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August 2020
volume XXVII
number 6

Greater City Aquarium Society - New York

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Series III Vol. XXVII, No. 6 August, 2020

ON THE COVER

Our cover photo this month features a striking Toadstool Mushroom Leather Coral, *Sarcophyton* sp. This photo was submitted to our Facebook Fishy Friends' page.

Photo by Joseph F. Gurrado

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From the Editor

by Dan Radebaugh

Well, here we still are, being plagued by COVID19. It's just as well that I'm getting older, and am just as happy to spend my days taking naps. TV just isn't cutting it. Even reruns of *good* shows are starting to cross my eyes, and how many of those are there? Now the threat seems to be that our area could be re-infected by visitors from states whose leaders were too dumb and/or irresponsible to take the necessary and recommended precautions. In any event, none of us is truly safe until an effective vaccine is available, though I'm still hopeful that we may be able to resume *some* kind of real activity in the foreseeable future. It's been great that we've at least been able to have some "guest speakers" online, but it really isn't the same as being able to actually meet and speak with one another in an unscripted way, trade fish and plants, and so on. Maybe the gods will smile and we can resume somewhat normal activity soon, but don't count on it. Best case for a vaccine looks like around January.

In this issue, our MA CLASSICS choice is from a previous series of **Modern Aquarium**, the April, 1969 issue. The title is "Using Rocks Effectively," by Dan and Mary Carson. There is a notation on the opening page that this article was excerpted from a forthcoming book by the two, but in my searches I have not been able to find mention of the book. I attempted to contact Mary, but got a bounce-back from her email account. I was able to learn that she had been moved into a rehab facility, but I have not been able to learn when, where, why, or what her current status is. We certainly wish her well!

We have two exchange articles this month: "Breeding the *Candidia* Goby," by Larry Felz, won 2nd Place in the Breeder Class of the 2016 NEC Articles Competition, and "Fish Happen," by Brian Candib, won third place in that same competition and class. Congratulations to both authors!

On the home-grown side, Stephen Sica contributes one of his marvelous photo essays, this



one entitled, "A Nurse In Time." I'll leave it to you to discover who this nurse is, and what he or she was in time for. For GCAS members who are also movie buffs, Joe Ferdenzi contributes a delightful article about "Aquariums In The Movies." Check out how many of these you've seen. It's fun!

Joe Graffagnino tells us about an African cichlid from Cameroon, *Coptodon kottae*, a new one to me. Golden colored, this one looks like it might be a nice addition for those of you on the African side of the hobby, or an interesting foray for those thinking of diversifying a bit from the American side.

Yours Truly gets in on the action with an article called "The Natural Aquarium—Does it Exist?" I'm not at all sure that I answer that question, but I talk a bit about why I have some trouble with the term.

The Undergravel Reporter provides us with some intriguing information about the relationship between genes and fighting among *Betta splendens*, the Siamese fighting fish. Speaking of fighting, how are *you* getting along with your significant other (and others) during this recent period of rampant togetherness that we've been going through? Perhaps there are studies we could volunteer for to be tested for our own genetic responses—hopefully without the mandatory "sacrifice" that was the reward for these fish.

The issue closes with a Fin Fun question: "Who is That Masked Fish?"





GCAS Programs

2020

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

March 4	Joseph Ferdenzi <i>Aquascaping</i>
April 1	Meeting Cancelled <i>Covid-19</i>
May 6	Lawrence Kent <i>Holy Grail Cichlids, Friends, and Other Fish: Two West African Stories</i>
June 3	Pam Chin <i>Swimming With Cichlids - Zambia</i>
July 2	Lawrence Flint <i>Reef Aquarium Systems in Schools</i>
August 6	Stephen Chester <i>The Aquarium Hobby in the UK</i>
September 2	Peter Izzo <i>Getting to Know the Genus <i>Gymnogeophagus</i></i>
October 7	Larry Johnson <i>TBA</i>
November 4	<i>TBA</i>
December 2	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 2020 by the Greater City Aquarium Society Inc., a not-for-profit New York State corporation. All rights reserved. Not-for-profit aquarium societies are hereby granted permission to reproduce articles and illustrations from this publication, **unless the article indicates that the copyrights have been retained by the author**, and provided reprints indicate source, and that two copies of the publication are sent to the Exchange Editor of this magazine. For online-only publications, copies may be sent via email to 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 in the mail or by email. For more information, contact: Dan Radebaugh at (718) 458-8437, email 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

In the beginning there were a few people with flu-like symptoms. Look what it turned into. Now people are sick and tired of masks, to say nothing of being in lockdown, cooped up at home and going stir-crazy. Does right now represent the new normal? Or will we soon be going around in bubble-helmets, breathing purified air from tanks we carry on our backs? Sort of like one of Steve Sica's diving stories, only without being underwater. Is the planet not ours any more, and/or are we heading for a Sixth Extinction, starring ourselves? And if we're gone, who's going to write the history? A few desperate souls who take refuge underground? Who should we call—Ghostbusters? Trump had predicted that the outbreak would be over by Easter. Biden updated that and predicted (promised?) that it would be over by the Holidays (which ones?). Of course neither specified what year.



Image from NYTimes.com

We are all of course impatient to resume our normal meeting schedule, and looking forward to a great Welcome Back meeting, where we can have fun exchanging our experiences during the COVID crisis, and of course bragging about how clean our tanks are and how many fish we have bred, what with all the time we've had on our hands.

What should we do with all that extra time? Here is one suggestion. There is nothing quite like taking a swing at a piñata. What better way to get some stress relief and a few laughs? So start building your own piñata—a green orb with red pom-poms sticking out—and beat it till it falls apart! Don't you feel better just thinking about it? Apparently there are people all around the country building papier-mâché viruses and smashing them! We will get even!

See you soon!?

Horst



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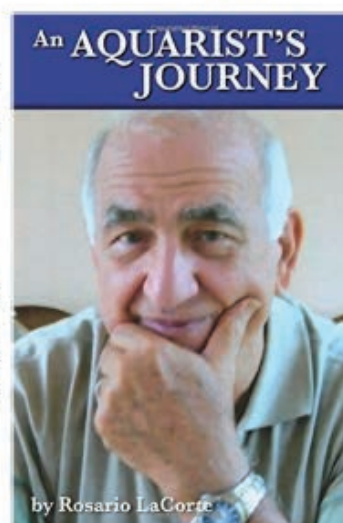
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An Aquarist's Journey

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).

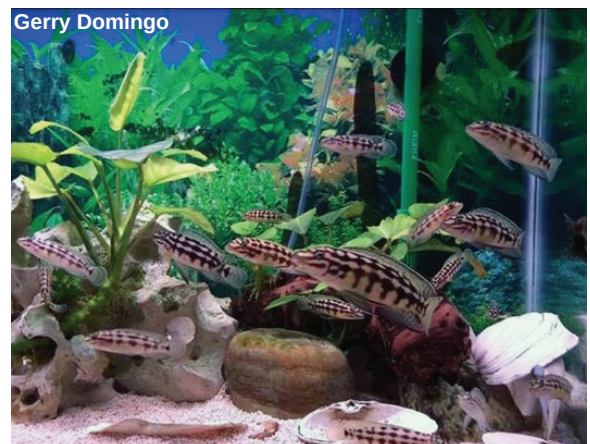
Available in softcover at [Amazon.com](https://www.amazon.com)



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!



