

modern AQUARIUM



December 2023
volume XXX
number 10

Greater City Aquarium Society - New York

長江水族館

專營各國熱帶觀賞魚和全套優質水族器材



131-08 40th Road, Flushing

Skyview Mall 天景豪苑旁

347.732.0373

monsteraquarium@hotmail.com



歡迎參觀 七天營業

Open 7 Days • 10am-8pm



LIKE AND FOLLOW US ON FACEBOOK

WWW.FACEBOOK.COM/MONSTERAQUARIUMINC

modern AQUARIUM

Series III Vol. XXX, No. 10 December, 2023

ON THE COVER

Our cover photo this month is from our Fishy Friends Photos Facebook page, and reminds us once again that fish aren't the only thing that we aquarists think about. The photo is by GCAS member Lonnie Goldman.

GREATER CITY AQUARIUM SOCIETY

BOARD MEMBERS

President.....Horst Gerber
Vice-President.....Edward Vukich
Treasurer.....Leonard Ramroop
Assistant Treasurer.....Open
Secretary.....Open
President Emeritus.....Joseph Ferdenzi

MEMBERS AT LARGE

Pete D'Orio.....Al Grusell
Jason Kerner.....Dan Radebaugh
Marsha Radebaugh

COMMITTEE CHAIRS

Bowl Show.....Joseph F. Gurrado
Breeder Award.....Harry Faustmann
Early Arrivals.....Al Grusell
Membership.....Marsha Radebaugh
N.E.C. Delegate.....Joseph Ferdednzi
Programs.....Open
Social Media.....Gilberto Soriano
Technical Coordinator.....Jason Kerner

MODERN AQUARIUM

Editor in Chief.....Dan Radebaugh

Copy Editors:

Susan Priest

Donna Sosna Sica.....Thomas Warns

Advertising Manager.....Robert Kolsky

See us on the Web:



In This Issue

From The Editor.....	2
G.C.A.S. 2023 Program Schedule.....	3
President's Message.....	4
Our Generous Sponsors and Advertisers.....	5
Fishy Friends' Photos.....	6
October's Cartoon Caption Winner.....	7
Cartoon Caption Contest..... by Denver Lettman	8
Pictures From Our Last Meeting..... Photos by Marsha Radebaugh	9
November Bowl Show & Door Prize Winners..... Photos by Marsha Radebaugh	10
The Amazon Is Dying!..... by Jules Birnbaum	11
Goldfish Driving Cars & Navigation..... by Maria Temming	13
Why Hobbyists Should Write For Their Club Journal.....	15
MA Classics..... by Wayne Leibel	17
Bowl Show Rules.....	18
The Secret of the Underwater Mystery Clock..... MA Classics..... by Joseph Ferdenzi	18
The Chocolate Cichlid..... <i>Hypselecara temporalis</i> MA Classics..... by Dan Radebaugh	17
G.C.A.S. Member Discounts.....	24
Modern Aquarium Covers 2019..... MA Classics.....	26
The Undergravel Reporter..... Remarkable Longevity of BuffaloFish in Arizona	27
Fun Fish..... MA Classics..... by Bernard Harrigan	28

From the Editor

by Dan Radebaugh

One of the things I've enjoyed over my years with the GCAS has been the things I've learned—not just about this or that fish, but about the dedication and determination shown by our members and speakers to “do the right thing” for the creatures with whom we share our lives and homes.

We don't always agree when it comes to specifics—you might like livebearers, while someone else might prefer bubble-nesters or tough guys or fish that are somehow ‘different’ in some perhaps strange way.

I've found that our members are here because they want to be around others who share their fascination with these underwater creatures who seem to become our friends—or at least acquaintances (and certainly dependents) in their own way. While it may or may not be our immediate intention to

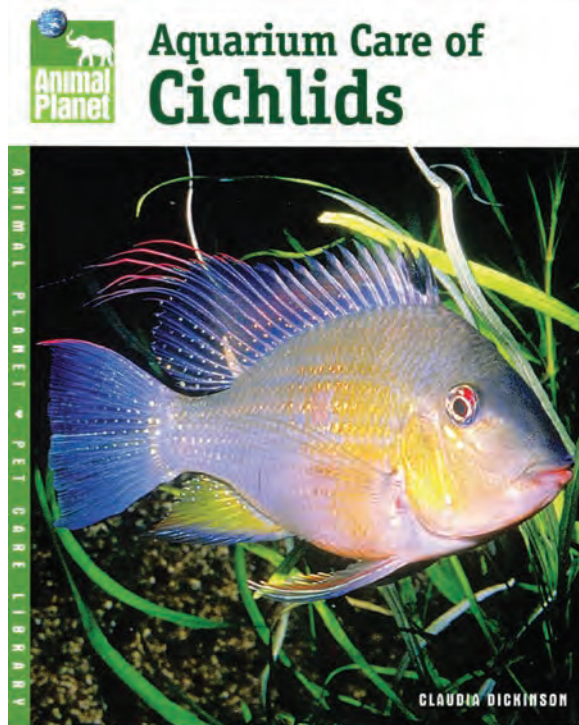


learn from (or teach) our fellow members, the fact is that we do both of those things, mostly without even trying.

Many years ago I read that Ian Fleming once asked his rich uncle something like, “How did you become so successful?” The uncle's answer was, “Lairn to say no, Laddie, lairn to say no!” Well, at times I'm sure that's good advice. But I suspect that it's probably just as important to know when to say yes.

So if you find that you like coming to our meetings and seeing what our members are up to, take the plunge! Write about what you do! What kind of fish do you keep? Why do you like keeping them? What have you learned from keeping them? What have been the challenges? How did you overcome them? What have you learned from working with your fish that surprised you?

Remember—none of us knows everything! Some detail that you have somehow picked up along the way might be just the thing that someone else in the club would really benefit from learning! Remember the show (and movie) **South Pacific**? Well, don't be a Stingy B*t*rd! Share what you've learned! We all want to know!



by Greater City member Claudia Dickinson
(Animal Planet® Pet Care Library)

Hardcover – Also available on Amazon Kindle
<https://www.amazon.com/Aquarium-Cichlids-Animal-Planet-Library/dp/0793837774>



GCAS Programs

2023

March 1	Tom Keegan <i>Fish Biology 101, Part 1</i>
April 6	David Banks <i>Lake Tanganyika Cichlids and Appropriate Tankmates</i>
May 3	Emiliano Spada <i>Antique Aquariums and Equipment</i>
June 7	Karen Randall <i>Sunken Gardens</i>
July 5	Dr. Paul Loiselle <i>The World of Jewel Cichlids</i>
August 2	Night At the Auction
September 6	Sebastian Alvarado <i>Color Changes In Fish</i>
October 4	William Guo <i>Freshwater Shrimp</i>
November 1	Tom Keegan <i>Fish Biology 101, Part 2</i>
December 6	Holiday Party!

Articles submitted for consideration in **Modern Aquarium** (ISSN 2150-0940) must be received no later than the 10th day of the month prior to the month of publication. Please email submissions to gcas@earthlink.net, or fax to (347) 379-4984. Copyright 2023 by the Greater City Aquarium Society Inc., a not-for-profit New York State corporation. All rights reserved. Not-for-profit aquarium societies are hereby granted permission to reproduce articles and illustrations from this publication, **unless the article indicates that the copyrights have been retained by the author**, and provided reprints indicate source, and that a copy of the publication is sent to the Exchange Editor of this magazine). Copies may be sent via email to gcas@earthlink.net. Any other reproduction or commercial use of the material in this publication is prohibited without prior express written permission.

The Greater City Aquarium Society meets every month except January and February. Members receive notice of meetings by email and/or via Facebook. For more information, contact Dan Radebaugh at (718) 458-8437, email to gcas@earthlink.net, or fax to (347) 379-4984. For more information about our club or to see previous issues of **Modern Aquarium**, you can also go to our Internet Home Page at <http://www.greatercity.net>, <http://www.greatercity.org>, or <http://www.greatercity.com>.

