

modern AQUARIUM



September 2016
volume XXIII
number 7

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modern AQUARIUM

Series III Vol. XXIII, No. 7 September, 2016

ON THE COVER

In an issue devoted to fish behavior, I thought the cover ought to reflect that theme as well. Overt curiosity has long been normal behavior in this tank (though not universal, as you can see by the left-wing holdouts). Not visible in the frame, I am kneeling by the right hand side of the tank, pretending to be messing with electrical wiring on the floor. Enquiring minds seem to want to know. I find it interesting and consistent, but I make no other claims. Your explanation is probably as good as mine.

— Editor

Photo by Marsha Radebaugh

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From the Editor

by Dan Radebaugh

This is the first deliberately themed issue since I have been Editor of **Modern Aquarium**. There have been others in the past, perhaps most notably a “Ladies Issue” that featured not only female writers from our club, but from all around the country. If you’re curious you can find it online. See our web site, GreaterCity.org, and go to the May, 2003 issue.

The reasons for this present “Do Fish Think?” issue are several. First of all, there’s been enough research in recent years to actually begin to make some statements that can’t be dismissed as ramblings of the uneducated. My original intention some months back was to review a book by Virginia Morell called **Animal Wise**, in which she visits with and chronicles the work of several scientists studying various creatures, including fish. However interesting the chapter on fish intelligence was though, it was just one chapter, so it seemed a bit of a stretch to review just one chapter.

Having said that, I must also say that Ms. Morell presents this diverse material in such a way as to show that, despite the diversity of subjects—ants, fish, birds, dolphins, dogs and wolves, chimpanzees and gorillas, elephants and rats, a common theme does emerge, namely that our (*Homo sapiens*) view of the rest of the animal kingdom (let’s not even get into plants) is very much affected by the “haze of good will” (apologies to J.B. Priestly) through which we have viewed ourselves through the centuries. Even considering only the single chapter on fish, this book raises some interesting questions—the whole book even more, and the chapters do in the end all tie together.

The view that animals (other than us) don’t have souls or minds goes back in Western culture at least to the views of Aristotle and Plato, and although most of their opinions on the physical realm are not paid much attention any more. When was the last time you’ve heard a lively discussion on the Doctrine of the Celestial Spheres? Somehow we rather like the idea of ourselves being in an entirely different category from all other earthly beings, notwithstanding our general acceptance of the theory of evolution.

So, do non-human animals think? Do they have emotions? In ethologist Marc Bekoff’s book, **The Emotional Lives of Animals**, he makes the case that emotions are something that we’ve inherited through evolution, just as we’ve inherited other systems and/or structures, and that they serve a purpose in our lives

from ECCLESIASTES 3

I said in my heart concerning the estate of the sons of men, that God might manifest that they see that they themselves are beasts, for as one dies, so does the other. They all have the same breath, so that a man has no preeminence above a beast. So all is vanity. All go to one place; all are of the dust and all return to dust. Who knows whether the spirit of man goes up and the spirit of the beast goes downward under the earth?

as well as in the lives of other animals. And it doesn’t take an advanced degree to notice them. Students in animal behavior are taught to identify signals of various emotions displayed by the creatures they are studying, and (other) studies have found that lay people are just as likely as scientists to correctly identify what specific emotions their subjects are displaying. So if it seems to you that your dog (or your Oscar) is happy to see you, you’re probably correct.

Each of the articles you will read in this issue contributes something to our knowledge and understanding of the creatures we keep in our aquaria. Maybe none of them is a complete answer to the larger question of “How smart are they?”, but as Dr. Bekoff has put it, “the plural of anecdote is data.” Enough verifiable anecdotal data might inspire some scientist somewhere to set up a study to prove or disprove whatever the implied assertion might be.

If you’d like to do further reading on this subject, below is a short list of titles, some of which have been around for quite a while; others are of fairly recent origin. This is by no means a comprehensive survey, but all are good reads. You might even see a couple of these as door prizes at tonight’s meeting!

