

In Depth

December 2016

Montreal Fishrooms with Hans Evers

Zebra Danio Husbandry at NIH

Preparing Your Tanks for a Tour

Calendar of Coming Events

and so much more!



Visiting fishrooms on the way to Montreal with Hans Evers, Kenny Wai, Claude Gagnon, Loic Guidon, and David Banks. Story on page 6

In Depth

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We meet on the second Thursday of each month, September through June, at 6:30 PM at the VFW Hall, 73 Pearl St, Essex Junction, VT.

Our membership consists of adults, children and teens. Many members are very experienced and have been keeping fish for years, and others are just getting started. People of all ages and experience levels are always welcome. Meet and learn from those who share your interests!

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Black and snowball shrimp. Photo by Ann Whitman

From the President

by David L Banks, Jr



Another year comes to a close, a time to reflect on the past year and also to look to the future. There is so much we did as a club and individual fish keepers this past year. We just came off of a very full 4 weeks of fish time from our special meeting with Hans Evers, our annual auction and our November meeting, and also the Montreal meeting with Hans, the catfish convention in Washington, DC, and Aquatic Experience in Chicago. That is a lot for 4 weeks!

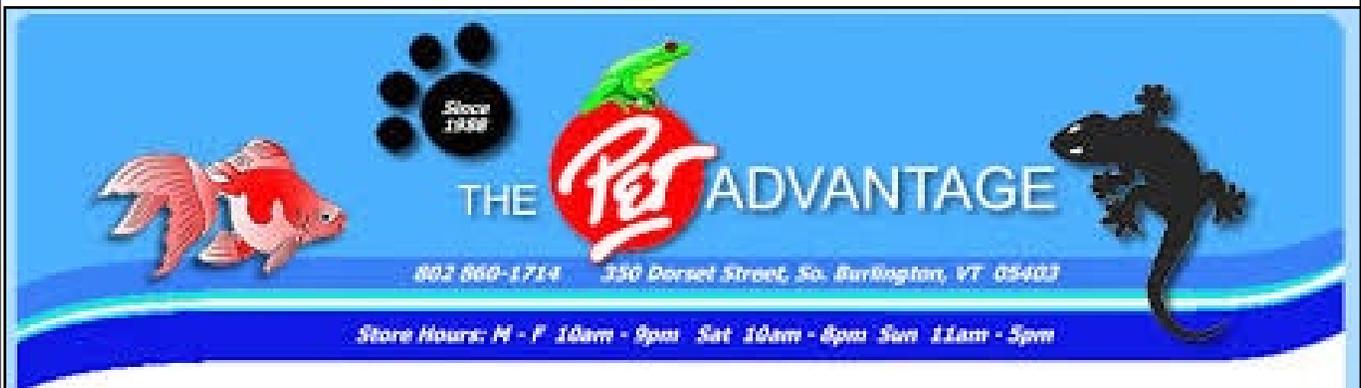
We have some plans in the works for 2017, but nothing finalized just yet. I've made initial inquiries to a few speakers, too, but again nothing confirmed yet. If anyone is interested in presenting a topic for the January or February meeting, please let me know. We can do several mini presentations during a meeting like we have done in the past, if you don't want to present an entire meeting. We can also just have informal talk, just like we have at the start of each meeting. We have not done that at a meeting for a long time now.

I am looking forward to our Holiday December meeting. Ann Whitman will be hosting this year at her house in Bolton. It is just 20 minutes from Burlington, so hope everyone can plan to attend. These meetings are always fun, we get to relax, eat plenty, visit with others and see Ann's fish! Plus we will also have a Yankee swap again this year, if you want to participate please plan to bring in a wrapped gift in the \$10 range to exchange with others. We have also done a trivia contest in the past, and this year will be no different. You don't need to know everything to be a winner, there are multiple prizes for things other than the most questions answered correctly!