Aquariums In The Movies

by Joseph Ferdenzi

As a veteran aquarium nut, it is often the case that I take note of aquariums featured in movies. In this article, I will highlight some of the movies I'm familiar with, but I have no doubt that this compendium is far from exhaustive.

At the top of my list of movie aquariums is **The Dragon Murder Case** from 1934. I have written extensively about this movie before, in the February 1998 and May 1999 issues of **Modern Aquarium**. Therefore I won't go far beyond saying that aquariums are very prominently featured—indeed that whole murder mystery revolves around the tropical fish hobby.

Another film from 1934, **Imitation of Life**, also prominently features aquariums. This is largely due to the fact that the male lead in the film is an ichthyologist. The tank in his laboratory is recognizable as a 40 gallon brass aquarium similar to the kind marketed by the famous Grassyfork Fisheries of Indiana.



Imitation of Life -- 1934

From 1940 we have **The Lone Wolf Strikes**. The title character is a private detective with a shady background. The film opens with a scene in which he is feeding his aquarium fishes and waxing poetic to his butler about the joys of tropical fish. His apartment features an eight foot high wall that holds some twenty aquariums! The actor playing the Lone Wolf is Warren William, a noted actor of his day, who also starred in the previously mentioned two movies from 1934. What a coincidence!

Another significant film is 1932's **The Penguin Pool Murder**. This film, as far as I know, is the only movie ever shot on location at the original New York Aquarium in Battery Park. You can see many of the aquariums and how they were laid out. Indeed, most of the story takes place inside the Aquarium, and so makes this film of historical interest on that basis as well.

In the 1936 film **Born To Dance**, a major Hollywood production starring Eleanor Powell and Jimmy Stewart, there is an interesting scene in which Powell and a friend meet at a restaurant. What is

interesting to me is that the walls of the restaurant contain huge aquariums. Indeed, Powell and her friend sit at a booth behind which is a huge aquarium containing goldfish and angelfish, among others. There are also plants, but I can't tell if they are real. The idea of a restaurant decorated with aquariums is not just some Hollywood make-believe. My research has shown that there were many such restaurants back in the day, many billed as The Aquarium Restaurant, in New York, Boston, and Honolulu.



Born To Dance -- 1936

An aquarium is less prominently displayed in the 1942 film **The Major and the Minor**, starring Ginger Rogers, but it has a feature that caught my eye, and is exceedingly rare. In most films all you ever see is the aquarium, but practically no real equipment. In this film you can see that the tank is powered by a Marco air pump, made by the Maris Brothers of New Jersey. Marco pumps were very unique, because although they had a piston, it used no belts. Instead, the pump had a large metal disc that rotated between electro-magnets—very quiet and very expensive! In the scene where Rogers is looking over the tank you can clearly see one in the lower left corner of the shot.



The Major and the Minor -- 1942

A few years later (1944) Hollywood made **Experiment Perilous**, a vehicle for big-time star Hedy Lamarr. One scene takes place in an opulent mansion which has a hallway lined with large aquariums set into the walls. The story takes place in 1903 New York City, so it is very interesting to see these aquariums being depicted at a time when the aquarium hobby was still in its infancy.



Experiment Perilous -- 1944

Jumping forward two decades to 1964, we have **The Incredible Mr. Limpet**, starring Don Knotts (who had gained fame playing the comedic Deputy Sheriff Barney Fife on TV's **The Andy Griffith Show**). The sad-sack Mr. Limpet loves fish, and has a large aquarium right in the middle of his living room—much to the consternation of his wife (sound familiar?). He is seen doing a water change with a contraption that I have never seen used for any home aquarium. But, hey, this is Hollywood!



The Incredible Mr. Limpet -- 1964

A year earlier, the blockbuster James Bond film, **From Russia With Love** had been released. This movie has a sinister scene in which “the bad guys” are meeting and watching some *Bettas* fight to the

death. (By the way, the same kind of scene appeared in **The Dragon Murder Case**.) As much as that is a deplorable use of fish, what is eye-catching is the beautiful aquarium in which the *Bettas* contest. It is much like the traditional *Betta* tanks of the 1960s—long but narrow, with multiple compartments separated by panes of glass—but this one is extremely ornate and carries the symbol of the evil organization known as SPECTRE (I wonder whatever happened to that prop?). Of course this is not the only Bond film to feature an aquarium. Twenty years later (1983), another aquarium—this time a saltwater one—is prominently featured in **Octopussy**, this one starring Roger Moore rather than Sean Connery. This aquarium houses, among other creatures, a deadly blue-ringed octopus.

My tour of the movies ends with 1988's **A Fish Called Wanda**. This dark comedy has an aquarium as the central plot prop and a character (played by British comic Michael Palin) who, like 1964's Mr. Limpet, deeply cares for his fish. Not to give away any parts of the plot, but I feel compelled to tell you (in case you watch the movie) that no real tropical fish are eaten. They are fake fish made of Jello!



From Russia With Love -- 1963

I have seen at least once all of the movies I have described. I enjoyed each of them, and the genres run the gamut: murder mysteries, musicals, comedies, melodramas, and action thrillers. Yet the movie makers all thought aquariums had a role to play. I'm glad they did.



Fish Happen!

Story and photos by Brian Candib

I should not be considered any kind of purposeful fish breeder. I believe that in many of my tanks a certain amount of propagation may be happening, but what happens to many of those offspring is something I never really like to think about. Oh sure, there is the obvious surprise when I find a baby molly or platy swimming around in a community tank. Of no surprise are the neverending baby guppies that just appear on a weekly basis.

At one time I made a deliberate attempt to breed my albino cory catfish (I had three at the time), but I managed to frighten the parents when separating the fry, which instantly turned the task into a race to remove the parents before they could eat all of the little buggers (they are extremely fast). So while breeding fish may come easily to others, to me it is like trying to navigate the rapids of the White River on an inner tube and hoping I do not get hung up on the rocks in the process.

That said, in two specific cases I have found a certain amount of satisfaction in just letting the fish be fish. The first of these is a tank specifically for my *Ancistrus*. This is a 10 gallon tank, and they are the only inhabitants. I provide enough caves, broken pots and plants, as well as a chunk of driftwood for them to thrive in. They do their thing, and my only thing is to remove young ones from time to time and spread



Ameca splendens, a CARES-listed species, reproduces in Brian's planted bowfront aquarium.

them around to my other tanks or give them to others as needed. I also took a couple of them to work to clean up my dirty looking fishbowl, which has done wonders and gotten me a lot of compliments from coworkers.

The second case is my 30 gallon bowfront tank in which I have many butterfly splitfin (*Ameca splendens*). The nice, or should I say, easy thing about them is that they are livebearers. Having baby fish come out at a fairly good size kind of takes the pressure off. I just let them thrive among the loads of plants (Java fern, Java moss and *Anubias*), and nature does the rest. I am proud of doing what I can to help the species, as they are critically endangered. I strongly feel that we should all have at least one tank devoted to propagating a CARES-listed fish, and promote the idea to as many of our fellow hobbyists as we can.

I wish I could say that I am instrumental in the propagation and distribution of rare fishes, but alas, in my fishroom the motto is "Fish Happen!"



Before and after. A water change and a couple of small bushyoose plecos turned Brian's desktop bowl around and earned him some compliments from coworkers.





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Coptodon kottae

Story and Photos by Joseph Graffagnino



This beautiful gold African cichlid with a black throat hails from the southwest part of Cameroon, specifically from two lakes: Lake Barombi-ba-Kotto and the smaller Lake Mboandong. Originally known as *Tilapia kottae*, this beautiful fish is threatened with extinction because of an influx of humans seeking to settle in the general area, pollution, and the increasing number of local palm oil plantations encroaching on its habitat.

