS SUITABLE FOR AQUARIA

Botanical name	Common name	Habit	Habitat
<i>Aponogeton distachyus</i>	Cape pond- weed	Floating	South Africa
<i>Aponogeton fenestralis</i>	Lace-leaf	Submerged	Madagascar
<i>Azolla caroliniana</i>	Water moss	Floating	North America
<i>Cabomba caroliniana</i>	Fish-grass	Submerged	North America
<i>Callitriche verna</i>	Spring starwort	Submerged or floating	North America
<i>Ceratopteris thalictroides</i>	Water fern	Leaves floating or above water	Tropics
<i>Cryptocoryne Griffithii</i>	Mosaic leaf	Submerged	Malaya
<i>Cyperus alternifolius var. variegatus</i>	Variiegated umbrella plant	Leaves above water	Madagascar
<i>Cyprus Papyrus</i>	Egyptian pepper plant	Leaves above water	Egypt
<i>Eichhornia speciosa</i>	Water hyacinth	Floating	Southern United States
<i>Elodea (Anacharis) canadensis</i>	Water-weed	Submerged	North America
<i>Eriocaulon septangulare</i>	Hair grass	Submerged or above water	Southern United States
<i>Fontinalis antipyretica</i>	Willow moss	Submerged or above water	North America
<i>Heteranthera limosa</i>	Bog herb	Floating	North America



Botanical name	Common name	Habit	Habitat
<i>Hippuris vulgaris</i>	Mare's tail	Submerged or above water	North America
<i>Isoetes Engelmanni</i>	Quillwort	Submerged	North America
<i>Jussiaea longifolia</i>	Primrose willow	Floating	Brazil
<i>Lemma minor</i>	Duck weed	Floating	North America
<i>Limnobium Spongia</i>	American frogbit	Floating	North America
<i>Limncharis Humboldtii</i>	Water poppy	Floating	South America
<i>Ludwigia Mulerttii</i>	Water purslane	Floating	Amazon River
<i>Myriophyllum proserpinacoides</i>	Parrot's feather	Floating	Tropics
<i>Nuphar sagittaeifolium</i>	Spatter-dock	Submerged or above water	North America
<i>Pistia Stratiotes</i>	Water lettuce	Floating	Tropics
<i>Salvinia natans</i>	Floating gem	Floating	Tropics
<i>Potamogeton crispus</i>	Pond- weed	Submerged	Europe
<i>Sagittaria subulata</i>	Ribbon arrowhead	Submerged or above water	North America
<i>Trapa natans</i>	Water chestnut	Floating	China
<i>Utricularia vulgaris var. americana</i>	Bladderwort	Submerged	North America
<i>Vallisneria spiralis</i>	Eel-grass	Submerged	North America

FISH TO BE FOUND IN AQUARIA

Among the curious fish from foreign lands will be seen the *Mollinesia latipinna*, or sail fish, with its huge, brilliantly colored dorsal fin which it expands like a sail when courting. These fish are natives of the bayous and small streams of the Gulf and particularly of Louisiana and Mexico.

The Mexican sword-tailed fish will be found in another tank, where it is readily distinguished by its long saber-like tail. The colors of this fish baffle description.

The South American peacock-fish, one of the smallest known fish, while called the "millionfish" in its native waters on account of its vast numbers, is shown here in a small family, as, like the two above-named fishes, it is tropical in nature and requires much heat during the winter. It shows all colors of the rainbow and is covered with dots exactly like the eyes of the peacock's tail.

Another rare South American fish, the danio or zebra fish, resembling a miniature striped bass, will be found in several forms. It is incessantly active and scarcely ever stops for breath, taking its food in quick, snappy darts.

The paradise fish is another interesting variety, one of the earliest known aquarium fish. Its brothers, the fighting fish of Siam (*Betta pugnax* and *Betta rubra*), will be found near it. These latter fish are used for fighting by the Siamese, great fortunes and estates or women changing hands on the results of these singular battles. These fish are desperately pugnacious and will fight until one or the other is literally torn to pieces. The negro fish, the stilt fish, the ruby fish, and the albino fish will also be found in this collection. In another alcove will be found the sacred blue carp of Japan and the sacred red carp of the same country.

The East Indian and Japanese shubunkin, or brocaded goldfish, will be found in an alcove where are displayed Japanese lion-headed goldfish, Korean eggfish, Chinese moor

(black) dragon-eyed goldfish, and the more beautiful forms of goldfish, such as butterfly-tails, lace-tails, fan-tails, and comet-tails, scaled and unsealed, in colors from gold to blue and mottled calicoes.