President's Message

by Horst Gerber

It's Friday night at 12:30 AM, one of those nights when I have problems going back to sleep. Too much going through my mind, including the song, "Midnight at the Oasis!" Putting your camels to sleep is easier said than done again and again and again. It's like counting sheep, or "Hey Diddle Diddle, the Moon is in the Middle!" Bacardi Gold is working... No, resistant! 3 AM. No—maybe two shots will do it. Shape doesn't matter within government. Finally admitting when you read this another year is almost gone!



The year 2023 in retrospect reminds me of the TV show **Gilligan's Island**. A three hour boat tour on the Minnow turned out to be a disaster! The crew and passengers wound up on Gilligan's Island for years! A three hour tour? They certainly got their money's worth! If you don't know that TV show don't worry—I'm showing my age. The show sounds familiar to me because the original term agreement was three years for me to be President. By the time you read this another year will be almost gone! Eight years later we are still alive and kicking—or at least flapping like a fish out of water!

We weathered the Pandemic, and had our Centennial Gala Party. That was a great success that few clubs if any can brag about! Even with all the Covid 19 problems our monthly meeting attendance has been very good, our treasury is stable (thanks to all of you!), and our auctions are going strong with quality and bargains galore! As our attendance has grown back post-pandemic, we need some assistants in almost every important position. If you think you can help out, let us (me) know. You might be surprised by how good you are at it. So chip in!

I got a lot of compliments on my President's Message last month. I must have been on opioids or something! Wait! I *am* on opioids! I'm having a problem with sciatic nerve. Looks like I'll have to live with it, as I'm not ready for an operation right now. So our Prez from way back when re-surfaced, and after I begged and pleaded, agreed to take over running the meeting. He has a much better mouthpiece than mine, and his voice travels better!

Nothing exciting is going on in my fishroom currently. I'm breeding three species, *Tetra kevia*, *Julidochromis ornatus*, and *Aphyosemion australe*. That's enough for right now. Recently someone offered me a two-year old 150 gallon bow-front tank, and how can you resist? Right now it's sitting empty in my garage until I build a new stand. That's why some folks started calling me a hoarder. I'm a wood butcher by trade (cabinet maker), and when I looked at the construction of that stand, for the life of me I could not understand how it had held up that tank with water in it. It barely holds up the tank when it's empty! So when you buy tanks be sure they have sturdy stands!

Horst





GCAS Thanks You!

Our Generous Sponsors and Advertisers

The Greater City Aquarium Society extends our heartfelt thanks to the following manufacturers for their generous donations. Thanks also to our advertisers, whose contributions to our success as a Society are deeply appreciated. Please patronize our supporters.

Advanced Marine Aquatics

Al's Aquatic Services, Inc.

Amazonas Magazine

Aquarium Pharmaceuticals

Aquarium Technology Inc.

Aqueon

Brine Shrimp Direct

Carib Sea

Cobalt Aquatics

Coralife

Ecological Laboratories

Fishworld

Florida Aquatic Nurseries

Franklin Pet Center Inc

Fritz Aquatics

HBH Pet Products

High Quality Exotic Goldfish

Hydor USA

Jehmco

Jungle Bob Enterprises

Jungle Labs

Kent Marine

KHC Aquarium

Kissena Aquarium

Marineland

Microbe Lift

ModernAquarium.com

Monster Aquarium, Inc.

Nature's Reef & Reptile

NorthFin Premium Fish Food

Ocean Nutrition America

Oceanic

Omega Sea

Pacific Aquarium, Inc.

Penn Plax

Pets Warehouse

Pet Resources

Pisces Pro

Red Sea

Rena

Rolf C. Hagen

San Francisco Bay Brand

Seachem

Sera

Spectrum Brands

Your Fish Stuff.com

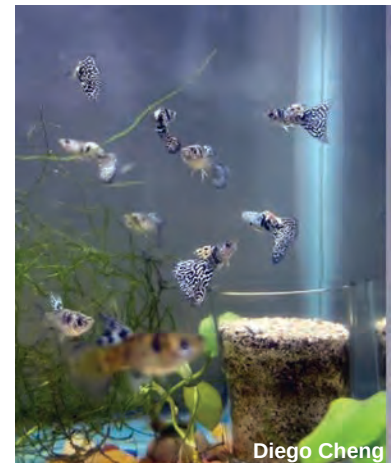
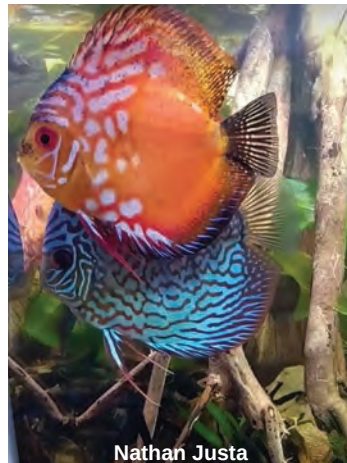
Zilla

Zoo Med Laboratories Inc.

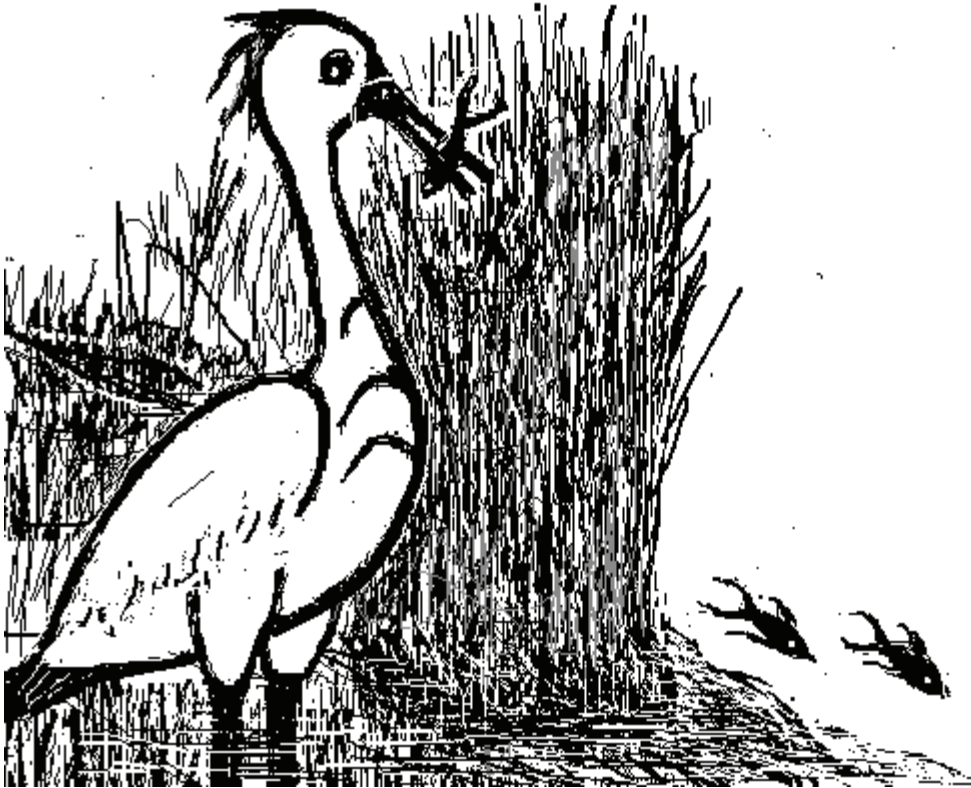
Fishy Friends' Photos

by Greater City Aquarium Society Fishy Friends

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



November's Caption Winner: **Brenda Prohaska**



Swim, Forest! Swim!



The Modern Aquarium Cartoon Caption Contest

by Denver Lettman

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



Your Caption:

Your Name:



<https://www.amazonasmagazine.com/>

Pictures From Our Last Meeting

Photos by Leonard Ramroop*



Our Speaker this evening, Tom Keegan



Marsha & Dan Radebaugh (seated). Looks like Marsha's working harder.