Animal Wise	Virginia Morell
Do Fish Sleep?	Judith Weiss
Fish Behavior	Stéphan Reeb
King Solomon’s Ring	Konrad Lorenz
What a Fish Knows	Jonathan Balcombe





GCAS Programs 2016

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

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

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

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

President's Message

by Dan Radebaugh

After sagging a bit for a few years, attendance at our annual Silent Auction/Flea Market has now been up again last year and this year. It's a different flavor than our usual meetings; we all mill about for a couple of hours, looking over the auction items and shooting the, um, breeze. Then we ring the bell, the auction is over, we pay our money and go home early with our loot. Piece of cake!

While I was very gratified by the increased turnout and the congenial atmosphere, we (the Board of Governors) have recently had some discussion about changing the format—making it more of a classic “big auction.” The thought is that this format would possibly generate more income for the club. Also, until this year, where I did see a strong increase in the number of fish being sold, the Silent Auction has been more of an equipment clearinghouse.

The Board will continue to discuss this idea. We all want to do what is best for the club. If you have any thoughts on this subject, please do let me know. If you can't buttonhole me at a meeting, my email address is listed in your copy of Modern Aquarium, at the bottom of page 3. Thanks in advance for your input.

Dan



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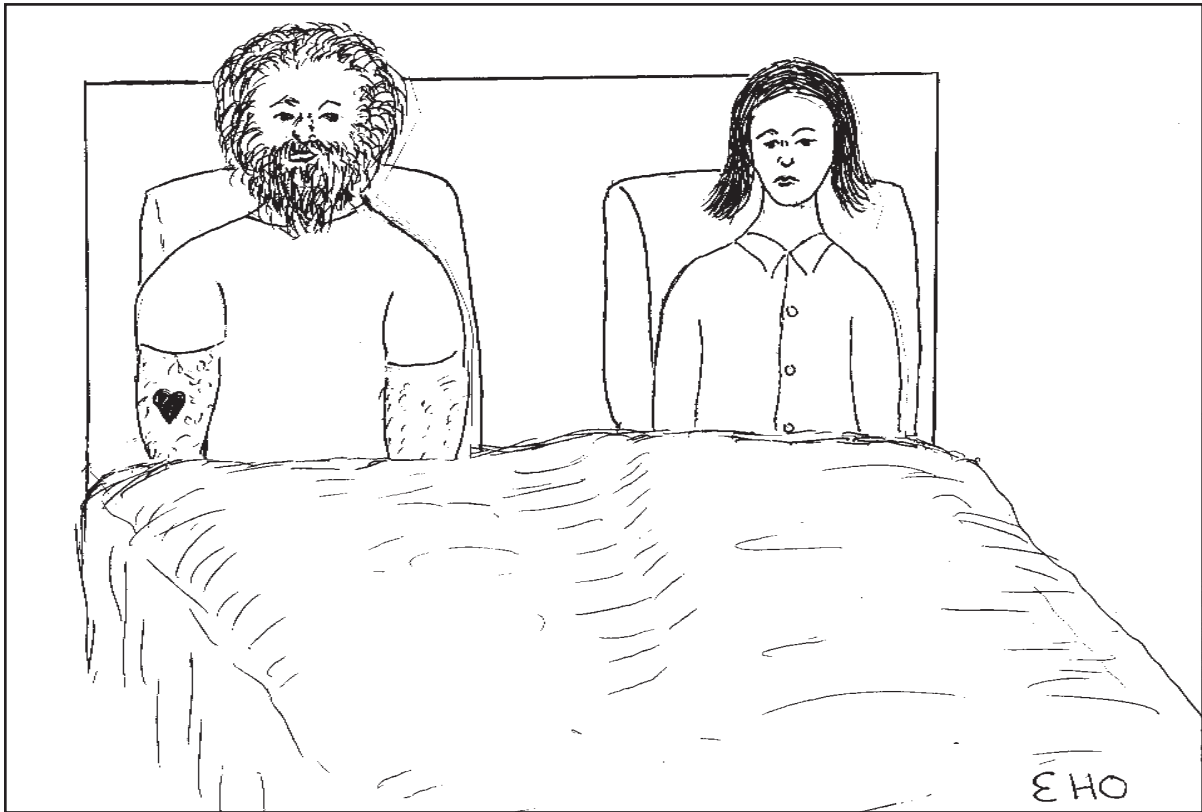
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August's Caption Winner: Marsha Radebaugh