Among the wild native fish will be seen the rainbow darters, the sculpin or toad-fish, the various minnows and horn-pout, the red and common sunfish, the purple minnow, the rainbow dace, the striped dace, the common shiner, and the darters or top-water minnows with their wonderful checkerboard colors.

AQUARIUM MANAGEMENT

The chief sources of failure in the management of aquaria are overcrowding, overfeeding, sudden temperature changes, lack of proper plant life, and insufficient lighting.

The tendency to overcrowd aquaria is a common fault. A safe rule to follow is to allow one gallon of water to every one-inch fish; thus a ten-gallon aquarium may contain ten one-inch fish or two five-inch fish. When the fish continually come to the top and gasp for air it is a sign either of overcrowding or of the presence of some decomposed matter in the water.

Overfeeding of fish is an evil usually due to ignorance. Under natural conditions, in order to procure food, fish have to exert themselves, but as such exercise is not possible in a confined aquarium, food must be given in smaller amounts. No more should be given than can be consumed at once, and if any remains after five minutes it should be removed with a dip tube. When the temperature of the water is 60° F. or higher, daily feeding is permissible, but as the temperature goes down feeding should be reduced to two- or three-day intervals.

If change of water becomes necessary, sudden fluctuation of temperature should be avoided, as it is quite



often the primary cause of disease. Every few days a tenth of the volume of water may be changed slowly. A sprinkling pot is desirable for adding water, the small streams becoming well aerated.

An evidence of sickness in fish is the dragging of the back fin which normally is carried upright. The movements also become sluggish and a tendency to hide in a dark corner is noticed. The body becomes thin, the fins split and are streaked with red, and the excrement shows a pale color. Sick fish should be removed quickly from the aquarium, and if the disease affecting it be contagious, the tank should be disinfected by adding three grains of potassium permanganate to a gallon of water, having previously removed the fish and the snails.

The mineral constituents of the water are absorbed by the fish and plants to such an extent as to necessitate addition of these materials at intervals. A mixture of three parts of evaporated sea salt to one part of Epsom salts added at the rate of one teaspoonful to twenty gallons of water every two weeks will prove beneficial. Acid conditions resulting in the crumbling of the shells of snails may be eliminated by keeping a piece of plaster of Paris or gypsum in the aquarium. In dissolving, it neutralizes the acid, but as it only dissolves under acid conditions there is no danger of the water becoming too alkaline.

In order to get rid of a good deal of decomposing matter in the aquarium, Japanese, African, and European red snails, as well as water mussels and weather-fish, are extremely