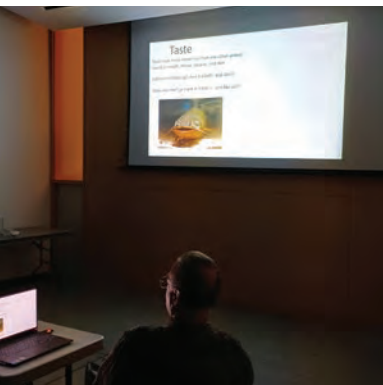
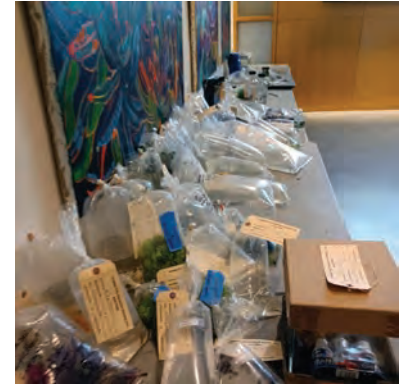
Florence and Veronica
*Photo by Marsha Radebaugh



Great to see Jeff Bollbach back with us again!



Getting all the auction goodies set up and ready to go.



The shadowy image of Jason Kerner as he makes our speaker's images appear magically before us.



The audience is rapt as Tom Keegan gives his presentation on how smart our fish really are!



Everyone relaxes after a great presentation!



November Bowl Show Winners!

1. Joseph Ferdenzi -- *X montezuma*
2. Richie Waizman -- Red & Blue Betta
3. Richie Waizman -- Red & White Betta



November Door Prize Winners!



Lawrence Surace (left)



Dan Puleo (right)

Photos by Marsha Radebaugh

The Amazon Is Dying!

by Jules Birnbaum

A brief history of the Amazon river: 15 million years ago, a massive freshwater lake covered the Amazon basin. During the several ice ages that followed, water started to flow eastward from the Andes in Peru, sea levels fell, the lake started to drain out to the ocean, and the Amazon River was born. The river was discovered in 1541 by the Spanish.

The Amazon is the largest river in the world in volume. It is home to the Amazon River Dolphin (*Inia geoffrensis*) and Dorado catfish (*Brachyplatystoma rousseauxii*). The river with all its tributaries contains 20 percent of the world's flowing water. It contains a third of all known terrestrial plant and insect species.

The expansive Amazon rainforest is perhaps the most iconic and well-known of the world's wild lands. It is a lush tropical landscape that is not just one rainforest, but in fact home to half of the world's tropical forests, in addition to being the largest river system on Earth. Extending across all or part of eight countries (Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela, and the French overseas department of French Guiana), Amazonia is one of the world's five designated High-Biodiversity Wilderness Areas.

This irreplaceable place is also critically important to approximately 20 million indigenous peoples from more than 350 indigenous groups, several of which still live in voluntary isolation from the outside world. These 20 million people depend on natural ecosystems and resources for their livelihoods and culture, and have traditionally lived in harmony with their natural environments for generations.

The Amazon is now in trouble. There is a powerful drought hitting the area,

which is made worse by global warming and deforestation. This has caused large wildfires. In the next few weeks the rainy season is due to start, which might bring some help.

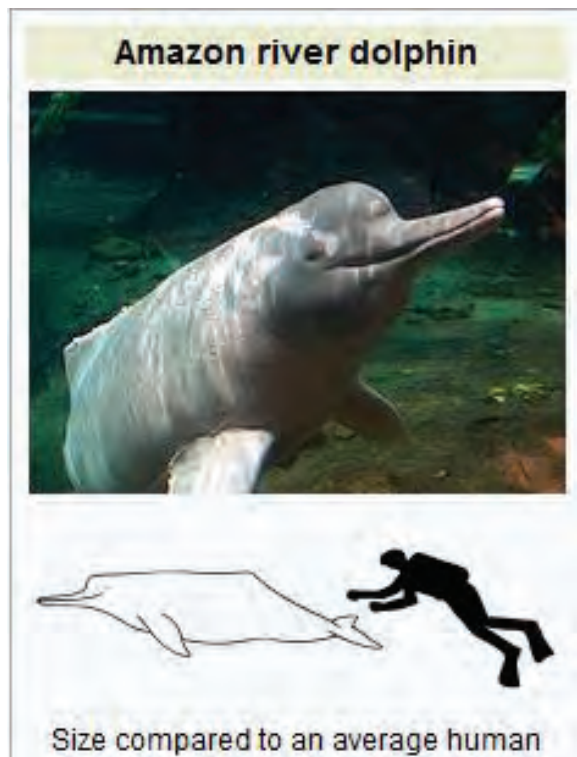
Wildlife is being stressed. Water temperatures are high, and 153 River Dolphins have died since the first carcasses were discovered. A toxic algae bloom is now in Lake Tete. Low river levels during this severe drought have heated water in stretches to temperatures that are intolerable for many fish. Thousands of fish have died recently in Amazon rivers due to a lack of oxygen in the water. The fires burning through the Brazilian Amazon are also a threat to the fish that rely on forest flooding to survive, raising fears that the fish will be lost.



Dorado Catfish
Brachyplatystoma rousseauxii
Photo from Zierfische Berlin

Significant links between forest cover and fish abundance were found for many of the Amazon's most popular food fish, including the highly prized tambaqui, which can grow up to 70 pounds and has specialized teeth that can crush and grind hard fruits and nuts. Strong connections were also found for carnivorous species, such as the dorado catfish and the surubim, which feed on schools of fish that live in the flooded forest.

What can be done to save the Amazon? Rainforest Trust is working with CEDIA to



Conservation status

Extinct Threatened Least Concern

EX EW CR **EN** VU NT LC

Endangered (IUCN 3.1)^[1]

CITES Appendix II (CITES)^[2]

Scientific classification

Domain: Eukaryota

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia

Order: Artiodactyla

Infraorder: Cetacea

Family: Iniidae

Genus: *Inia*

Species: *I. geoffrensis*

Binomial name

Inia geoffrensis

(Blainville, 1817)

create a Sierra del Divisor National Park, a White Sands National Reserve and a buffer zone of community territories on the western edge of the Sierra del Divisor.

The Rapid Rescue Fund is providing indigenous communities with the tools, resources and networks they need to secure their rights, protect their forests and rivers, govern their territories, and create thriving, resilient communities.

Finally, restore damaged ecosystems by planting trees on land where forests have been cut down, and encourage people to live in a way that doesn't harm the environment. Establish parks to protect rainforests and wildlife, and support companies that operate in ways that minimize damage to the environment.



Link 1

https://www.google.com/url?sa=i&url=http://www.euroradialyouth2016.com/south_america/Amazon_River/amazon_river.php&psig=AOvVaw0IcNOwx4LtF1RYvDawsxks&ust=1697762906374000&source=images&cd=vfe&ved=0CBAQjRxqFwoTCLD02u_xgIIDFQAAAAAdAAAAABBBQ

Link 2

https://www.google.com/url?sa=i&url=https://rainforests.mongabay.com/amazon/&psig=AOvVaw0IcNOwx4LtF1RYvDawsxks&ust=1697762906374000&source=images&cd=vfe&ved=0CBAQjRxqGAoTCLD02u_xgIIDFQAAAAAdAAAAABCfAQ

Data in left-hand column from Wikipedia



What Goldfish Driving ‘Cars’ Tells Us About Navigation

by Maria Temming



photo from Dan Radebaugh

It might seem like a fish needs a car like—well, like a fish needs a bicycle. But a new experiment suggests that fish actually make pretty good drivers.

In the experiment, several goldfish learned to drive what is essentially the opposite of a submarine — a tank of water on wheels — to destinations in a room. That these fish could maneuver on land suggests that fishes’ understanding of space and navigation is not limited to their natural environment — and perhaps has something in common with landlubber animals’ internal sense of direction, researchers report in the Feb. 15 **Behavioural Brain Research**.

Researchers at Ben-Gurion University of the Negev in Beer-Sheva, Israel taught six goldfish to steer a motorized water tank. The fishmobile was equipped with a camera that continually tracked a fish driver’s position and orientation inside the tank. Whenever the fish swam near one of the tank’s walls, facing outward, the vehicle trundled off in that direction.

Fish were schooled on how to drive during about a dozen 30-minute sessions. The researchers trained each fish to drive from the center of a small room toward a pink board on one wall by giving the fish a treat whenever it reached the wall. During their first sessions, the fish averaged about 2.5 successful trips to the target. During their final sessions, fish averaged about 17.5 successful trips. By the end of driver’s ed, the animals also took faster, more direct routes to their goal.