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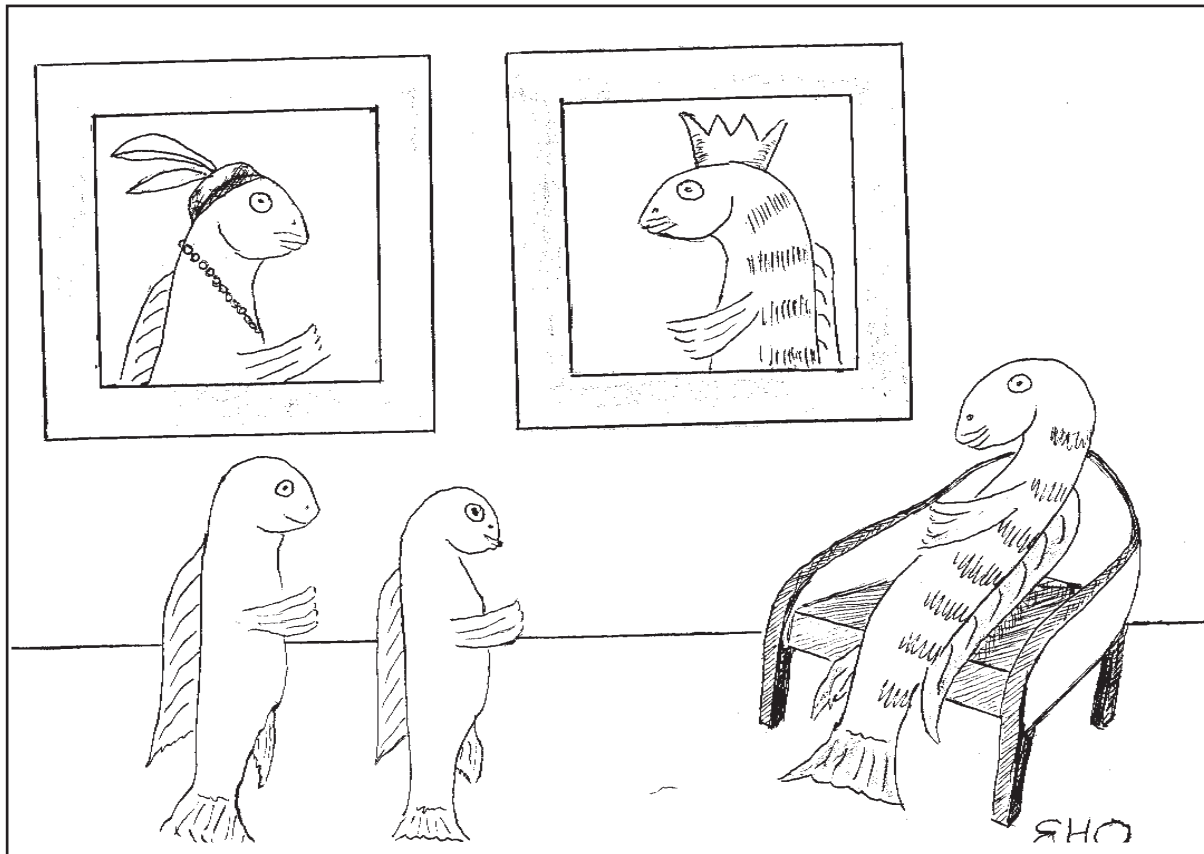
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The Modern Aquarium Cartoon Caption Contest

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



Your Caption:

Your Name:

Do Your Fish LIKE You?

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.