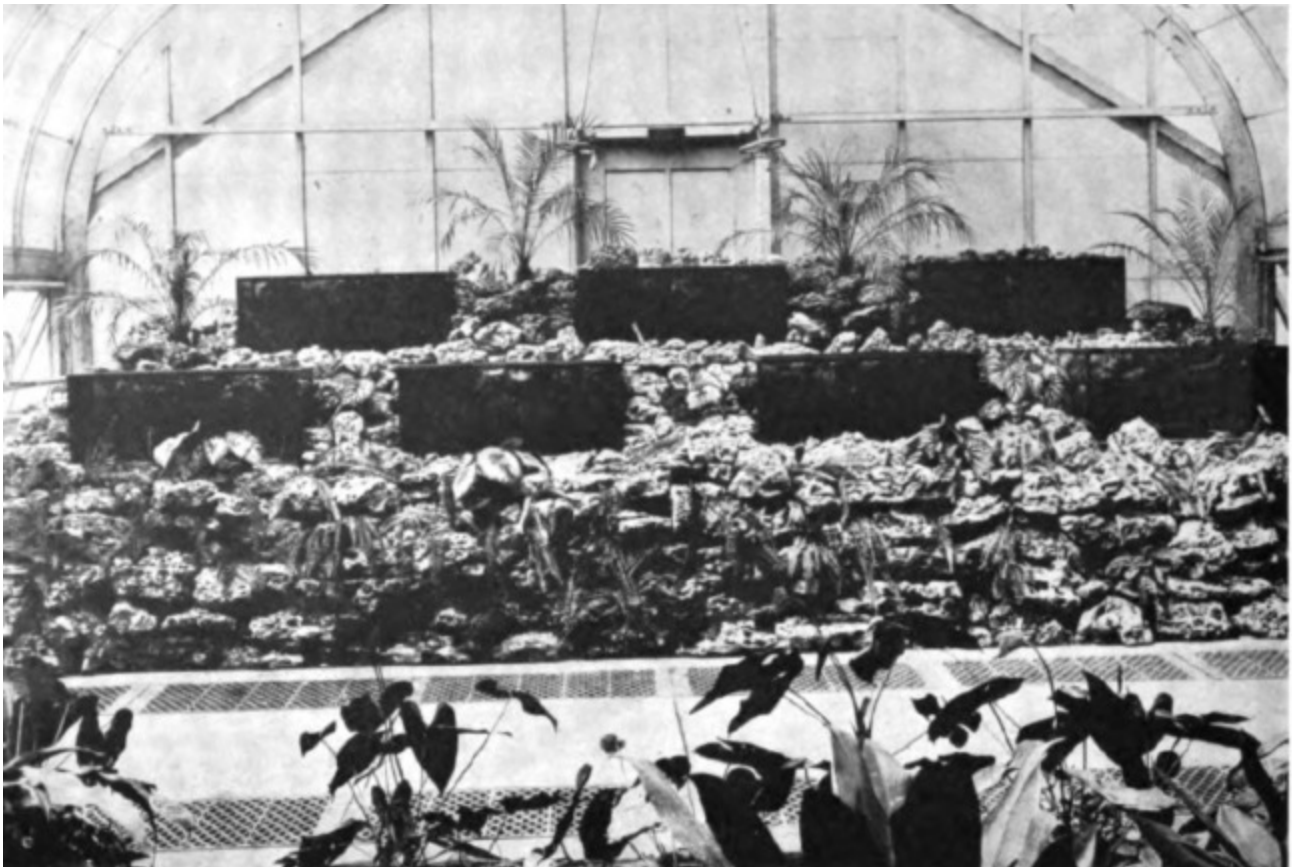
useful and should find place in every tank. The mussels are necessary for keeping down algal growth.

Planting is done directly in sand which is spread to a thickness of one inch. Two inches of water is then added, the roots spread out, and another one-inch layer of sand and pebbles placed on top. The aquarium should be allowed to stand at least a day before the fish, are added.

A globe is one of the worst possible containers for fish. When filled the air surface is small in proportion to the water bulk; the convex surface of the globe acts as a lens, focusing light into the eyes of the fish ; proper plant growth is difficult, and in addition overcrowding and overfeeding are apt to result.

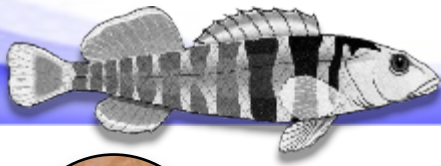
2020 ANNUAL REPORT OF THE DIRECTOR referring to 1919

Aquaria and Collection of Fish.—The alcoves of the aroid house, formerly devoted to the exhibition of orchids, have been adapted for a display of fancy fish. Some 35 aquaria, with an appropriate setting, have been established here, and, through the cooperation of the St. Louis Aquarium Society, a most interesting lot of fish—mostly tropical—are now on display. An opportunity is likewise afforded of including practically all of the aquatic plants suitable for aquaria, and there are now to be found here about 30 varieties of plants, growing either completely or partially submerged, such as it is not ordinarily possible to show in a garden.



AROID HOUSE WITH ONE OF THE ALCOVES SHOWING AQUARIA





BAP Summary

Since we have not had monthly meetings lately there will not be a monthly BAP report in this Darter issue. So I have put together a list of the all-time BAP standings.

Our first BAP records are from 1971 and this marks the 50th year of the program. I have included past member totals of 100 points or more and all current members are highlighted.

Interestingly, the top six and eight of the top nine point scorers are current members, which shows the strength of our current program. So take a look at where you stand on the list and look a spot or two higher and set a goal to move up the list.

A couple of you just need an article to receive your next higher award. One of the few benefits of staying home during these times is that we now have plenty of time to write an article, do those water changes and condition the next pair of fish we want to spawn.