I will be scheduling a board meeting in January, all are welcome to attend. We will work on what we want to do this coming year, talk about what we are doing and if any changes are needed. It is always great to get everyone's input. We have been having meetings about once a year, we probably need at least two, and that will be my goal for 2017, to have two board meetings.

Thanks to everyone for efforts to make 2016 such a success, and looking forward to 2017!

David



Editorial

Prepping for Fishroom Visitors

By Ann Whitman



I'm hosting our club's annual holiday party. Having advance notice that visitors are coming is a blessing and a curse. Unexpected company won't judge your housekeeping and husbandry as critically, and may even find self-congratulatory comfort the semi-organized chaos of your fishroom. (Wow, I thought my place was a mess.)

When you know beforehand that people are coming over to see your fish, however, the expectations are different. And when the visitors are members of your club or other fish people, the stakes are much higher than entertaining your neighbors and relatives. Your family just thinks you're nuts. The neighbors are impressed with your commitment, but mostly they want to reminisce about the tank they had when they were a kid, tell you about their neons and bettas, and maybe ask your advice on why everything died. Fish people, though, want a different experience when they visit. They came to see FISH.

They want to know about the unusual species that you keep and whether you are breeding them, and how. (And if so, do you have any for sale?) Rare species, impressive tank set-ups and aquascaping earn cudo points. Serious fish keepers will look at fishroom mechanics and ask questions. Water chemistry and cleanliness, filtration, feeding, fish sources, lighting, equipment and DIY projects are all on the table. Yes, preparing for a visit from fellow fish-keepers requires more work than a weekly water change.

Here's my pre-visitation checklist:

- All water changes done this week, algae scraped off front glass (anybody in there?)
- Plants trimmed, culled and replanted (black beard algae bleached)
- Filter cartridges changed, sponge filters rinsed (sounds like a waterfall? It's overdue!)
- Glass lids washed on both sides (no wonder the tank seemed dim)
- Driftwood and rocks added, rearranged (pull out the aquascaping magazines)
- Windex tank fronts and shelves
- Pick up and put away buckets, hoses, nets, bags, equipment and other tripping hazards
- Bonus points: add or update species labels on the tanks (you do remember the species, right?)

Depending on the number, size and condition of your tanks, getting through this checklist can take some time. My advice: multiply your usual weekly maintenance time by three or four, and get started ASAP. With 30+ tanks in my house and our annual holiday party coming up this week, I got busy last week. When all the work is done, I'm taking pictures to remember how it looked for just one night in December 2016.

Ann

CALENDAR OF COMING EVENTS

Dec 8	TFCB Holiday Party, 6:30, Ann Whitman's house, Bolton, VT
Jan 12	TFCB meeting, 6:30, VFW, Essex Jct, VT
Jan 15	Danbury Area Aquarium Society auction, Carmel, NY
Feb 19	PVAS Tropical Fish auction, Chicopee, MA
Feb 25	Tropical Fish Society of RI , Spring auction, Cumberland, RI
March 10 - 12	NEC 42nd Annual Convention , Rocky Hill, CT
March 10 - 12	Capitol Cichlid Association, Big Fish Deal #5 , Gaithersburg, VA
March 25	NH Aquarium Society auction, Portsmouth, NH
April 23	New Jersey Aquarium Society , Spring auction, East Brunswick, NJ
April 28 - 30	Aquatic Gardeners Association Convention , Denver, CO
April 29	Central NY Aquarium Society , annual auction, Syracuse, NY
May 4 - 7	American Livebearers Association Convention , St. Louis, MO
May 12	Brooklyn Aquarium Society Giant Spring auction, Brooklyn, NY
May 21	OVAS , annual auction, Rutland, VT
May 26	American Killifish Association Convention , Northbrook, IL
June 8 - 13	North American Native Fishes Assoc. Convention , Missouri
July 13 - 16	American Cichlid Association Convention , Novi, MI
August 25 - 27	Marine Aquarium Conference of North America , New Orleans, LA
Nov 3 - 5	Aquatic Experience , Chicago, IL



A Trip to Montreal with Hans-Georg Evers

By David L Banks Jr

Hans was going to be speaking and attending the All-Aquarium Catfish Convention in Washington, DC, and since he was going to be in the U.S. already, we invited him to come a few days early and speak to our clubs in Burlington and Montreal. He graciously accepted our offer and we planned a large combined meeting for TFCB and OVAS on Tuesday night. On Wednesday, we would go to Montreal before heading down to the catfish convention on Thursday. Since hopefully most of you were at the TFCB/OVAS meeting, I will concentrate on our day trip to Montreal.