The most popular aquarium hobby magazines all seem to be agreed on a few points. Of course as the resident GCAS curmudgeon (and under the veil of anonymity), my opinion often differs. One of the areas that nearly, if not all, of the magazines agree on is that "mutts" (read that as crossbreeds) are bad. I think I'll tackle that issue in another column, but at this point I'm not willing to go that far. Some of the oldtimers in this hobby may remember when the currently very popular (and very attractive) double-tail betta was hotly contested. And let's not forget that crossing *Xiphophorus helleri* (swordtails) with *Xiphophorus maculatus* (platies) have given us such hobby staples as the tuxedo sword, wagtails, and high fin varieties of swordtails, including high fin lyretails. But as I mentioned, this discussion of "mutts" will have to wait for another issue.

This month I want to discuss anthropomorphism. Anthropomorphism is a big word which basically means attributing human feelings and motives to something that is not human. I've seen articles discussing territoriality and aggression in fish, and in the same magazine issue someone may write in asking if two fish of different species who seem to be tolerating each other can be "friends." The answer is usually "no—they've become habituated or accustomed to each other." Well, how does this smartypants editor know that these fish aren't friends?

I've read that in Japan some koi kept in ponds not only seem to recognize their particular owners, but they will sometimes allow themselves to be called and even petted. As the Editor of *Modern Aquarium* seemed to hint at a few months ago, when a dog wags its tail to greet us, we see this as a sign of affection and intelligence. Yet the same "greeting" behavior from an angelfish or molly is always viewed as a food gathering instinct, and nothing more. Why? We accept the fact that humans form pair bonds. In fact, at one time when human pair bonding was discussed, it was generally understood to be a lifetime commitment. But with the divorce rate growing as rapidly as it is today, some animals form longer duration bonds than do most humans. As any fish breeder will attest to,

just having a male and female of the same species is no guarantee that a successful breeding will take place. I know a betta breeder who has bred bettas that refused to eat live worms or live brine shrimp, preferring dried flakes and dried worms. Apparently, this is a rare exception in this species. Yet aren't these rejections (of potential mates or of certain foods) evidence of a fish selectively showing that it has preferences, likes and dislikes? If a fish can have preferences in a mate or its food, why is it so hard for us to believe it can not also have similar preferences (read this as "friendships") with fellow tankmates? Why can't fish even have preferences among its caretakers/owners? Maybe it's just that we don't want to think about the possibility that they can be judging us! Why is it so hard to accept the possibility that a fish can "enjoy" the company of people? Don't we enjoy seeing them? Deriving pleasure from observing interesting behavior is not exactly meditating on the meaning of life. I've known dogs and cats that will sit transfixed watching cars and people, or even watching television.

My betta breeder acquaintance showed me an article that appeared in the newsletter of the Bettas Buffs of Pittsburgh in February 1992. This article, "A Tribute To Valentine" by Nancy Carr, was reprinted by the publication of the International Betta Congress last year. Ms. Carr eulogizes a betta she named Valentine ("Val" for short) who would voluntarily swim into a cup in order to be placed in a maze, an activity that, by his objective behavior (as perceived by the author of the article), Val demonstrated he "liked." Additionally, Ms. Carr wrote of Val, "He was curious about everything that went on around him." Was she deluding herself? I think not, but then again I think it doesn't matter.

Naturally, we have to be careful not to infer too much from the observed behavior of fish. Yet I read that introduction of another male cichlid or another female betta in a breeding tank can spur spawning behavior. So why can't we infer jealousy? If we see a fish that normally swims around in the front of a tank is now hiding in the corner, we often (correctly) infer that the fish is either sick, pregnant or egg laden (if female), or the target of some aggression by one or more of its tank mates. I'm going to suggest that it's O.K. to go even one step more and attribute "human" (although perhaps childish) motives to fish.

If a healthy fish rejects certain foods that most of its species are known to eat, but eats other foods, the best explanation is individual preference. If a fish guards an area where its eggs or fry are, why not call this maternal or paternal behavior? True, it may be "instinct," but this might apply in the case of humans as well. If we're willing to concede this, then why can't we at least admit the possibility of fishes feeling love, hate, interest, boredom, joy, etc.? Haven't we all seen fish that learn from past experiences? That fish we netted so easily last month now seems to "know" that the net means forcible ejection from its

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comfortable little world. (And ever notice it seems that all the other fish know you're not after them?) Put the net away and the object of your netting attentions seems to magically reappear (teasing you?).