Rank	Breeder	Active	Points
1	Mike Hellweg	(86-20)	7320
2	Pat Tosie	(82-20)	6302
3	Cory Koch	(05-17)	4354
4	Derek Walker	(96-16)	3640
5	Jerry Jost	(05-19)	3357
6	Rick Tinklenberg	(01-19)	3245
7	Jim Miller	(82-16)	3144
8	Charles Harrison	(83-20)	2930
9	Mike Huber	(90-20)	2847
10	Peggy Scott	(79-98)	2727
11	Gary Lange	(83-17)	1979
12	Reet Thomas	(80-01)	1891
13	Chuck Bremer	(14-19)	1412
14	Debbie Sultan & Tom Corradini	(12-19)	1350
15T	Ralph Wilhelm	(74-97)	1236
15T	Gary McIlvaine	(05-11)	1236
17	Holly Paoni & Kevin Wise	(13-20)	1097
18	Ed Millinger	(87-19)	1066
19	Mark & Tammy Langer	(06-08)	837
20	Barb & Eric Miller	(86-88)	824

Rank	Breeder	Active	Points
21T	Harold Walker	(96-11)	815
21T	Nick Scarlatis	(11-15)	815
23	Jack Heller	(98-19)	770
24	Kurt Zahringer	(09-18)	720
25	Kathy Daly	(93-19)	693
26	Jim Thale	(71-01)	681
27	Warren Scott	(84-89)	585
28	Rich Crabtree	(74-93)	516
29	Blenda Godman	(88-93)	481
30	Gerry Ketts	(81-89)	451
31	Bruce Mayhew	(93-19)	438
32	Ray Fischer	(86-89)	435
33	Bob & Lora Watson	(17-20)	420
34	Noel Roberts	(85-99)	418
35	Jim Mueller	(80-93)	413
36	Larry Akers	(91-92)	402
37	Rich Grayer	(80-87)	398
38	Chris Mohrle	(15-19)	396
39	Rick Winkler	(92-03)	390
40	Peter McPhee	(93-96)	349
41	Jim Gremel	(71-71)	342
42	John Stollhans	(09-16)	335
43	Larry & Pam Stolte	(82-85)	332



Rank	Breeder	Active	Points
44	John Van Asch	(83-19)	315
45	Scot Roach	(16-18)	314
46	Dan Rios	(16-18)	305
47	Caleb Pitman	(18-19)	302
48	Jim & Rosemary Yaekel	(91-03)	284
49T	Carl Toenges	(85-93)	280
49T	Steve Edie	(02-19)	280
51	Terry Reed	(87-89)	261
52	Randy Ison	(97-03)	255
53	Charles & Mary Ann Lenau	(88-05)	240
54	Fred & Sue Cotterel	(87-90)	238
55T	Daniel Hoermann	(83-87)	235
55T	Dennis Merlotti	(86-87)	235
57	John Beck	(86-97)	232
58	Bob Reich	(87-91)	224
59T	Dennis Heltzel	(91-94)	220
59T	Don Atkinson	(05-13)	220
59T	Steven Hoffman	(03-19)	220
62T	Lester Maull	(71-71)	205
62T	Charlotte Furtwengler	(82-03)	205
64	Craig Henning	(87-89)	204
65	Mary Viviano	(91-97)	193
66	Richard Kelley	(86-88)	191
67T	Ed Higgins	(96-98)	190
67T	Andy White	(11-17)	190
69T	Joseph Schrader	(85-90)	185
69T	Jack & Michelle Berhorst	(92-07)	185
71T	Marlon Felman	(06-13)	180
71T	Evan Wright	(13-15)	180
73T	Alvin Rabinowitz	(71-71)	177
73T	Guy Tinker	(16-19)	177
75	Lawrence Kent	(05-07)	175
76	Robert Huels	(89-90)	173
77	Jim Welky	(71-71)	165
78	Tony McMillan	(91-14)	164
79T	Curtis Skouby	(86-92)	160
79T	Jim Lovins	(88-91)	160
79	Eric Beger	(13-13)	160
82T	Steve & Sara Boyd	(81-84)	155
82T	Philip Newell	(06-09)	155
84	Jim & Susan Brodack	(89-96)	151
85T	Mike & Sherry Taylor	(88-90)	150