Some of the fish — all named after **Pride and Prejudice** characters — were speedier learners than others. “Mr. Darcy was the best,” says study co-author and neuroscientist Ronen Segev.

In further experiments, the goldfish were still able to reach the pink board when starting from random positions around the room, rather than the center. This finding confirmed that the fish had not merely memorized a choreography of movements to reach their reward, but were planning routes toward their prize each time. When the researchers tried to

trick the goldfish by placing decoy boards of different colors on the other walls or moving the pink board to the other side of the room, the fish were not fooled, and navigated to the pink board.

“That was pretty conclusive that the fish actually navigate,” says study coauthor Ohad Ben-Shahar, a computer scientist and neuroscience researcher. Recently, the team let a goldfish take a joyride throughout an entire building, Ben-Shahar says, “and it actually started to explore. It went down one of the corridors and started to sneak away.”

Behavioral neuroscientist Kelly Lambert is “not completely surprised, but still intrigued” by the driving abilities of Mr. Darcy and his fish friends. In her own research at the University of Richmond in Virginia, Lambert has taught rats to drive toy

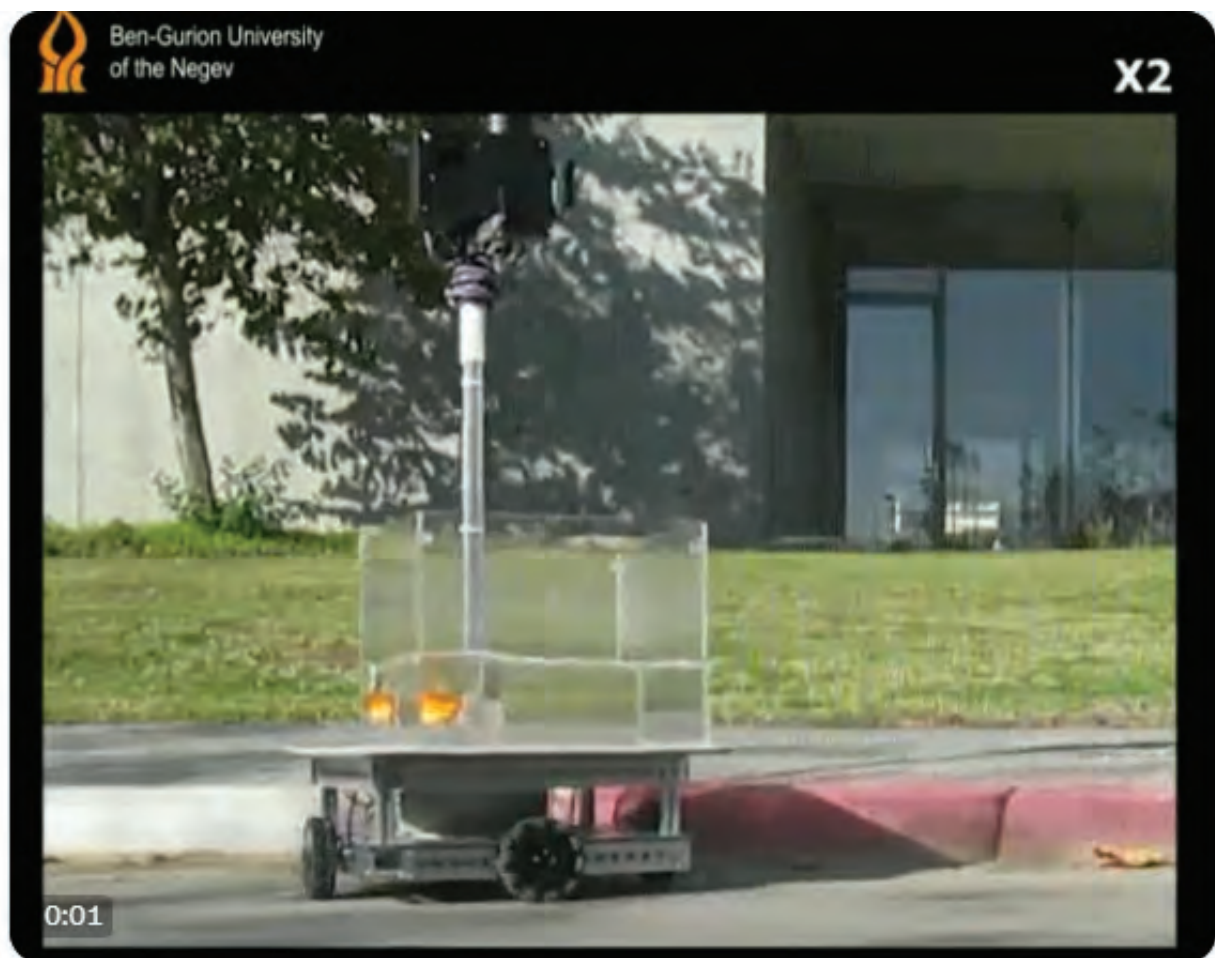
cars. But teaching goldfish to navigate such alien terrain takes animal driving experiments to the next level, Lambert says. “I love the fish-out-of-water idea.”

When it comes to testing the bounds of animal navigation, “it’s important to diversify, and expand our tasks and our species,” Lambert says. “I think we need an international race between the rats and the goldfish.”



A version of this article appeared in the February 12, 2022 issue of **Science News**.

For video of ‘fishcart’ below, see <https://twitter.com/i/status/1477889582398164994>



Why Hobbyists Should Write for their Club Journal

by Wayne S. Leibel

We stand on the shoulders of others who come before us. This is no less true of the aquarium hobby than it is for most other aspects of life. We learn by hearing of or reading about other people's experiences. In the case of the beginning aquarium hobbyist, this is usually through books or slick magazines. But once having joined an aquarium society where hobbyists of all experiences and abilities meet and exchange ideas (and fish!), our learning increases exponentially. This can happen via speakers invited to share their knowledge specifically because of their expertise in particular areas of the hobby, or better, through informal chat with other members of the club over coffee or the auction table, or, yes, through club publications like Jersey Shore's **Shoreline**.

Although my major lifelong hobby interest has been cichlids, I find nuggets of useful information in virtually every talk I have attended, be it about guppies, bettas, or even marine fishes, or in conversation with other members about some weird fish they've spawned, or fielding a question or problem they might bring me (and more often than not I don't have a clue, but learn something from discussing!), or reading an article in the club journal, be it a short BAP report about some fish I have never kept, or a longer feature article. There is always something to be learned, and it is what keeps us vital in the hobby.

A club's publication is its lifeline to the membership and its lifeblood for information exchange. In my talks to various and sundry groups I always try to give hobbyists a pep talk on how what we do as hobbyists is important. I think, as a group, tropical fish hobbyists have a collective inferiority complex. We think that our experiences in captive rearing and

spawning of fishes is unimportant—simply a 'hobby' (with all the lack of seriousness that implies), particularly relative to science. But nothing could be further from the truth! We have much to contribute. Even to that serious activity we call 'science.' Let me tell you why.



These days, the number of professional ichthyologists and other scientists actively engaged in research on fish has dwindled in favor of more molecularly oriented research. That's where the action and money is these days! Fact is, too, most professional ichthyologists are great with the dead and pickled fish they study and name, and not so good with the living critters! (Though there are some exceptions, thankfully.) Also,

with so few ichthyologists and so many fish, a lot of interesting observations just never get made. So many fish, so little time, so few professionals to do it!

Here's where we hobbyists come in. Our stock in trade as aquarium hobbyists is creating conditions that encourage our fish to spawn in captivity, where we can watch what they do at close range and learn from them. We do this for a variety of reasons: to accumulate Breeder Award points, to have young fish to sell at auction or to stores to help defray the cost of our hobby, or simply for the challenge and bragging rights of being the first to spawn some difficult or little-known, seldom-kept, or new fish. But along with these activities comes the opportunity also to observe—really observe—what our fishes do, record what they do by taking notes on the conditions we spawned them under and the behaviors we witnessed, and to share that information with other aquarists either through brief BAP reports or better, through articles published in the club bulletin (or even national slick hobby

magazine)! The information is important not just to other hobbyists who would like to learn how to spawn a particular fish, but also to science! Really!