First Stop: Claude Gagnon

We were up early and Hans and I headed north. We had a busy, although flexible, schedule planned. Our first stop was to pick up a long-time TFCB friend, Claude Gagnon. Claude came to one of the first TFCB meetings back in 1989, and Janine and I quickly became good friend with Claude and his wife, Evelyn. Claude was a major breeder in the SAM club in Montreal at the time, and travelled down to our meetings a few times a year, and we travelled up to their meetings and auctions, too. After the ice storm in 1998 and lengthy power outage, Claude took a long break from fish, but his fishroom was still intact ready to be activated again. He kept talking about maybe setting up just one tank, and he finally did that, and eventually was bitten by the fish bug again, bringing his fishroom up to nearly full speed over the next couple of years. He was back again breeding many species, including many catfish.

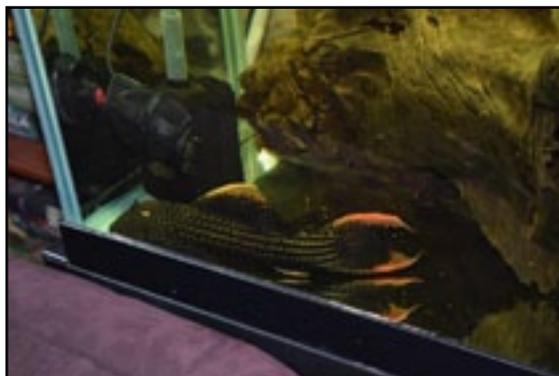
When Hans and I arrived, we got a quick tour of Claude's fishroom. He had knee surgery recently, so it was a fairly quick visit, although he had a few spawns and groups all ready to breed. We had arrived right on the scheduled time, and we were ready to go off to our next destination.

Pleco Collector: Loic Guidon

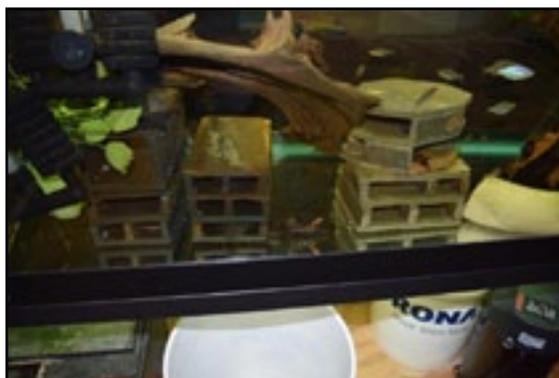
Loic Guidon lives in the same town as Claude, and we had been given his name from Francois Blondeau. I didn't recognize Loic by name, and neither did Claude, but he lived close and had lots of plecos and was available that morning. When we arrived he greeted us with his friend Kenny and we proceeded to see his fishroom in the lower level of the house. Here he had many large tanks, full of very cool and interesting plecos! There were pictures being taken, and discussions about the fish. His tanks were all planned around plecos, some very large species, but mainly many of



Hans took pictures of Loic's tanks in the fishroom downstairs.



Cactus pleco in one of Loic's tanksv.



Pleco condos

the medium 6" sized ones. There were a few other species too, but his main interest was definitely plecos! We thought we were done and getting ready to go, when he said there is more upstairs.