While at a North Jersey Aquarium Society event I came across a bag of a half dozen of them. I strongly suspect that they were donated by Dr. Paul Loiselle. I was fortunate enough to obtain this bag from the auction, and brought them home, housing them in a 15-gallon aquarium with several caves, and a few long tube type clay caves. The water was 81 degrees Fahrenheit and the pH was 6.5. *Coptodon kottae* can reach 6 inches in length, and enjoys a water temperature range of between 75 and 83 degrees Fahrenheit.

After a few months, a pair bonded and took over the area around the long tube type cave. I moved the remaining four to a 10-gallon tank. Within a week the four became two, and the remaining two took over a flower pot. In the 15-gallon tank, the female (the way I could sex them was that the female was

slightly smaller) never left the cave, and she never stopped fanning inside the cave. I took a peek using a flashlight, and found green eggs on the floor of the cave. *Many* eggs!

Three days later they hatched, and the fry were very tiny. Two days after they hatched they were free-swimming. I have never before experienced African cichlid fry going from egg to free-swimming in five days! I keep species tanks, so there were no other fish to bother this new family of *Coptodons*. The babies were a pale beige color, and didn't start to get their gold color with black throat until they were 2 ½ months old.

A week later the *Coptodon* pair in the 10-gallon tank appeared with their babies, (again, a *lot* of babies). The parents are very protective. They attacked my hand every time I went to clean the tank or feed them; going so far as to leap out of the tank to bite me! Interesting to note is that the parents did not fight, and the fry remained near the parents. Also, I found it surprising that the parents' gold coloration changed to black when they were guarding their fry.

Just like the parents, the fry would eat anything offered to them and always look for more—they are always hungry! I fed them crushed flakes, tiny pellet food, frozen rotifers, microworms, and a couple of



weeks later I gave them larger foods like live or frozen brine shrimp, larger pellets, mixed flakes, frozen daphnia, cut up frozen and live worms and vegetable pellets. The fry grew quickly! I had so many that I moved them to a 50-gallon breeder grow-out tank and several 10-gallon bare-bottom aquariums.

Naturally, problems will arise with that many fish. During the winter a heater in a 10-gallon malfunctioned, and I lost an entire tank of baby fish, probably 75-100 fry. In the 50-gallon tank I added a spider wood decorative piece. The spider wood started to fungus, so I removed it and asked the store I got it from if this was normal. I was assured that it was, and that I should just rub it off and rinse it, and it would be fine. It fungused again within a week or two, and I noticed the babies were picking at the fungused wood. I assumed it was safe, but in less than a week the entire tank was wiped clean of fry. I counted 330 dead fry! On the plus side, I had spread the fry over six tanks, so I still had 300-400 babies swimming. As I said, there were a lot of babies!

If you want a beautiful, yet odd African cichlid that can take a varied pH range and normal

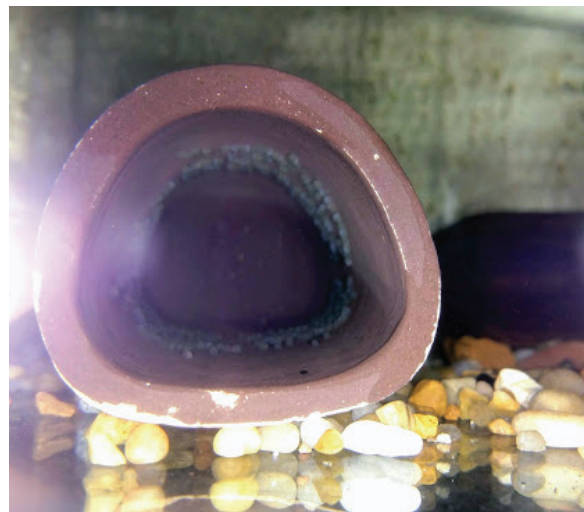
temperatures, then I suggest getting several of these colorful cichlids. Enjoy!

References:

My notes

Wikipedia

www.Fishbase.sinica.edu.tw



A Nurse In Time

Story and Photos by Stephen Sica



The afternoon that we arrived in Key Largo we took Cordelia for a walk along the boat canal walkway and docks. Cordelia stopped to watch a fisherman cleaning his morning catch.

The current pandemic often prompts me to think about “the good old days.” In the past when friends or acquaintances would mention the good old days, I would inform them, without hesitation, that *these* days (the present) are the good old days. But now I wonder. I guess it doesn’t pay to think too much—something I admit I am often guilty of during my ramblings, although I’m pretty sure that Donna would regard said ramblings as just vacuous. Always in search of a good story, or at least an average one, I often get carried away. So now I feel that it is time to write something positive about nurses.

My experience with nurses is very limited. In early 2014 I had the misfortune to stay six nights in two Nassau County hospitals. I was a little lucky, because after my second stay a pending snowstorm motivated the hospital to release me a day early. Saved by snow! I don’t even like the stuff! Allies turn up in ironic ways. I should consider this during the next blizzard. I was quite pleased with the outcome of my surgeries, but what impressed me the most was the care provided by every nurse who took care of me. I told Donna how good those nurses were, including the one male nurse, so she prompted me to write a thank-you note. I also made a small monetary contribution to honor those wonderful nurses.

And what better way is there to honor a nurse than to write about her (or him)? Of course this being a magazine about all things fish (though the editor allows me to digress a bit now and then), I decided to write about the nurse shark. I was prompted by my recollections while writing last month’s Key Largo story and the events that followed while we were there.

On the Wednesday afternoon that we arrived in Key Largo, we took Cordelia along the walkway that borders the boat canal that leads to the ocean. This is the route used by pleasure craft and dive boats. The three of us usually take this walk twice daily, for exercise and to survey the variety of docked boats. When we came to the first turn along the channel, Donna spotted a man cleaning fish. We decided to watch as he tossed entrails over his cleaning table. Suddenly Cordelia spotted a commotion in the water. We looked and saw several small nurse sharks and a few larger ones in a mini feeding frenzy! Luckily I had my camera, so I snapped a few photos as well as I could with the bright sun reflecting off the water’s surface.

When we are diving it is exciting to see sharks, even relatively harmless ones, such as the nurse. Here we are, totally dry, looking down by our feet at a dozen sharks. I must admit that I was impressed. After a



This is the sight that Cordelia, Donna and I beheld when we looked down into the water where the fisherman discarded the fish entrails.



I noticed that one or two of the sharks had fin tags.



The "feeding frenzy" continued. These sharks appear brownish in color, rather than gray.

few minutes we continued our walk. Upon our return both the fish cleaner and the sharks were gone, but I continually searched the water right next to the dock as we walked back to our hotel. I saw two solitary sharks swimming along the dock—something that I had never seen before. Food plus repetition equaled trained nurse sharks. I was impressed.

Due to a strong wind we did not go diving until Saturday morning. When we finally stepped from the back of the dive boat we were greeted by decent underwater visibility. Sometimes the captain searches for areas where the surface wind does not affect the underwater visibility too strongly. At other times you cannot see more than a foot or two, which ruins the dive. There are some boat captains who will take you out in adverse conditions. Others give divers the option,



These sharks were literally at our feet! It was a sight that we had never seen before on a walk we had taken dozens of times over the years.