Here's one (of several) examples of how hobbyists have contributed to ichthyology in a direct and important way. About 15 years ago, in the mid-1980s, some of us playing with South American cichlids of the genus *Geophagus* (earth eaters) noticed that one of the 'species' appearing in the hobby and sold as '*surinamensis*' differed from batch to batch. Although all 'forms' had blue and red longitudinal striping along their sides, and the same basic body shape, and all sifted sand for food, they differed in the coloration of their tail fins; some had flag stripes (alternating blue and red), some had spotted tails, and some of the spot-tails had black throats and others did not. We also knew they came from different river systems in South America, since, among others, Ben Rosler (Metropolitan Pet), a knowledgeable local wholesaler, kept track of where they were collected and exported from: Colombia, Venezuela, Peru, Guyana, Brazil, etc.) At the time, ichthyologists (J.P. Gosse, 1974) who had studied the dead, pickled bodies of these '*surinamensis*' earth eaters, concluded that it was one very widely distributed species. A (then) newcomer to South American cichlid ichthyology, Sven Kullander, thought otherwise, and suggested that these were discrete, different species, not just various flavors of *Geophagus surinamensis*, in need of different species names. He thought the colorational and other differences (body shape, scale numbers, etc.) were different enough to justify splitting them as different species.

It was hobbyists who bred these fish that provided the final clue and proof: some of the populational forms were 'immediate' mouthbrooders, which like African Rift Lake cichlids laid their eggs and picked them up in their mouths immediately to incubate them to hatching, while other forms were 'delayed' mouthbrooders, which pasted their eggs down on a rock, guarded them for a few days, then took them in their mouths for final incubation, and some were simply nonmouthbrooding 'substrate brooders' who did the typical cichlid thing and pasted and guarded their eggs!

Clearly, there were more than one species involved! And it was hobbyists who provided the crucial information. How did Kullander learn about this? There was no way of observing these behaviors in the wild, and no ichthyologist sufficiently skilled in getting live fish to breed in the aquarium, leastwise not Dr. Kullander. He didn't breed these himself, rather hobbyists did and wrote about their experiences in hobby magazines that Kullander had the good sense to be reading, and he went 'aha!'. In fact, Kullander and other ichthyologists have increasingly looked to the aquarium hobby community to provide observations of fish behavior they would never see in the wild. Have you heard about mouthbrooding severums? Or contactfeeding pike cichlids? Or Killifish who inject their eggs into cracks in rocks in fast moving streams? Or splashing tetras that jump out of the water to spawn on overhanging plants? Or bubble nest brooding catfish? Or etc., etc., etc. The list goes on and on, and science would be ignorant of all of it if not for tropical fish hobbyists and the articles they have written about observations they have made in their home aquaria! We should give ourselves a huge pat on our collective back!

OK, well maybe your experiences breeding this or that may not prove important or crucial to science (though you never know!), but I am certain someone, somewhere, would love to learn about them even if it is just to repeat them and rack up BAP points. Our hobby is, among other things, about generating and sharing information. I can think of no better chatter vehicle for doing this than a fish club, and no better way for sharing the information within and between fish clubs than through club publications, particularly in this age of the internet and websites, where club journals and your writings are posted on the web for all to access and learn from. So, please, really observe your fish, take good notes and SHARE them with the rest of the tropical fish community by WRITING FOR YOUR CLUB PUBLICATION. Please write!



*This article first appeared in **The Shoreline**, Jersey Shore Aquarium Society, March 2002.
Appeared in the October, 2016 issue of **Modern Aquarium**.*

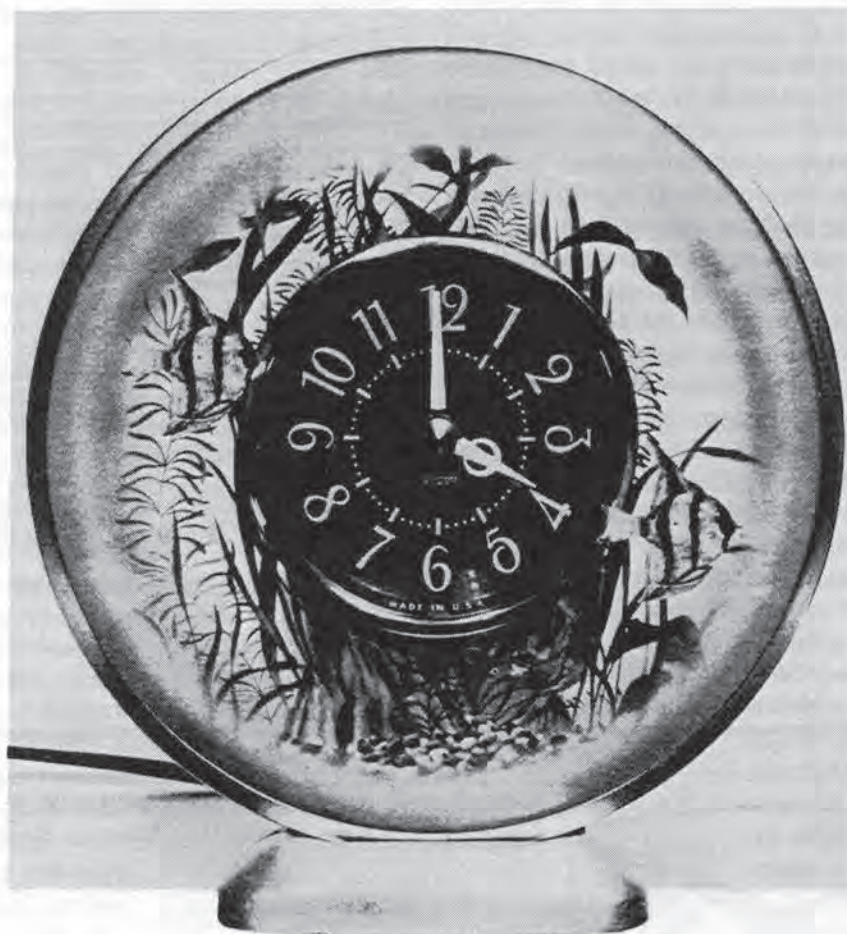


BOWL SHOW RULES

There is a Bowl Show at every GCAS meeting, except our Night at the Auction/ fleamarket meeting and our Holiday Party and Awards Banquet meeting. Bowl shows are open to all members of GCAS. Rules are as follows:

- Only current GCAS members may enter fish in the Bowl Show.
- There is a limit of 2 entries per member per meeting.
- Unlike some other clubs, every month is an “open” Bowl Show at the GCAS (i.e., there is no “theme,” such as that one month cichlids are judged, the next livebearers, the next anabantoids, etc.).
- Any fish that wins any prize (1st, 2nd, or 3rd) may not be entered again in the same meeting year.
- B.Y.O.B. (Bring Your Own Bowl!) Entrants are responsible for providing suitable containers and suitable water for their fish. These containers must be clear on at least three sides.
- Only one fish per container (i.e., no “pairs”).
- No plants, ornaments, or equipment (filters, airstones, etc.) are allowed in the judging tank (an external mirror, or opaque cards between containers is acceptable, as is a cover that does not obstruct side viewing).
- Points are awarded: 5 points for 1st Place, 3 for 2nd Place, and 1 for 3rd Place.
- Ribbons are awarded: blue for 1st Place, red for 2nd Place, and green for 3rd Place.
- The person with the most points at the end of the meeting season receives the Walter Hubel Bowl Show Champion trophy at the Awards Banquet.
- The decision of the judge(s) is final.
- A running UNOFFICIAL total of the points awarded is printed in **Modern Aquarium**. Only the tally of points maintained by the Bowl Show Coordinator is official.
- **In case of ties:**
 - 1st Tiebreaker – most 1st Places
 - 2nd Tiebreaker – most 2nd Places
 - 3rd Tiebreaker – most entries

"UNDERWATER MYSTERY" CLOCK



AMONG THE EDITOR'S most prized Christmas Gifts this season was the original of the above illustration. The "mystery" consists in the constant revolution of the slightly vibrating, apparently unsupported, two Angel Fish. At a dignified pace, characteristic of the species, they make the circuit of the clock face in just a minute.