Upstairs he had one 6-foot tank and another of about 70 gallons. The 6-foot tank was loaded with many different species of the smaller plecos. It was amazing to watch as he fed the tank, they would all come out of their hiding places in search of what was being offered. His parents were also visiting from France, and come to find out, his father also has several fish tanks, and he was planning to come to the meeting that night with Loic. There were photo ops with all of us, as well as trying to get photos of the fish as they dashed about. It was great meeting Loic and Kenny, in fact they both attended our TFCB auction on 10/30.

Fish in Tight Quarters

From here we went to see Francois Blondeau in Montreal. We did very well and found a parking spot almost right in front of his building. His apartment is very small and full of fish tanks, wherever he could fit them in. He had lots of different species of corydoras catfish, some very nice red guppies, and an assortment of a few other species. And lots of live aquatic plants, some even growing emersed in an



All gathered around Loic's 6-foot tank upstairs.



At Francois' home, Hans and Francois talking cory cats. Notice the plants growing emersed.



One rack of Francois' tanks...



One of the many different species in one of Loic's tanks upstairs



and more tanks everywhere!

almost paludarium setting! Again, once he started to feed the tanks, corys came out of hiding and were everywhere.

Francois hatches cory eggs using snails and has experimented with different ones and found what seems to work great for him. He presented his findings at our November 2015 meeting.

From there, Hans, Claude, Francois and I went for lunch at the “Le Roi du Smoked Meat”, the king of smoked meat! Francois said it was only a two-block walk, maybe it was closer to four or five! Smoked meat is a Montreal specialty so we had to have some while Hans was there. After lunch we stopped at “Aquarium du Nord” as we were walking right by it, and Francois works here part time. This store has been around for a long time and always has an interesting assortment of fish, things you don’t see in most stores.

Siteseeing in Old Port, Montreal

Next was off for some sightseeing! We headed to the Old Port area of Montreal. I had been there several times, and we had walked around looking in the shops and eating, but I realized I had never actually been down to the water. There were people everywhere, it was a gorgeous sunny fall day, and the maple trees were in full color. It was a great setting next to the river, and Hans was running around getting the best photos he could. After much walking around, we ended up at a nice pub with outside seating and enjoyed a round of beers and watched as the bus loads of tourists flocked by. No one was hungry yet since the smoked meat platters were huge and we had eaten lunch late.

Hans Presents to the MAS

We arrived to the fish club meeting place early and setup for the program, since they start their meeting with the speaker. We met and spoke to many of the members, and Loic, his father and his friends also came in. Hans spoke about collecting plecos in Peru and Brazil and, as I mentioned in my president column last month, there were good times, but also lessons to learn. After a day of collecting some very nice plecos, they retired to their host’s home, only to find the next morning that their plecos had been used to make soup!

The MAS president, Jim Cartier, asked me to auctioneer for them. They use a slightly different auction method than we use, so I had to adapt to get the hang of it, well mostly anyways. The Montreal Aquarium Society has many door prizes for members, and they also sell raffle tickets at each meeting with many prizes. The meeting got over a little early, and many hung around chatting in the room, and then again more outside. Our last stop on this trip to Montreal was at a Tim Horton’s for a coffee and bagel, a good ending to our trip.



Francois’ corys at feeding time



Hans giving his presentation on his Pleco Collecting Adventures to the Montreal Aquarium Society.



Hans’ talk brought a good crowd to the MAS club meeting and generated a lot of discussion afterward.

Zebrafish Husbandry and Research at the NIH

By Ann Whitman

Manuel, our guide from PVAS, led our group of 20 hobbyists from the All-Aquarium Catfish Convention through the locked gate, past the guards, security checkpoints and body scanners and into the visitor center where we were photo-IDed and issued numbered badges with our pictures on them. Security at NIH is tougher than TSA! We were here in Bethesda, MD, to tour the National Institutes of Health Zebrafish Facility and learn how the NIH maintains its fish.

Why Zebrafish?