Nurse shark encounters usually find a fish either resting or sleeping on the bottom in a protected reef. I've found many difficult to photograph sharks well-hidden in reefs. The sharks today were openly swimming along the reef.

while some would stay at the dock. Many years ago we were diving in Marathon in the Florida Keys. After our first dive we saw a thunderstorm on the horizon heading our way. The boat captain shrugged it off, and we began our second dive. We were called back to the boat five minutes later by a clanging on the ladder. Sound travels quite easily underwater. We surfaced into a fierce thunderstorm. Later I complained, to no avail, since we allegedly made two "official" dives. We never used that vendor again.

Once underwater with my camera in hand, I was on the lookout for extraordinary sea life. I was with three other divers— Donna, our nephew Christopher,



I was searching for photo opportunities when I almost jumped out of my wetsuit! This nurse shark, *Ginglymostoma cirratum*, swam right under and past me with speed. If I had known it was coming, I could have literally wrapped my legs around it!



Here's another photo of the Nurse shark *Ginglymostoma cirratum*, as it swam away from our close encounter. I wonder if this fish visits the walkway and dock for lunch.



Oblivious to divers Donna and Chris in the background, this nurse shark swam in circles around the reef for several minutes. I must have been in its chosen path, because it kept swimming past me, which initially made me a bit concerned.



Two pelicans are intent on stealing a fish from a bird that may be a white heron. The heron won this encounter.

and our dive buddy, Melinda from the Florida panhandle. She was lagging behind and poking her head and flashlight into crevices and under ledges. These ledges, just above the sandy bottom, are often resting places for large fish. If you are with a group and a diver spots something, everyone hurries over to look. If I am near the end of the line, all the kicked up sand is like a snow storm. It will take several minutes to settle before you can see anything. By then, everyone else has swum away. In Florida, where the visibility is never pristine, you can easily find yourself lost!



When you awaken from a poolside nap in the Keys, you never know who will become your pool mate.

We swam around for a while, when a large fish swam past me, literally between my legs! I almost jumped out of my wetsuit, but managed to press the shutter since I was holding my camera in front of my chest. It was a nurse shark, swimming in a large arc around this section of the reef. It would disappear into the murk and then reappear. I could not track it in the poor visibility, so whenever it swam by me I attempted to photograph it. I felt like "tail end Charlie" photographing the shark's backside.

The nurse shark, *Ginglymodtoma cirratum*, can grow to fourteen feet. It is the only shark found in the Atlantic Ocean and related seas that has barbels. This shark's average size is five to nine feet, but it occasionally grows to the astounding length of fourteen feet. The largest one that I have seen was about eight feet. This fish inhabits depths from only ten to 100 feet. A distinctive feature is its two dorsal fins. It has a small mouth with grinding teeth, and its coloring ranges from gray to yellowish brown. It usually ignores divers, but may bite if provoked. It is not a common fish, but it can be found throughout the Caribbean, Gulf of Mexico and Atlantic from Rhode Island to Bermuda, and even Brazil.

Like its more menacing relatives, the nurse shark can provide both entertainment and excitement—especially when you don't see it coming!



Donna and Cordelia pose near the bow of our dive boat, Sea Dwellers III.



A large graphic for NorthFin fish food. The background is a deep blue with a wavy, water-like texture. At the top, a stylized wave in red, white, and blue arches over the brand name "NorthFin", where "North" is in blue and "Fin" is in red. Below the brand name, the text "100% Premium Ingredients In Every Pellet" is written in a bold, yellow, sans-serif font. Underneath this, three bullet points in the same yellow font list the product's features: "➤ Filler Free", "➤ By-Product Free", and "➤ Artificial Pigment Free". At the bottom left, there is a small Canadian flag, and to its right, the words "MADE IN CANADA" are written in a bold, yellow, sans-serif font.

Breeding the *Candidia* Goby

by Larry Feltz



Photo from AquaticArts.com

I learned about keeping tropical fish from others—mostly fish hobbyists. My learning curve took off when I joined the New Hampshire Aquarium Society (NHAS). I was hooked by the tales of other fishkeepers. I would listen to what members who sold fish they had bred at club auctions had to say, and I would try to do what they said they did. That is, I tried to duplicate their successes. Over the years the club has provided me with many mentors.

Even while trying to follow other club breeders, I made many mistakes (had opportunities to grow) along the way. I became aware of the Breeder Award Program (BAP). Being frugal, I tried to get the best fish stock available for the lowest price. In this way the New Hampshire Aquarium Society's club auction proved to be a wonderful source for inexpensive fish, food, equipment, and supplies. I bred fishes from Class A through C (Easy to Difficult) with varying degrees of success, but never the elusive Class D (read Very Difficult) fish.

I did venture into the "D" fishes early in the process. Inspired by NHAS member Don Van Pelt, I have maintained a tank of *Synodontis petrocola* for 15 years, but they never bred successfully for me. Later on, fellow club member Norman Brandt successfully bred "Bumblebee Gobies." I tried to follow him there; again with no real success. I finally had success with the "Peacock Gudgeon," a Class D fish. Norman Brandt took me (and others) by the hand and taught me how to work with them. Norm would later share with me the "secrets" of the *Candidia* Goby (*Rhinogobius candidianus*), my second Class D fish, and the subject of this article. As I came to understand it, everything Norman told me seemed to be contrary to what other published sources seemed to suggest. But I tried to do

what he said he did, the way he said to do it. Neither he nor I would tell you this is THE CORRECT WAY. But this the way I did it—following my interpretation of how he told me he became successful. It worked for me.

When I first saw Norman's gobies, he had a breeding pair of adults in an obviously well used, otherwise nondescript 10 gallon tank half-filled with water. I also saw his tank of young fry and his grow-out tank. He told me they were cave-spawners. Like the gudgeons he had helped me with before, he said these fish also were cave-spawners. Where we had used short, 2-3 inch long, half-inch diameter sections of CVC pipe with an end-cap for the smaller gudgeon, he used a 4-5 inch long, 1 inch diameter PVC pipe with an end-cap to simulate a cave for the larger rhino goby. He recommended one "cave" for each male, plus an extra—to keep the territorial males from fighting over the caves. Otherwise the tank was pretty much bare (though it seemed "alive" with microorganisms from the organic matter it contained (sometimes referred to as "detritus," "mulm," or "dirt").

He said the water was pretty much neutral. There were no powerheads, no fancy external pumps, no exotic filters. As mentioned above, the tank was not scrupulously clean. As a matter of fact I commented to him about that. He indicated that that was not really necessary to be successful. When asked what he was feeding them, he said "flake food." Now this sounds like my kind of fish!

I tried to duplicate that setup. I used one of my home-made box filters (cut off Gatorade bottle bottom for the outside; cut off top of a water bottle for the inside; a simple air-lift tube with aquarium gravel for filter media. I tossed in some Java moss

Reprinted from the NEC Newsletter of May, 2020, This article, originally published in June 2015 edition(vol 25, number 6, page 5) of Granite Fisher by the New Hampshire Aquarium Society, was the 2nd Place Breeder Class winner in the 2016 NEC Articles Competition.

for good measure. And yes, a pair of young adult *Rhinogobius candidianus*. When I queried “how soon will I get eggs?” the reply was 14 days. WRONG! It took almost 28 days. Can you believe that? What a wonderful development – almost instant eggs—and I had never seen a synodontis egg in fifteen years!