Behind the lower part of the scene is a small night light that not only enhances the picture, but which makes it easy to read the clock in darkness. The hands themselves are luminous.

The plants and fishes are done in natural, transparent colors, apparently

by hand on a plastic saucer, sunken in the middle, giving a recess for the clock proper, and at the same time adding depth to the scene. Width, 8 inches.

The inside of the front cover (equivalent to the crystal of a watch) is delicately tinted around the edge with what we aquarists know as "algae green". Three smaller stationery fishes in the background are Red Platies, colored to look quite natural.

All our friends have been both charmed and mystified by this Sessions clock. It came from J. E. Caldwell & Company, in Philadelphia.

The Secret of the “Underwater Mystery” Clock

by JOSEPH FERDENZI

Exactly 45 years ago to the month, an interesting one page item appeared in the famous The Aquarium magazine (February 1955). It was entitled “Underwater Mystery Clock,” and featured a black and white photo of a clock (see facing page for the entire piece). As you can see from reading the brief article that accompanies the photo, it was a Christmas gift to the Editor. While he is unnamed on that page, the Editor was none other than America’s foremost hobbyist of the day, the venerable William T. Innes. Innes was a Philadelphian, and the clock came from a store in Philadelphia (no doubt given to Innes in the hope of garnering some publicity).

Innes describes the tropical fish motif on the face of the clock, including the colors, which hobbyists had to envision insofar as the photo was not in color. Innes also attempts to intrigue the reader by alluding to its “mystery”: “the constant revolution of the slightly vibrating, apparently unsupported, two Angel Fish.” Well, through a series of fortuitous events, I can now solve the “mystery” that Innes introduced to aquarists almost half-a-century ago.

These events began around 1994, when Stef Zander (who was the original Art Director of this Modern Aquarium Series III) happened to visit an antique store somewhere on Long Island. There, he came across this clock with an unusual

freshwater aquarium scene. At the time, Stef did not know its history, but he liked how it looked, and purchased it (even though the clock motor no longer functioned). He displayed the clock in his fish room, where I happened to see it one day. I, too, was fascinated by this unusual clock, which

appeared to be of ’50s vintage, but was otherwise unaware of its history. Nevertheless, its existence became firmly imprinted in my mind.

Recently, Stef had to move to a new place. This meant dismantling the fish room. When he told me he was only going to keep a few tanks, and was going to sell everything else (a “garage” sale), I said, “Sell it all, but whatever you do, don’t sell that fish clock.” Stef seemed amused at my recollection of the clock (after all, it had been years since I’d

seen it or spoken about it). But, to my utter surprise and delight, he generously offered to give it to me. I eagerly accepted, knowing that it would be a very nice addition to my collection of aquarium hobby memorabilia.

Now, mind you, the clock didn’t work, but I didn’t care. (As Innes tells it, it also has a night light feature, and this was still working.) Just how many aquarium clocks from the ’50s are you ever going to see? Well, incredibly, in the space of one month after I had acquired the clock, two events of serendipity occurred which shed a great deal of light on the clock.



The “Mystery Clock”

Photo by J. Ferdenzi

This article first appeared in the February, 2000 issue of *Modern Aquarium*

The first event occurred because I began showing the clock to every hobbyist who visited my fish room. Among these was my very good friend and fellow GCAS member, Mark Soberman. Mark shares my passion for antique aquarium books and magazines. Well, as luck would have it, Mark was perusing the February 1955 issue of The Aquarium because it featured a now famous article on breeding the Neon Tetra by our mutual friend and legendary aquarist, Rosario LaCorte. That's when he came across the article on the clock, and told me about it.

The second event occurred because I showed a friend from work the article about the clock. One evening, he happened to be changing channels on TV, when he saw a cable program about antiques. It was featuring clocks — **not** just any clocks, mind you, but Sessions "novelty" clocks (as you can see by the Innes article, this aquarium clock was, indeed, manufactured by Sessions), and one of these aquarium clocks was on TV. The program was brief, but it went on to say that these clocks are apparently very collectible items (for example, another such novelty clock featured a "Davy Crockett" theme), and can be worth anywhere from \$300 (!) to \$700 (!!) in good working order. As my clock indicates, Sessions

was headquartered in Connecticut. I do not know if the company still exists, or if it still makes clocks. There is a Website for clock collectors that might shed more information on these clocks, but we've been unable to find it.

In any event, thanks to my friends, I now know more about this seemingly obscure clock than I had ever hoped. Here was a real piece of aquarium Americana, with a "pedigree" no less.

Perhaps, one day, I'll have the clock repaired. For the time being, it sits as a beautiful ornament in my fish room. As you can see, accompanying this article is a color photo - the first ever to be published of this clock in an aquarium magazine. Unlike Innes' readers of 45 years ago, you don't have to imagine how its colors looked.

The second "first" is that I am about to reveal the secret of the mysterious moving Angel Fish. Yes, they move. Two little bolts hold the two Angel Fish to a clear plastic disk that works like the "second" hand, making a full rotation in 60 seconds. While the use of a clear plastic disk to make objects seemingly move around a clock face may be commonplace today, I don't doubt that, in 1955, it was quite a novelty — deserving to be described as the "underwater mystery" that it was to aquarists of that era.



If you like history, and you like pets, then this is the place for you. Dedicated to the history of aquarium & pet keeping, The Museum of Aquarium & Pet History includes a huge depository of over 3,000 items all focused on the pet industry. From antique fish bowls, aquariums and cages, to foods, medications, books and advertising signs, we've got it all!

To learn more about this amazing collection of historical pet artifacts, please visit our website:

moaph.org

<https://moaph.org/>

The Chocolate Cichlid

(*Hypselecara temporalis*)

by Dan Radebaugh



This article is reprinted from the March, 2010 issue of *Modern Aquarium*.

When it comes to cichlids in the tropical fish hobby, some species seem to have a distinct marketing advantage. Oscars are seemingly born cute, and young ones at a pet shop exude that “take me home and love me” personality they are renowned for. Red devils have the well-deserved name to trade on, as well as an outgoing personality and the orange/gold color. Young severums have a distinctive shape, and look like small versions of what they’ll look like later on. Jaguar cichlids have that rather dangerous, predatory look about them. Unfortunately for inexperienced shoppers, some cichlids don’t look nearly as spectacular or distinctive when young as they will when grown. The chocolate cichlid falls into this category. There is simply not much reason to suspect, when looking at a one or two inch chocolate cichlid, that it will ever look distinctive at all. I believe this is why a lot of people miss out on keeping these great fish. They may just look too generic as youngsters. Of course, that may also save them from the fate of far too many Oscars—an uncomfortable and unhealthy life in a tank far too small, or being dumped in a ditch somewhere

when they outgrow their ten-gallon home, to die later when the weather turns cold. But that’s a subject for another article.

The “Chocolate Cichlid” name is actually shared by two different aquarium fishes, *Hypselecara temporalis*—by far the most widely available—and *Hypselecara coryphaenoides*. Both species also have multiple aliases. *H. temporalis* is referred to as the chocolate cichlid or the emerald cichlid, and boasts a number of taxonomic listings, including *Heros temporalis*, *Cichlasoma temporale*, *Acara crasse*, and others¹, while *H. coryphaenoides*, sometimes also referred to as the Rio Negro chocolate cichlid, sports taxonomic AKA’s such as *Centrarchus niger*, *Chuco axelrodi*, and *Cichlasoma arnoldi*.²

Both species are endemic to the Amazon basin, though generally from somewhat different neighborhoods of that vast area. Both species prefer soft, slightly acidic water, and typically prefer quiet, turbid pools to streams with strong currents. Both are noted for dramatic changes of color depending on their mood, and both have the reputation of being fairly docile for large cichlids. The body shape of the two species is somewhat

dissimilar. The head/face of *H. temporalis* is rather blunt and rounded, whereas photos I have seen of *H. coryphaenoides* show a more sloping profile. I have had no direct experience with *H. coryphaenoides*, so the balance of this article will refer only to *H. temporalis*.