After walking through the campus to Building 6, Manuel turned us over to an NIH staffer who explained what we were about to see and why zebrafish (aka zebra danio, *Danio rerio*) are so important to scientific, and especially health, research. Zebras have a fully sequenced genome and share 93% of the same DNA as humans. They mature quickly, are easy to breed and maintain, and their transparent embryos are particularly easy to observe and manipulate. Zebra danios are used extensively by biological scientists in genetics, cancer, neurobiology, reproductive and developmental studies, and more. For more on zebrafish in scientific research, see Wikipedia and the [NIH website](#).

As fish hobbyists, our tour was focused mainly on husbandry: spawning, rearing, feeding and water quality for up to half a million fish zebrafish. NIH is a scientific facility, so all aspects of keeping the fish must be tightly controlled and data driven because all research results must be reproducible. Any change in the fishes' diet, temperature, water parameters or lighting could skew research, results and conclusions. They run a tight ship!

After the introduction, we divided into two smaller groups and headed down the stairs into the heart of the breeding and maintenance facility with two guides who work directly with the fish. Tom, my group's leader, took us first to the huge room where the fish live in 4,000 polycarbonate tanks. The 1, 2 and 6-liter custom tanks are made in California. For easy maintenance, the tanks are designed for automatic and constant water changes from an overflow system. Clean water drips in through tubing at the front, and overflows into a gutter drain at back, resulting in 12% water change daily.



Just one side of one row of 1-, 2- and 6-liter tanks full of zebrafish.



The polycarbonate tanks, by [Aquaneeering](#), are designed for efficient operation and maintenance and can be autoclaved for sterilization.



Water drips from the plastic tubes and overflows out the back into a collection gutter, achieving a 12% daily water change.



High water quality and constant water changes allow dense populations of adult zebra fish to live in close quarters.

Water and Lights

Filtration and water quality are paramount for fish health and NIH devotes a lot of space and resources to it. They filter 3,200 gallons per day and all the water is recycled through a massive, 2-storey, multi-stage filtration system.

Stage 1: New city water that's added to the system undergoes reverse osmosis and is remineralized before mixing with the dirty, overflow tank water.

Stage 2: Mechanical particle filtration through either a bead filter or Filtrex system.

Stage 3: Biological filtration through a Fluidized Bed Filter of silica sand.

Stage 4: UV sterilization by high intensity UV bulbs enclosed in stainless steel tubes.

Lights are designed to simulate natural, 14-hour days and are timed to gradually come on at 8:00 and fade at the end of the day until they go out at 22:00. The entire fish room is kept at 80°F. For the people who work here, this is a hot and steamy job!

Disease Control

In a closed loop system like this one, a disease outbreak could be devastating. To monitor for potential problems, researchers keep two groups of sentinel fish in different parts of the system where they are exposed to both clean and dirty run-off water.

If new fish are introduced to the system, they come in as eggs. The eggs are bleached to remove the egg shells, which could carry pathogens, and then the newly hatched fish are quarantined.



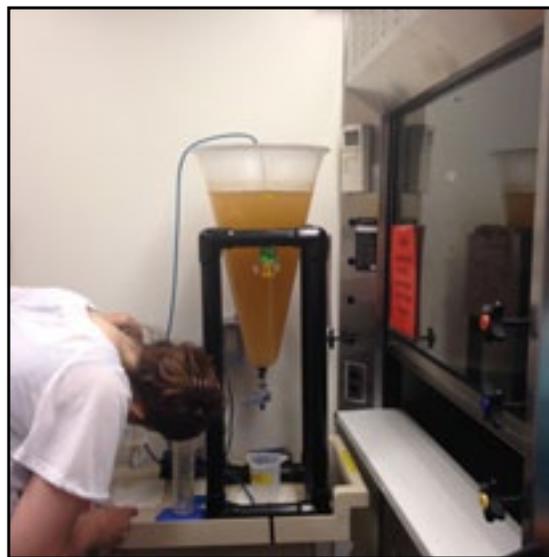
Biological filtration is just one phase of the extensive water treatment and recycling system.



UV filtration is the last stage of treatment. Each of the four stainless steel chambers holds 13 high-intensity UV bulbs.