In the beginning I was very watchful. This could be it; I could finally get a second Class D fish! But the fish were somewhat uninspiring. They differed in appearance from any other fish I had worked with before. I even thought them to be quite UGLY in the beginning. They were certainly not to be confused with the beautiful delta-tale guppy; they were not gorgeous like the *Julidichromis*. They seemed relatively inactive, swam funny, and had ridiculous clown-like fins near the gills. The male and female pretty much ignored one another. Most of their interaction seemed to be aggression; he driving her away at feeding time. But I was hopeful.

As time passed the male moved into a cave and sort of set up housekeeping. She seemed to ignore him and he her. But as time passed he did seem to ‘pursue’ her, trying to get her attention. I was full of anticipation. Eventually she began to appear less disinterested. She was filling up with eggs. Her belly began to look blue through her almost transparent skin as the eggs matured). He became more interested in her, and she seemed a bit more receptive to his advances. And then, WOW! There was the ‘pre-nuptial dance’ that I had read about online! He tried to coax her into the cave, but she would not submit to that old line about “come in and I’ll show you my etchings.” Then suddenly, into the tent she went. WOW again! I caught some of that on video. I found myself watching them frequently and for long periods of time, I only saw one spawning event. Online literature says they will spawn repeatedly over several days.

Eventually, as I had read and been told, he drove her away, and began to tend the eggs without any help from her. He positioned himself head-pointed-out at the mouth of cave. With his body inside the cave he used his previously-described (clown-like) anterior fins (that now appeared perfectly adapted to this task) to move water into and out of the cave, that is, ‘fanning’—to oxygenate the eggs and prevent the growth of fungus. He appeared to do this almost constantly. He seldom paused. He would venture out to take food, but always quickly returned to his work.

He was a great parent, tending the eggs faithfully until they were ready to hatch. The time required seems to vary, with temperature seemingly a big determinant. My experience was that it took twenty-eight days from spawning to hatching.

The male urge to provide parental care does sometimes seem to wane or disappear entirely. When the urge to care ends dad abandons his offspring. Whether he begins to see them as food is subject to debate. This reportedly occurs:

1. when the eggs begin to hatch
2. shortly after hatching
3. soon after hatching
4. when the fry become free-swimming
5. a day or two after the fry swim

Whenever it occurs, it is this problem that prompts the would-be breeder to remove the eggs and attempt to hatch them artificially (away from the parent).

This is how I successfully got the *Rhinogobius candidianus* to breed. In a later article I hope to try to tell you how I hatched *candidianus* fry away from their parents and got them to the viable fry stage. Therein will lie another “secret” or two.



The Natural Aquarium

Does it Exist?

By Dan Radebaugh

Over the years here at Greater City we've been treated to many guest speaker presentations, articles, photo essays, and all manner of other discussions on the subject of aquascaping, as well as on the somewhat related topics of "natural" or "natural-looking" aquariums. The "balanced" aquarium also seems to be a subject that never completely goes away, but what exactly does "balanced" mean? To me the concept seems to imply a closed system, and smacks a bit of the quest for perpetual motion. I can't think of an example in nature. Joe Ferdenzi has mentioned that he intends to experiment with the concept; I applaud this and look forward to seeing his results.

So how about the so-called "natural" aquarium? What does that mean? Natural in what way? It looks the way we imagine a beautiful underwater habitat should look? On what are we basing our expectation? When I was a teenager my family took many trips to "natural" places—for instance the Great Smoky Mountains National Park. Beautiful and natural, right? Well, sort of. Forty years or so before our visit to that area a fungus from Asia had killed thirty or forty million Chestnut trees in North America, and by the time of our visit(s), the habitat was quite different, and included the corpses of all those huge trees. So was what we were looking at really "natural?" Clearly the dense newer growth we were seeing was "natural," but in a very short time the appearance and ecology of the old-growth Chestnut forest that had existed not so many years previously had been drastically changed, pretty much by humans inadvertently spreading the killer fungus. So which version was "natural?" Were both?

One could make similar observations throughout our country (and others). At the time I was growing up in Florida, lakes and streams all around the state were covered in water hyacinth (*Eichhornia crassipes*), an ecological disaster that still resists eradication, and has encouraged the well-meaning but short-sighted release of hundreds of thousands of non-native fish (mostly various tilapia species) to eat the hyacinths, which have now become problems in their own right. A great "natural" solution, right?

Aside from a few early teen-age trips to the Miami Seaquarium®, the first aquarium I recall that was not my own or in a fish store was in my 10th grade biology classroom, where there was a small (ten gallon?) tank containing a few cherry barbs and some plants. There was no filtration or artificial water movement, and only the usual classroom overhead lighting (though at certain times of the day some sunlight from a low angle would manage to illuminate the tank). Still, I was

intrigued by its simplicity and consistency of appearance. I do not know what the teacher (a Miss Breland) did about water changes or feeding, though I did see a small box of flake food on a nearby shelf. As a side note, I'm pretty sure that the school library is where I first came across "the Innes book" before obtaining a copy of my own.



A glass-bottomed boat glides along the water in Silver Springs, Florida. Once a major tourist destination, the springs have declined in both visitors and in water quality and volume. Photo from Greg Allen/NPR.

I have always been quite happy to have things like filters, pumps, lighting, and any other useful aids. So what do we mean when talk about a 'natural,' aquarium? We can all, of course, look in a book, magazine, or video to learn about the habitat(s) where a given species of fish might be found, and we can then try to replicate that look in our tanks. However, growing up in central Florida has left me with a certain perhaps skewed view of what "natural habitat" means in the modern world.

If you've ever visited Florida you'll recall that there are a lot of place names that include the word "Springs:" Silver Springs, Juniper Springs, Sulfur Springs, Salt Springs, and on and on.

In the days before Disney World, Silver Springs was a major tourist attraction. Several movies and TV shows were filmed there (**Sea Hunt**, **Creature from the Black Lagoon**, **Tarzan**, to name a few). There were popular glass-bottom boat rides to see the springs, along with a mind-boggling number of (mostly) catfish inhabiting them.

Things have changed. The last time I visited, the catfish were gone, other than a few big plecos (!), and the water was neither as clear nor as plentiful as it had been in years past. One of the guides told me that the construction of the Cross-Florida Barge Canal, even though finally aborted (Thank you, Richard



Macaca mulatta
Photo from Wikipedia.org
user Pradeep717

Nixon!), had caused major disruptions to the aquifer. The situation was further exacerbated by all of the people moving to that part of the state who are now drawing water for their homes, lawns and businesses.

An interesting relic of one or more of the **Tarzan** movies filmed at Silver Springs was a feral population of rhesus monkeys (*Macaca mulatta*), for years a boon to anthropology students at the relatively nearby University of Florida. There was also a beach for swimming in the springs, which was sometimes fun and sometimes less so. When the summer temperature is in the upper 90s, jumping into 72-degree water can be a real shock to the system! On the other hand, on cool days that same water felt wonderfully welcoming!

Geologically, Florida rests on a limestone base, which is very porous, and there is an abundance of fresh water flowing through this porous limestone. The water chemistry is mostly very consistent, though do remember the words “sulfur” and “salt” in the examples above. This subterranean water, often hundreds of feet below ground, is fairly hard (limestone, you know), and is a consistent 72° Fahrenheit year round. Great for brewing beer! Or for breeding tropical fish!

Not everything is known about the underground channels running through this limestone. There are those who believe that tarpon and snook use them to move inland to spawn and then return to the Gulf of Mexico. I haven’t kept up with the latest science regarding these speculations, but there is a *lot* of speculation.