So what about the marketing thing? Being called chocolate can't be all bad, right? Well, perhaps it depends. Chocolate is a familiar name, well-loved by many of us, and so might stimulate some curiosity. On the other hand, it can call to mind a rather uniform, dark brown color. This fish is (usually) not that color. Chocolate lovers aside, I suspect that most people who purchase chocolate cichlids do so either on recommendation from another fishkeeper, or have seen for themselves a spectacular looking adult. I admit that I decided I wanted to keep these fish after coming across a stunning photo on Jeff Rapps' Web site.³ Some months after seeing that picture, a shop in my neighborhood had some young chocolates in stock, and I purchased a small group (three) of them. I put them in a ten-gallon quarantine/grow-out tank along with a similarly sized uaru and a young *Herichthys carpintis*. Even at that small size the *carpintis* was a little too tough a customer for these guys, so he was moved to different quarters. As they grew, all were eventually transferred to larger tanks.



As luck would have it, once the chocolates became sexually mature (around four to five inches) a pair formed. The third fish, a male, became very much the odd man out. This led to some difficulties, as the rejected male then seemingly went into an emotional and physical decline—so much so that he developed a recurring case of HLLE (head and lateral line erosion, also known as hole-in-the-head disease), which only resolved when I removed him from the tank containing the pair. Eventually I found another home for him, and when last I heard, he was doing fine. Meanwhile, the remaining pair



have continued to grow, spawned a few times, and currently reside in a 55-gallon tank along with a young gold severum and a smallish *Hypostomus* sp. pleco, L-077.

Most cichlids are quite expressive of their mood and health by means of their coloration, and *H. temporalis* is one of the more dramatic examples of that trait. While this fish's base color is perhaps best described as an olive (or emerald) green, it is just as likely to show a chocolate-brown coloration, with deep purple or even red highlights. You just never know exactly what they're going to look like. Sometimes they're rather drab, and at other times eye-poppingly colorful.

Temperamentally, though its features may call to mind the face of a retired prizefighter, *H. temporalis* is generally peace-loving, though there can be some disputes over territory. In a community of cichlids, they're fine as long as the company isn't overly assertive. They get along fine with Oscars, severums, uarus, et al, and can manage (but not enjoy) normal cichlid aggression as long as they aren't physically overmatched. In my experience, it's likely to be the female who takes the lead in defense (and indeed in definition) of their territory. Odd in a way, as the males grow significantly larger than the females. Otherwise their appearance is similar.

Chocolates can be rather shy, and some kind of companion fish will help them overcome their caution about being out and about in the aquarium. They aren't especially piscivorous, so your choice of tankmates is fairly broad, though do bear in mind that males grow to a foot or more in length, with a very robust body.

In the wild their diet is manly invertebrates and insects, and they do appreciate the occasional bug. In your aquarium they won't be picky eaters—food sticks and pellets are readily

accepted. These fish have a reputation for liking some veggies in their diet. I've found that they love peas, and will greedily devour algae wafers intended for the pleco, but beyond those two instances vegetables haven't proven to be much of an attraction. Good supplements to their regular diet could be frozen or freeze-dried krill, freeze-dried or live crickets, mealworms, small earthworms (the larger ones seem to worry them), etc.

When spawning they will most often choose a flat rock or other horizontal surface. You'll see a lot of lip-locking and even head-butting (note the shape of their heads in the photos) as they prepare to spawn. There's also a fair amount of head-shaking. I speculate that this could indicate some kind of vocalization, but I haven't invested in hydrophones to confirm that. The eggs hatch in about five days, and the fry spend about that same amount of time in the "wiggler" stage, depending on water temperature (I keep temps in the mid-to-high 70's to low 80's). Remember, they normally reside in slow-moving pools, where water would tend to be rather warmer than if they were in faster moving streams.

Chocolates are not great parents. Once the fry are free-swimming (usually about another five days) they're only casually looked after. At this point it's a good idea to siphon out the fry and place them in another tank. If the spawning happens in a community tank, the parents will likely be absent-minded about defending the fry, and if parents and fry are kept in their own separate spawning tank, the parents may absent-mindedly eat them. The fry can be fed finely crushed flakes, Cyclop-eze, or anything of similar size. They grow fairly quickly, though like many cichlids, in spurts.

Once the spawning is complete and the fry are free-swimming, the pair bond tends to relax quite a bit. The best way to maintain or revive it is to keep them with other fish. If kept by themselves, they seem to become easily annoyed with one another, and may begin hanging out at opposite ends of the tank. One behavioral curiosity I've noticed is that, unlike my other cichlids, which settle down for the night near the bottom, *H. temporalis* seems to prefer sleeping near the surface, at about a thirty degree tail-down attitude.

The chocolate cichlid is a large fish, and a rather messy eater. Not overly active, a pair can do quite nicely in a 55-gallon tank (75 would be better), but you must provide meaningful



filtration. In a 55-gallon tank, if your filter is rated to handle 55 gallons use two of them, and be prepared to do large and frequent water changes. The world won't end if you miss a scheduled water change now and then, but you (and your fish) will notice the difference.

Once chocolates reach adulthood, hiding places seem to hold little attraction, though "landmarks" for territory discrimination are appreciated. Some fishkeepers recommend a planted tank so that they'll feel more secure, and I've found that they won't go out of their way to demolish your plants, but they are large cichlids and they will excavate, so be warned.

If the cichlid of your dreams has to be a certified bad-ass, *H. temporalis* is probably not what you're looking for. On the other hand, if what you want is a big, people-friendly, gorgeously colorful fish to occupy an honored spot in your home, I don't think I could make a better recommendation.



References:

¹<http://www.fishbase.org/summary/SpeciesSummary.php?id=12323>

²<http://www.fishbase.org/summary/SpeciesSummary.php?id=47067>

³<http://www.tangledupincichlids.com/>

Photo at above right by Linda Konst
All other photos by Marsha Radebaugh

GCAS Member Discounts

at Local Fish Shops



10% Discount on everything.



20% Discount on fish. 15% on all else.



10% Discount on everything.



10% Discount on everything.



10% Discount on everything.



10% Discount on fish.



10% Discount on everything.



10% Discount on everything except 'on sale' items.

High Quality Exotic Goldfish
 Show Imports from Thailand & China
 Ranchus, Ryukins, Orandas & Telescopes

Rennie Ramnanan
Hobbyist & Breeder

Call/Text: (917) 445-2010
 Email: renapond@yahoo.com

Professional Shipping to anywhere
 in United States!



10% Discount on everything.

JUNGLE BOB ENTERPRISES, INC.




4130 Sunrise Hwy
 Oakdale, NY 11769
 ph: 631-319-6592
www.JungleBobAquatics.com

Manufacturer of Quality Reptile & Aquarium Supplies

15% Discount on everything in store, or online at:
<http://www.junglebobaquatics.com> Use coupon code gcas15.

AL'S AQUATIC SERVICES INC
ALSAQUATICSERVICES@OUTLOOK.COM

AL TURRISI
 516.633.8806
 CONTRACTOR
 POND DESIGN & INSTALLATION
 SALT & FRESH WATER AQUARIUM SYSTEMS
 REEF TANK SYSTEMS




917-300-2293

124-11 Jamaica Ave
 Richmond Hill, NY 11418

naturesreefandreptile.com

Mon-Sun
 10 am - 8 pm

[natureefandreprs](#)

[nature_reef_reptile](#)

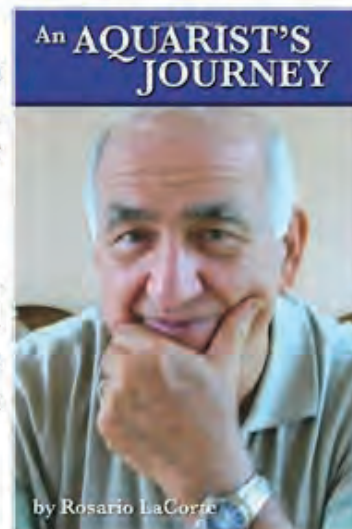
10% Discount on everything.

An Aquarist's Journey

Rosario La Corte is one of the world's leading authorities on breeding fish and he has written numerous articles and books, contributing greatly to our understanding of fish and their habits.