Rank	Breeder	Active	Points
85T	Patrick Tosie	(92-04)	150
85T	John Hittler	(93-94)	150
88	Charlotte Hopfinger	(71-71)	147
89	Chad Christensen	(97-98)	145
90	Charles Zesch	(89-90)	141
91	John Allen	(88-03)	140
92	Todd Powers	(14-15)	137
93	Jim Tainter	(85-91)	135
94T	Charles Hoppe	(86-16)	132
94T	Mike Slater	(16-20)	132
96	Mike & Joe Raymond	(94-03)	130
97	Jeffrey Birch	(86-89)	129
98	Steve & Kathy Deutsch	(93-96)	125
99	Kathy Tosie	(84-90)	121
100T	Pat Floyd	(88-89)	120
100T	Ted Rall	(94-96)	120
100T	Chuck Dyn	(97-01)	120
100T	Diane Brown	(03-07)	120
104T	Hank Roth	(71-71)	117
104T	Alfred Anderson	(71-96)	117
106	Justin Lehmann	(07-14)	115
107	Henry Phelps	(81-81)	110
108	Kevin Estes	(94-03)	105
109	Warren Crabtree	(90-91)	102
110	Ralph Hueneberg	(96-03)	100
135 non-current members not shown in this portion	Dwayne Peters	(07-16)	99
	Rick Smith	(04-09)	95
	Sue Egan	(96-97)	40
	Jake Harris	(19-20)	40
	David Bell	(19-19)	35
	Larry Albright	(91-91)	30
	Daniell Kinder	(17-17)	30
	Melanie Holmes	(18-19)	30
	Bill Perkins	(10-10)	22
	Jeff Keim	(17-17)	20
	Bob Buckles	(01-03)	15
	Steve Coxon	(20-20)	15
	Klaus Bertich	(75-75)	10
	Travis Irvin	(19-19)	10
	Brad Riley	(19-19)	10
Jim & Sue Amsden	(06-06)	5	
Ryan Bush	(11-11)	5	
PJ Stull	(19-19)	5	
Brian Woodrick	(20-20)	5	





HAP Summary

I have also put together a list of the all-time HAP standings.

Our first HAP records are from January 1992 so this marks only the 28th year of the program. I have included past member totals of 100 points or more. All current members are highlighted.

Interestingly, eight of the top ten point scorers are current members. Take a look at where you stand and set a goal to move up the list.

Several only need articles to receive the next higher award level, the points are already “in the bank”. Leverage time at home into time writing articles and setting up a set of outdoor ponds. Since the HAP program accepts photos of blooms and paperwork that can be submitted electronically you can still gain points without attending a meeting during this period.

Rank	Horticulturist	Points
1	Mike Hellweg	3760
2	Derek Walker	3270
3	Gary Lange	1880
4	Holly Paoni & Kevin Wise	1785
5	Jerry Jost	1630
6	Maureen Green	1305
7	Chuck Bremer	1285
8	Ray Schlund	1275
9	Harold Walker	1220
10	Noel Roberts	815
11	Charles Harrison	800
12	John Van Asch	795
13	Jim & Brenda Thale	765
14	Andy Walker	690
15	Micky Lee	635
16	Chris Mohrle	550
17	Mike Huber	535
18	Pat Tosie	445
19	Tony McMillan	425
20T	Evan Wright	375
20T	Jim Yaekel	375
22	Ed Millinger	370
23	James H. Miller	355
24	Marc & Kathy Daly	340
25T	Diane Brown	305
25T	Charles & Mary Ann Lenau	305

Rank	Horticulturist	Points
27	Bruce Mayhew	295
28	Chris London	285
29	Mary Viviano	260
30	John Beck	245
31	Matt Ormsby	240
32	Jim Mueller	210
33	Dwayne Peters	180
34T	Charles Hoppe	175
34T	Daniell Kinder	175
36	Tom Schnur	170
37	Charles LaRocca	160
38T	Nick Scarlatis	145
38T	Ryan Bush	145
40	Jack Berhorst	135
41	Marlon Felman	130
42T	Jim & Susan Brodack	125
42T	Scott Hancock	125
44T	Philip Newell	120
44T	Debbie Sultan & Tom Corradini	120
44T	Dennis Heltzel	120
47	Joe Schraeder	115
48T	Angela Bohn	110
48T	Brian Woodrick	110
50T	Cory Koch	100
50T	Steve & Kathy Deutsch	100

Rank	Horticulturist	Points
	Kurt Zahringer	85
	Jake Harris	45
	Brad Riley	30
	Steve Coxon	30
	Jack Heller	25
	River Kinder-Russell	25
	Laura Morrison	20
	Randy Ison	20
	Robby Simmons	20
	Kevin Wise	15
	Rick Smith	15
	Rick Tinklenberg	15
	Melanie Holmes	10
	Scott Bush	10
	Travis Irwin	10
	Scot Roach	10
	Christina Jones	5

29 non-current members omitted from this portion



HORTICULTURE AWARD PROGRAM - Mike Hellweg

March & April 2020

Points Rewarded!