The history of indigenous peoples in Florida is long, complicated, and somewhat mysterious, though more is known now than when I was growing up. I have read that since the days of Columbus, Ponce de Leon, and Hernando de Soto, water levels in the state have risen by at least twenty feet, so a lot of what historical anthropologists would like to investigate is now hidden under water. I have seen some accounts that in pre-Columbian times regular trade existed between the Mayans of the Yucatan peninsula and various central Florida tribes. There are many old place names in the state that include the word “Maya.” The history of those place names and tribes is still awaiting further study, though again, more is known now than was the case in my student days.

If you’ve ever flown over the state and looked down, you will have noticed that there are many, many lakes of all sizes and shapes, some connected, some not (depending on how much rain has fallen recently), and canals that have been dug from one lake to another to facilitate drainage and/or transport. So if you’re walking around in the boonies, or even in residential or agricultural areas, how dry your feet remain depends a lot on whether you’re doing so during the rainy season (roughly May through September) or the dry season.



Flooded pasture following Hurricane Jeanne. My sister once found the corpses of two walking catfish (*Clarias batrachus*) in this pasture following a long dry spell. We speculate that the roadside ditch (not shown in this frame) had dried out and they were searching for more water. Notice the ‘found art’ concrete blocks. Photo by Linda Konst

Besides ancient peoples, immigrants of European and African descent have been living in what is now Florida for hundreds of years, and there are remnants of that presence everywhere. You just need to know what you're looking at.

Less exotically, things that I used to come across while exploring the nearby “boonies” included many incongruous items, both in terms of plant life and “found art,” i.e., various sorts of dumped or abandoned junk. I remember one time a friend and I were exploring an overgrown, rather jungle-like area near where we lived (within the Tampa city limits) by a dredged-out “lake,” when we noticed that what we had wandered into was almost surely the remains of an abandoned plant nursery, with many of the apparently unsold species having taken root and become established as part of the local flora.

By the way, the word “lake” in Florida can be fairly broad in meaning and use. While there are nearly uncountable natural lakes throughout the state, in developed areas the lakes are more often the result of dredging sand from low-lying marshy areas to provide some elevation on which to build houses and other buildings, which will then of course have “lakeside views.”



Walking catfish (*Clarias batrachus*). Accounts seem to indicate accidental introduction to Florida waters. Photo from pinterest.com



Alligator (*Alligator mississippiensis*) taking a look around. Photo from Florida Fish & Wildlife Conservation Commission. Always good to keep your eyes open while slogging around in the marshes.

For fishkeepers, roadside drainage ditches can be very productive places for collecting both native and (more recently) introduced species. If you see a stretch of drainage ditch with wading birds stationed alongside it at intervals, that would be a very likely spot to try some collecting. You do need to be aware of the possibility of meeting venomous snakes or even alligators in the process, so do stay alert.

All of the above has of course had an effect on what I consider *natural* things to find underwater. I recall diving to the bottom of a small lake (probably man-made) and grabbing for some underwater plants to prove that I had actually made it to the bottom. Unfortunately, part of what I grabbed was a broken jar that peeled an inch or so of skin off one of my fingers, requiring an immediate visit to a surgeon for repair.

While I don't keep broken jars in any of my aquaria (once bitten, you know), they certainly are not an anomaly in nature as we now know it. So for me, “natural aquarium” décor can (and does) include many things: bricks, broken pottery, concrete blocks or pieces thereof, tree branches, leaves, and so forth. To me these all seem quite “natural.”



For those who would like more detailed information about the current state of Silver Springs and environs, I recommend the document, “Silver Springs Restoration Plan,” which can be found at:

https://floridaspringsinstitute.org/wp-content/uploads/2018/07/Silver_Springs_Restoration_Plan.pdf

It's 144 pages, but there is a very good Executive Summary!

DR



USING ROCKS EFFECTIVELY

by Dan & Mary Carson, GCAS

In contrast to the swimming of the fish and the growth of the plants, rocks lend solidarity and structure to your tank. They are invaluable for holding gravel into terraces, can be built into caves to shelter shy fish, made into backgrounds, or just simply used to enhance the tank.

The color and variety of usable rock is tremendous. A reliable retailer of aquarium supplies is your safest source. You can be sure that a pet shop will not sell rock that might be injurious to your fish. However, if you want, you can collect your own rocks. Most are perfectly safe, but a few do contain traces of minerals that would be toxic to the fish. If you gather rocks, scrub them thoroughly with a stiff brush and water. Get them as clean as possible. Then, treat them in one of two ways. Either soak them in a pail of clean water for a week, or boil them in tap water for 45 minutes. (If you boil them, be careful. Rocks hold the heat for a long time; handle them with tongs to avoid burns.)

If you have any doubts about the safety of a particular rock, you can test it by putting it in a tank with a few fish that you would not mind losing. Continue to care for the fish, as you do normally, for two weeks to a month. If the fish show no sign of distress, the rock is safe.

It is convenience, in arranging a tank, to have a large supply of rock - in assorted shapes, sizes and colors. It is much better to be able to select just the right one, rather than to have to use the only one you have left.

Rocks can be deceiving. The outside may be smooth and brown, and really not very impressive or attractive. Split open with a small sledge hammer and a cold chisel, it may have beautiful shadings, colorings or crystallization inside that will greatly enhance your tank. In breaking up rocks, save all the chips; they are useful in many ways.

In handling the rocks, learn to recognize the strata - the grain markings of the natural layers of the rock. When rocks lie naturally, the strata all runs the same way. Sometimes an arrangement looks quite good, but something seems just slightly wrong. It could be that the rocks are lying unnaturally - with the strata criss-crossed. (Figure 1) At first glance it seems fine, but the trained eye will recognize that rocks just wouldn't be lying that way. By turning the one rock, the appearance

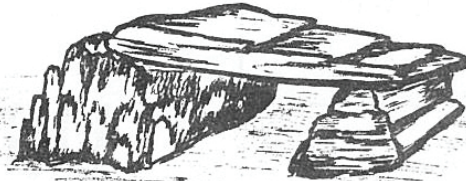


Fig. 1

is tremendously improved.



Fig. 2

(Figure 2) And as always, there are exceptions. Sometimes because of the shape of a particular rock, you have no choice. Some rocks show no grain at all, but rather an all-over crystal-like pattern. Then you can use them any way that they are most attractive.

In placing the main rocks in the tank, keep the "strata" all running in the same direction. However, chips broken from the main rocks can be scattered at random near the base of the rock, imitating the effects of erosion. Here, the strata would not follow a pattern. (Figure 3)

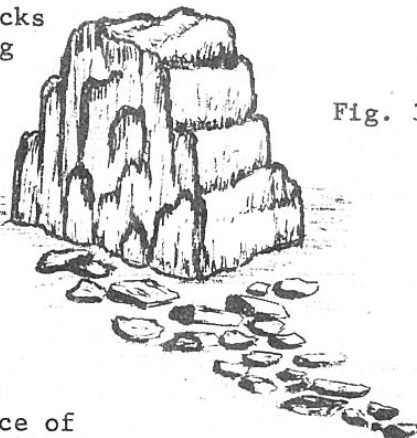


Fig. 3

In general, rocks look most natural, resting on their broadest bases. They are easiest to arrange this way. However, with practice, it is possible to use them on edge, embedding them deep into the gravel, giving the appearance of an out-cropping of a rock formation below the gravel layer. If you do this, be careful. They must be very securely buried, or they will slowly tilt and finally fall over!