Now, for the first time, here is a compilation of his travels, adventures, successes (and, very occasional failures) all relating to collecting, keeping, and breeding fish, and in his own words (and edited by **Modern Aquarium's** Editor, Dan Radebaugh).

Available in softcover at Amazon.com



Modern Aquarium Covers

2019

modern
AQUARIUM



March 2019
volume XXVI
number 1

modern
AQUARIUM



April 2019
volume XXVI
number 2

modern
AQUARIUM



May 2019
volume XXVI
number 3

modern
AQUARIUM



June 2019
volume XXVI
number 4

modern
AQUARIUM



July 2019
volume XXVI
number 5

modern
AQUARIUM



August 2019
volume XXVI
number 6

modern
AQUARIUM



September 2019
volume XXVI
number 7

modern
AQUARIUM



October 2019
volume XXVI
number 8

modern
AQUARIUM



November 2019
volume XXVI
number 9

modern
AQUARIUM



December 2019
volume XXVI
number 10

March 2019

April 2019

May 2019

June 2019

July 2019

August 2019

September 2019

October 2019

November 2019

December 2019

Diodon hystrix

Heros efasciatus

Pterygoplichthys gibbiceps

Acan, Birdsnest and Montipora corals

Plants - Floating and Otherwise

Hyphessobrycon amandae

Pomacanthus paru

Delancy Street Subway Mural

Juvenile *Thorichthys meeki*

Scorpaena plumieri

by Stephen Sica

by Dan Radebaugh

by Dan Radebaugh

by Joseph F. Gurrado

by Stephen Sica

by Stephen Sica

by Stephen Sica

by Dan Radebaugh

by Lonnie Goldman

by Stephen Sica



Remarkable Longevity of Buffalofish in Arizona

A series by the Undergravel Reporter

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

Back in the 1910s, three species of buffalofish, a fish species with many similarities to carp, were reared in ponds along the Mississippi River in order to establish commercial fisheries throughout the United States. One group of 420 buffalofish of various ages and sizes was sent in 1918 to stock Roosevelt Lake, a newly formed freshwater reservoir in Arizona. A commercial fishery operated there for a period during the 1930s to 1960s.

After the commercial fishery closed in 1970, little attention was paid to the buffalofish. Rod-and-hook anglers have traditionally ignored buffalofish because of (among other hurdles) its tendency to nibble bait for what seems like an eternity without ever setting the hook. In recent years, however, anglers have warmed to the challenge of buffalofishing, and have developed better methods for catching them. What scientists learned from working in conjunction with buffalofish anglers at one lake in Arizona has challenged popular conceptions about longevity in freshwater fish.

In 2018, researchers began to study Apache Lake, a reservoir approximately 60 miles east of Phoenix that formed downstream from Roosevelt Lake between 1924 and 1927. While Roosevelt Lake was extensively fished during the time it was a commercial fishery, Apache Lake was relatively untouched, owing in large part to its tough-to-reach location. The anglers on Apache Lake participated in a catch-photo-release program from July 2018 to July 2023, during which time 222 buffalofish were captured and photographed; among that population 23 were donated to the researchers for further study.

The researchers dissected the otoliths (earstones) of the buffalofish that were donated. In

a manner not too dissimilar to estimating a tree's age based on the rings in its trunk, scientists can estimate the age of a fish based on the layers that form in the otolith. The researchers paired these estimates with a separate analysis based on the size and color of the buffalofish's spots (previous research has found that older buffalofish will have greater orange and black pigmentation).

The researchers were surprised to find that almost all but one of the donated buffalofishes had spawned before 1940, and that most were from the 1920s. Perhaps even more surprising, at least four buffalofishes out of the 23 donated were likely from the initial group of 420 that was used to stock Roosevelt Lake. All three species had at least one centenarian fish (a fish over 100 years old). Given that prior to this study just 35 animal

species worldwide have been documented to have a lifespan of more than 100 years, it was extraordinary to find three separate species of buffalofish with such longevity in one lake.

The buffalofish is remarkable because it is slow-growing, exhibits negligible senescence,

and in some cases improved physiological systems with age. Dr. Alec R. Lackmann, who headed the research, stated that further research into the buffalofish was needed to understand why it has been so resistant to infection and disease throughout its life span, and why it has proven to be so robust into old age. "The genus *Ichtiobus* has potential to prove of high value to the field of gerontology, and Apache Lake could become an epicenter for a variety of scientific research in the future," according to Dr. Lackmann. "The research begs the question: what is the buffalofishes' fountain of youth?" he added.

Time will tell if future researchers can answer that question.



Sources:

University of Minnesota. "Study uncovers hundred-year lifespans for three freshwater fish species in the Arizona desert." **ScienceDaily**. **ScienceDaily**, 30 October 2023. <www.sciencedaily.com/releases/2023/10/231030194417.htm>.

Photo from Wikipedia





Fun Fish

by BERNARD HARRIGAN

When I think of fun fish, the first one to come to mind is the Weather Loach, *Misgurnus fossilis*. Eel-like in appearance, the front part of the body is cylindrical, while the back end is strongly compressed to the tail. This fish has small fins and mouth, with two long pairs of barbels in the upper jaw and one short pair in the lower jaw. Its body is yellowish-brown, with some pretty brown horizontal bands. It has an odd beauty all its own.

To the hobbyist it is an absolutely undemanding, peaceful fish—comical at times, with its eel-like movements. As it pushes its barbels around searching for food below the gravel, through java moss and plants, and sometimes down an undergravel filter tube, it seems almost dog-like in its search for food. This is no automatic fish that just swims in circles. It checks everything in the tank out.

The Weather Loach is native to Central and Eastern Europe, coming from slow-moving to stagnant shallow waters. At dry times in nature, it digs itself into the mud and may remain there for long periods. When the rains come, the Weather Loach is reactivated, springing to life and ready for a fresh start. It is very hardy, and it can get oxygen right from the air through its intestines. At times

you can hear a smacking noise as it surfaces to take in air.

Feeding this fish is a breeze—flakes, freeze dried, pellets, as well as live food are readily taken. While mostly a bottom feeder, it's been known to feed from the middle, and

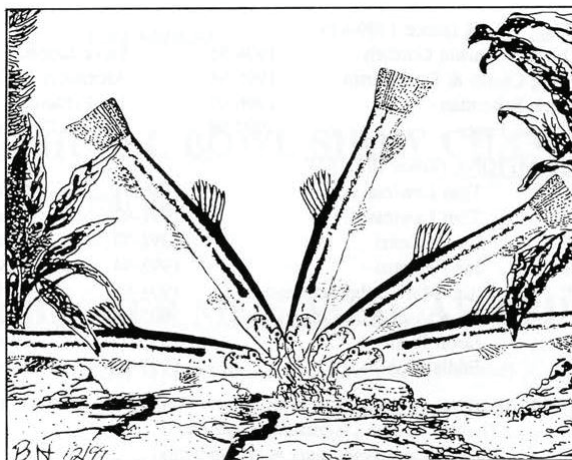
it will sometimes even feed right from the surface. If you have a spot in your tank where detritus accumulates, the Weather Loach will move that out for you in his relentless pursuit of food. Food does not hide from this guy.

This fish got the name "Weather Loach" because it's sensitive

to the electricity in the air or to changes in atmospheric pressure, which cause it to become restless to an almost nervous state. At times like that, if the fish have been properly conditioned, you'll be treated to an interesting mating game. The fish will flit around the tank side by side, or chasing each other, they will lay eggs singly or in small clumps, on plants or near the bottom.

The Weather Loach is truly a treasure to be kept in almost any tanks. It is as much fun to watch as it is to keep. I wouldn't hesitate to recommend it to beginner and advanced hobbyists alike.

Until next time, remember to have fun fishkeeping!



Weather Loach (*Misgurnus fossilis*) drawing by B. Harrigan





Koi Organisation International

Can You Be a Better Koi Keeper, and Do It At Your Leisure?

Q: What if there was a source right in your home, available 24/7/365, that could provide the information you want and need about Koi keeping? Wouldn't that be nice, not to mention convenient?

A: Good News! There is just such a source and it's only a click away on your own computer. Water Quality course suitable for ALL fish keepers! Learn something new today!

Current. Accurate. Useful.

www.KoiOrganisationInternational.org