Member	Genus & Species	Common Name	Type	Points
Noel Roberts	810 points			
	<i>Echinodorus bleheri</i>	Bleher's Amazon Sword	V	15
	<i>Vallisneria americana</i>		V	5
Chuck Bremer	1280 points			
	<i>Cryptocoryne beckettii</i>	Petch's Water Trumpet	IB	20
Mike Huber	535 points			
	<i>Anemopsis californica</i>	Yerba Mansa	OB	10
	<i>Iris laevigata</i> Snowdrift	Snowdrift Water Iris	OB	10*

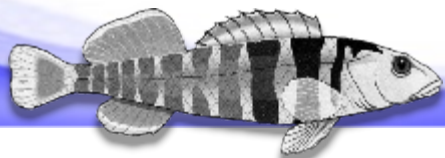
HAP Key: Reproduction Key: V = Vegetative, OB = Outdoor Bloom, IB = Indoor Bloom, S = Seedling; * MASI First!

It's that Time of Year Again!



Editor's note: Since HAP blooms require an emailed photo and not a sale to confirm, the HAP program can continue even without Face-2-Face meetings. Click the scroll for the paperwork.





MEMBER CLASSIFIEDS

Member	For Sale	Bid/Asked	Contact
Charles Harrison	Thiosulfate crystals (Chlorine Remover) - pound	\$4.00	(314) 849-9761
	OTO double strength Chlorine/Chloramine test kits - 4 ounce	\$12.50	charles@inkmkr.com
	Flubendazole, 10% powder 25 grams	\$20.00	
	Lavamisole HCl Powder - 5 grams treats 100 gallons	\$10.00	
	Methylene Blue 5% solution (4 ounces)	\$12.75	
	Acriflavine Concentrate (4%) solution, 2 ounces	\$12.70	
	Bromthymol Blue pH test solution, 4 ounces	\$7.00	
Charles Hoppe	Several 10 and 15 gallon tanks, including wooden rack. The stand is steel and it holds 12 ten gallon tanks. It has fluorescent lights and air valves for the 12 tanks. Makes a nice small fishroom. Extras, contact me if interested.		(314) 846-4648 charliehoppe@me.com
Mike Hellweg MiniFins	General Aquarium Support: Dechlor, Coconut Caves, Flake Foods, Plants & Custom Fish Orders Contact by email or buy at the back of the room at MASI General meetings	Contact for Pricing	Email: Mike@Minifins.com

Got \$\$\$\$ swimming in those Tanks?

MASI Members of good standing can place a fish related classified ad in the Darter for free. Send your ads to the editor. Deadline is 10 days prior to the January, March, May, July, September or November MASI Meeting. The Darter is Emailed about 3 days prior to each meeting.

Changing Constantly on: BAND.us/@MASIclub & BAND.us/@MASIswap!

In Search Of	AVAILABLE	CHECK HERE:
Albino LF blue Eye Male Pleco	Various Apistos	MASI Swap BAND
Tank cover & Light	Mosses, Marsilea minuta, etc.	MASI Swap BAND
Lamprologus sp.	L24 & L273's	MASI Swap BAND
Cherry, Tiger or Roseline Barbs	Royal Panaque L-190	MASI Swap BAND
Juvenile Flowerhorns	Male Brown Bristlenose	MASI Swap BAND
Buffalo Head Cichlids	Cherry Shrimp	MASI Swap BAND
Platys	150 Gallon Tank w fixins	MASI Swap BAND
Green Swordtails	130 Gallon Tank w fixins & Fish	MASI Swap BAND
Fancy Guppies	Desktop Rimless Nano Tank	MASI Swap BAND
Honey Gouramis	Breeding Pair of Angelfish	MASI Swap BAND
Green Terror Cichlids	Cobra Guppies	MASI Swap BAND
Peacock Bass	Mystery Snails	MASI Swap BAND
Corydoras	Salvinia	MASI Swap BAND

During COVID the MASI Swap group on BAND has become a Prime Shop. Check it Out!



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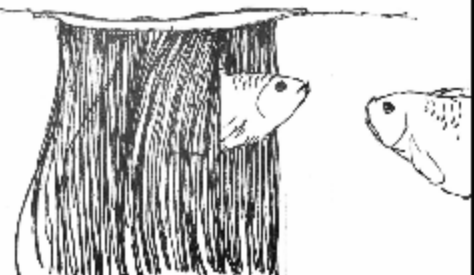
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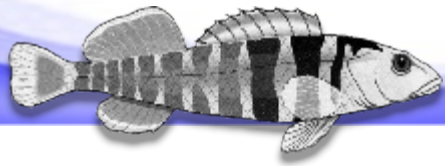
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