Don't hesitate to use big rocks. One rock should not fill the whole tank, but it is surprising how large a rock will look beautiful in a ten gallon tank. One very large, several medium and a few little rocks, can be easier to arrange and more effective than many small ones.

Don't be afraid to bury your rock. They look awkward sitting on top of the sand (Figure 4), so push them into the gravel. If you are

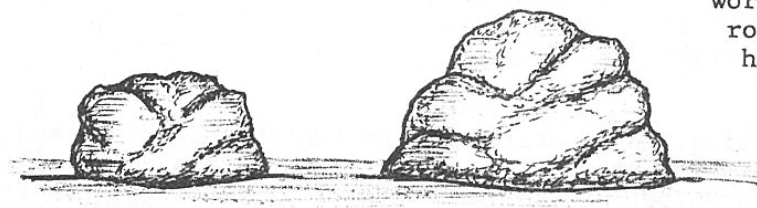


Fig. 4

working with very large rocks, it is better to handle your gravel and rocks simultaneously. Arrange a little more than half of the gravel in the tank, establish your main rocks, then

complete your gravel and smaller rocks.

Rocks in nature, generally have sand deposited against them where it was washed by the flow of the water.

Try to slope your gravel accordingly, and you will be more pleased with the total appearance. (Figure 5)

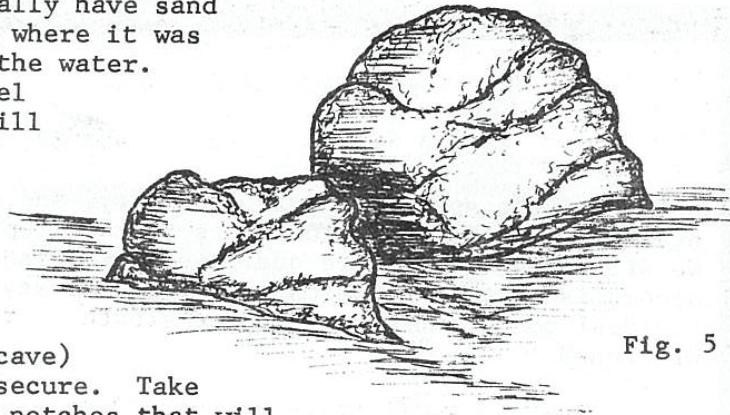


Fig. 5

If you are building rocks on top of one another (as in the construction of a cave) be sure they are very secure. Take care you do not create notches that will form traps in which fish can get caught.

Use the color of your rocks and gravel as an artist would use his paints. Let analagous colors blend; contrasting colors accent. But, be careful not to over-do the accent, or it will lose its effect. An entire red arrangement can become neutral - but one red rock in a neutral tank will catch your eye.

Another technique that can be most attractive is the discreet scattering of coarse stone chips on the surface of the gravel. This can be most effective if the stone is so similar to the gravel that it gives the appearance of a coarser gravel, drawn to the surface by the action of the water.

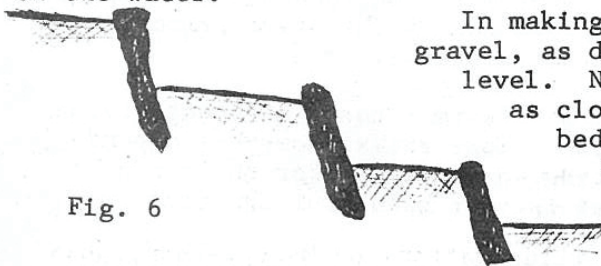


Fig. 6

In making a terrace, start with a layer of gravel, as deep as you plan the lowest front level. Now place your first row of rocks, as close to each other as possible, embedded to at least 1/3 of their

height, and leaning slightly back, to prevent their falling over.

(Figure 6) Rocks seldom mesh perfectly with one another, or

have such straight edges that they fit snugly against the wall of the tank. Fill the spaces with the chips so the gravel will now wash through. You generally have to add a little gravel, then more chips, and keep working up in layers to hold the chips in place. (Figure 7) If spaces are left between the rock, gravel will wash through when the water is added and destroy all your efforts.

CONSTRUCTION OF TERRACE
VIEWED FROM BACK OF TANK



Fig. 7

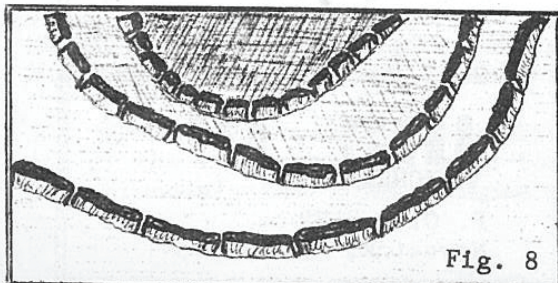


Fig. 8

When the first terrace is completed and the area behind it filled with gravel, construct another terrace on the next level in the same way that you built the first. If you want to get into extreme refinements, you can create a better illusion of depth by having the width of the rock decrease in the higher terraces. (Figure 8) Use your

ROCKS...

widest rocks in the front terrace, medium in the second, and smallest in the last terrace. It is the application of the basic principle of perspective that size decreases in the distance.

Plants will grow and the fish will swim - their movement giving them a grace and beauty of their own. Your rocks, however, depend entirely on your careful and tasteful arrangement for their contribution to the finished picture that is your beautiful aquarium.

illustrations by Mary Carson, GCAS

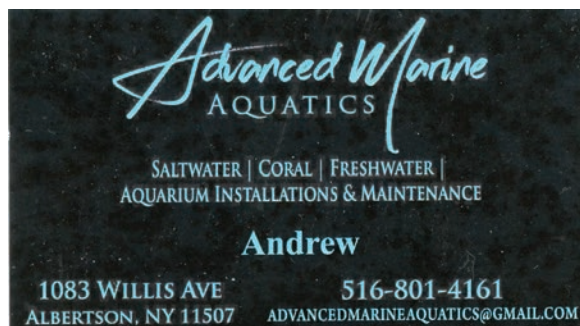


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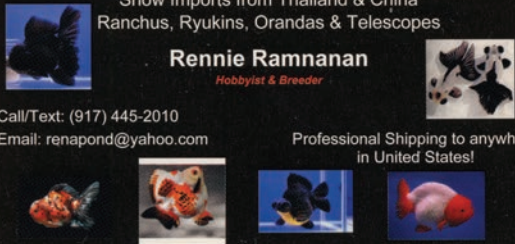
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August

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No meeting or bowl show in July

OFFICIAL 2020 BOWL SHOW TOTALS:

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Meeting times and locations of many of the aquarium societies in the Metropolitan New York City area. COVID-19 could cause cancellations! Check before you go!



GREATER CITY AQUARIUM SOCIETY

Next Meeting: Wednesday, September 2, 2020

Speaker: Peter Izzo

Event: *Getting to Know the Genus
Gymnogeophagus*

Meets: The first Wednesday of each month (except January & February) at 7:30pm:
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43-50 Main Street - Flushing, NY

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

BIG APPLE GUPPY CLUB

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

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

Contact: Donald Curtin (718) 631-0538



BROOKLYN AQUARIUM SOCIETY

Next Meeting: September 11, 2020

Speaker: Harry Faustmann

Topic: *Live Food*

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

NY Aquarium - Education Hall, Brooklyn, NY

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

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



LONG ISLAND AQUARIUM SOCIETY

Next Meeting: September, 2020

Speaker: TBA

Topic: TBA

Meets: 3rd Friday of each month (except July and August) at 8:00 PM.