Rotifers are grown in huge tanks of 16.5% saline water. They are fed to fry as first food.



NIH uses San Francisco Bay brand brine shrimp eggs and sets up new hatches every 12 hours.

Feeding Time

The day their egg is fertilized is Day One in the life of a zebrafish, and their feeding regime is programmed day-by-day until they reach adulthood. Feeding the fish is a full-time and demanding job. Fry are fed live rotifers for the first 9 days, then on day 9 they are switched to [Gemma](#) micro powdered food and newly hatched brine shrimp. By day 24, the beginning of the juvenile stage, they are getting 6% of their body weight in food per day, split into two feedings. The combination of constant water changes, strong aeration, and heavy feeding brings the fish from egg to adulthood in just two months. At the adult stage, fish receive 3% of their body weight in food each day. To meet the demanding need for speed and accuracy while dispensing a range of different foods and particle sizes, NIH uses a [DIY handheld feeder](#) that allows staff to feed each fish tank more quickly and precisely.

They decap their own San Francisco Bay artemia eggs, using the bleach method, then refrigerate the eggs in high saline water to prevent hatching until needed. They start two cultures a day (at 76°F) and feed the nauplii at 24 hours old, before they molt and lose nutritional value.

The rotifers are grown in two huge tanks of 16.5% salinity water. They feed them [Reed Mariculture Rotigrow](#)® and harvest 30% of the rotifers from one tank each day. Before feeding to the zebra fry, they wash the rotifers to bring down the salinity to 5%.

Breeding

One of the most personally useful things I learned at NIH was how they breed the zebrafish. The fish spawn at dawn, so they set up groups in spawning tanks the previous afternoon. The small breeding tanks have slotted bottoms for the eggs to fall through. They place this tank at an angle inside another tank to simulate the shallow water near a beach. They breed the adults every two weeks.



The angled tank replicates a shallow beach zone where zebras typically spawn. Eggs fall through slots at the bottom.

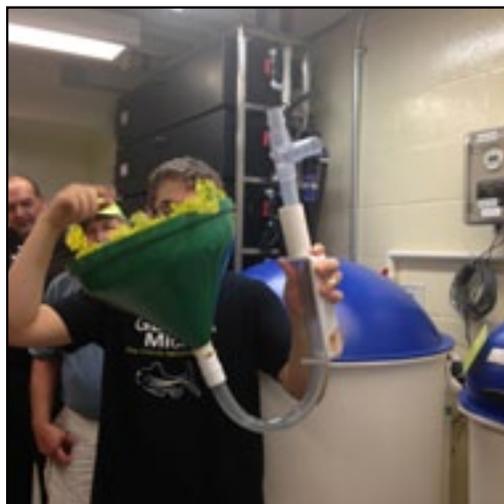


For some scientists, the exact age of fish embryos is critical. They keep some fish in light-sealed cabinets where the time of artificial dawn and start of spawning can be customized.



This large, light-sealed tank holds 2,500 wild-type zebrafish used for out-crossing.

They also keep a wild-type population of 2,500 zebras in a large tank for out-crossing. They breed this group twice a week and can harvest 75,000 eggs over a 5-hour period. They invented a nifty DIY breeding cone and airlift collector mostly from parts they found at Home Depot (see photos). The green color is particularly attractive to the spawning fish.



Built from parts found at Home Depot, this breeding cone is placed inside the light-sealed tank twice a week. Eggs are air-lifted through the tube and into a collection cup with a 400 micron mesh bottom.



The top of the breeding cone is covered with mesh and plastic plants to encourage spawning over the collection area.

I was surprised to learn that everyone who works with the fish in the NIH zebrafish husbandry area has at least a Bachelor's degree and is working toward further certification. Their ability to maintain such stringent practices and protocols is critical for the research that scientists are doing with the zebrafish. These little fish are providing answers to long-puzzling biological questions and giving hope for cures to many debilitating diseases. Seeing another side to fish-keeping was an eye-opening and marvelous experience for all who had the chance to get this behind-the-scenes tour.