LIAS Meetings are held at SUNY Stony Brook's Maritime Science area. Room 120 in

Endeavor Hall on the State University at Stony Brook Campus, Stony Brook, NY 11790

Email: president@liasonline.org

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



EAST COAST GUPPY ASSOCIATION

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

Environmental Ctr.: 228-06 Northern Blvd.

Contact: Gene Baudier (631) 345-6399



NASSAU COUNTY AQUARIUM SOCIETY

Next Meeting: TBA

Event: TBA

Topic: TBA

Meets: 2nd Tuesday of the month (except July and August) at 7:30 PM. Molloy College, at 1000 Hempstead Avenue, Rockville Centre, NY, in the Hagan Center for Nursing building, in the lower level, classroom #H006. See website for directions.

Contact: Harry W. Faustmann, (516) 804-4752.

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



NORTH JERSEY AQUARIUM SOCIETY

Next Meeting: TBA

Speaker: TBA

Topic: TBA

Meets: 12:30 PM - 3rd Saturday of the month, Clark Public Library in Union County, just off the Parkway at exit 135

Contact: NJAS Hotline at (732) 332-1392

Email: tcoletti@obius.jnj.com

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



NORWALK AQUARIUM SOCIETY

Next Meeting: August 20, 2019

Speaker: TBA

Topic: TBA

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

Contact: Sal Silvestri

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

Email: salsilv44@yahoo.com

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

Siamese Fighting Genes

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.

A study on *Betta splendens* has demonstrated that, as males spar, genes in their brains begin to turn on and off in a coordinated way. It's still unclear what those genes are doing or how they influence the fight's outcome, but similar changes may be happening in humans.

The molecular basis of how animals, humans included, coordinate behaviors is a mystery. Whether it be mating or fighting, “animals need to be really good at this, but we don't particularly know how they do it,” says Hans Hofmann, an evolutionary social neuroscientist at the University of Texas.

When molecular biologist Norihiro Okada at Kitasato University in Japan first saw Siamese fighting fish he realized they could help solve this mystery. Okada and colleagues videotaped over a dozen hours of fights between 17 pairs of fish and then analyzed what happened—and when—in each fight. The longer the fight, the more the fish synchronize their behavior, timing their circling, striking, and biting more than anyone had ever realized before.

They discovered that fights are highly choreographed, with battles lasting about 80 minutes, and with seemingly “agreed on” breaks between each move.

Reference:

<https://www.sciencemag.org/news/2020/06/fighting-fish-synchronize-their-moves-and-their-genes>

Bouts escalate every 5 to 10 minutes, when fish lock onto each other's jaws and hold on, a tactic that prevents breathing—and is thus a test of who can hold on the longest. The bettas then break apart to breathe, and the cycle begins anew. This coordinated behavior happens at a molecular level, too, the researchers found.

After 20 minutes of battle, five pairs of fish were sacrificed, and the researchers compared which genes were turned on in fish brains pre- and postbattle. They did the same for another five pairs after 60 minutes.

At 20 minutes, some of the same genes—“intermediate early genes” that turn on other genes—were active in each fish, the team found. At 60 minutes, hundreds more genes had coordinated expression. The timing

of when particular genes turn on is specific to each pair of fish, suggesting the pair's interactions are coordinating the cascade of changes. “They see a remarkable degree of synchronization,” Hofmann says.

Okada doesn't know exactly what these genes are doing or how they affect the course of the fight. The weaker fighter needs to be able to assess his opponent's strength and quit before getting hurt, and the genes may play a role in that, he suggests. But Hofmann and Bell suspect these genes have more influence on how the fish will respond to future fights with other fish.

And what we see in fish may apply to humans as well, Bell says. A study from the 1980s, for example, showed the facial features of married couples who had lived together a long time tended to look more and more alike. That, too, Okada says, may also signal a convergence of gene activity.

I've also read that, after a while, dogs and their owners start resembling each other, I wonder if I'm starting to look a bit “fishy?”



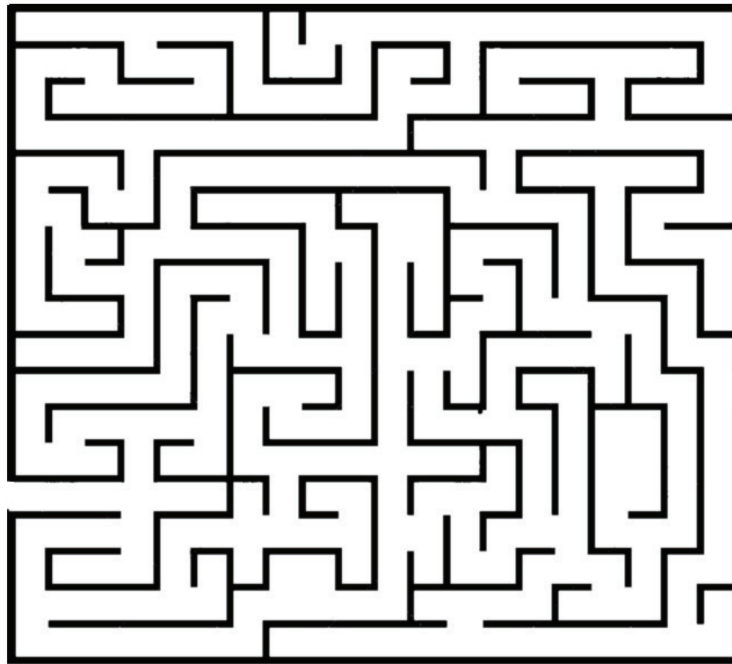


Fin Fun



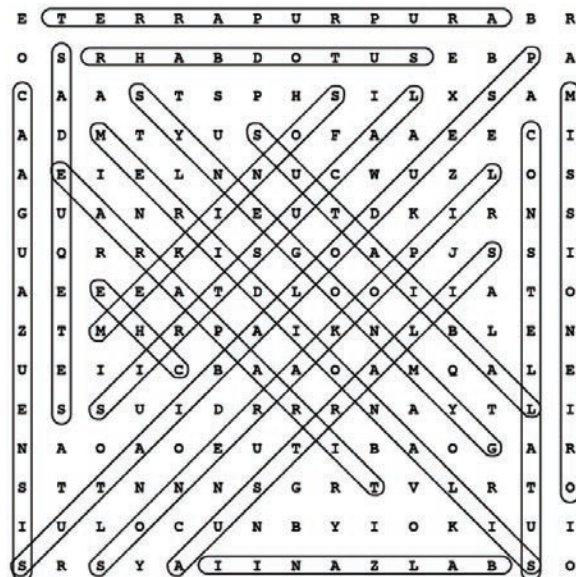
Who is That Masked Fish?

In keeping with current social distancing and facial covering requirements, help the fish (left) find his mask (right)



Solution to our last puzzle: Find the Earth Eaters

AUSTRALIS
BALZANII
CAAGUAZUENSIS
CHE
CONSTELLATUS
GYMNOGENYS
LABIATUS
LACUSTRIS
LIPOKARENOS
MEKINOS
MERIDIONALIS
MISSIONEIRO
PSEUDOLABIATUS
RHABDOTUS
SETEQUEDAS
TERRAPURPURA
TIRAPARAE





K.O.I.™ News!

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- Mycobacteriosis (one of the few diseases that can be transmitted by Koi to humans) by Diana Walstad
- The Science behind using Clay in Ponds by Syd Mitchell
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VOLUNTEER



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