It's only by assuming that other people have similar motives to our own that we can function in this world, given that so few of us are mindreaders. Sure, we often make mistakes and assume the wrong motives are behind someone's action. That, (among other things) is how wars start. If you prefer to believe that your fish have taken a real liking to you for more reasons than their daily feedings, don't let anyone talk you out of that notion. You'll be a better pet owner with that attitude, and your fish will probably do better. Who knows, you might have been right in your assumptions after all? (While both I and my spouse "know" that fish don't have eyelids, my spouse nonetheless swears that at least one of our Corydoras winks at us; and in a figurative sense, that might be true.)

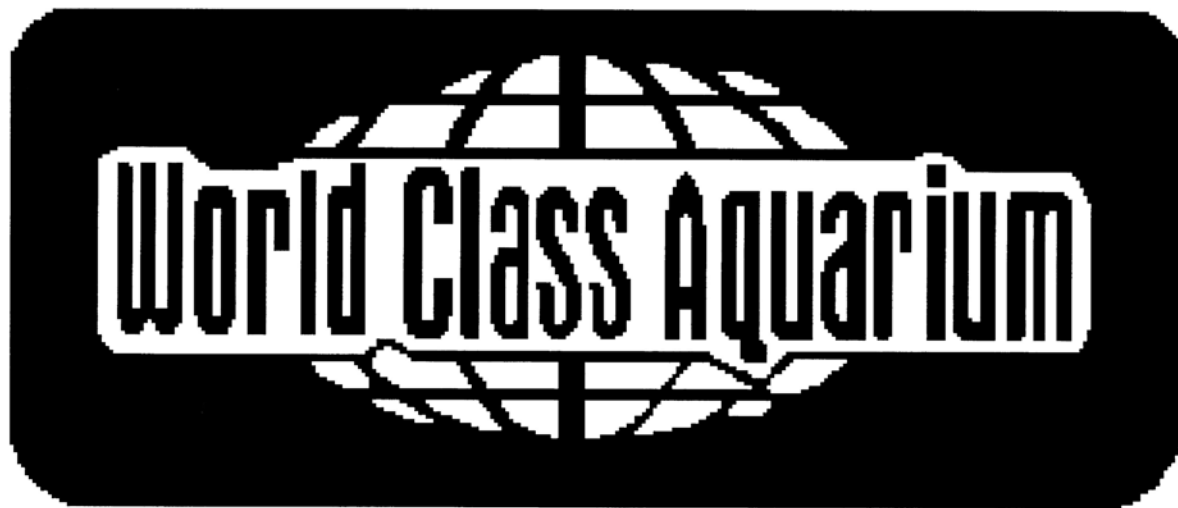
So, if you feel that your elephantnose fish likes you to pet her (and her behavior seems to support this), don't let so-called "experts" tell you otherwise. It's your fish after all, so why shouldn't you know more about her than the "experts" do? It's only through our

own observations and our feelings that we humans can relate to and arrive at an understanding of our world. Of course, we may make some totally wrong assumptions, but that's part of being human too.

Look at it this way, your fish tank is part of your world, isn't it? Well, isn't the area outside the tank (whether in your fish room, living room, or wherever) also part of your fishes' world? If you like to watch your fish, might it not just be possible that at least one or two of your fish are interested in watching you? Then who is the observer? Perhaps both of you. Einstein proved it doesn't really make any difference whether we assume the sun rotates around the earth, or the earth around the sun, since any point can be considered fixed in relation to another.

So, as I've been saying in most of the articles I've written for **Modern Aquarium**, let's not take ourselves (either as individuals, aquarium hobbyists, or as species *Homo sapiens*) too seriously. Believe whatever seems to work for you and for your fish, and act accordingly.

In other words, if it works for you, use it. Because, as Einstein might say, "It's all relative."



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Fishy Friends' Photos

by Greater City Aquarium Society Fishy Friends

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



Bob Fisher



Joe Gurrado



Gilberto Soriano



Dan Radebaugh



Ruben Lugo



Michael Vulis



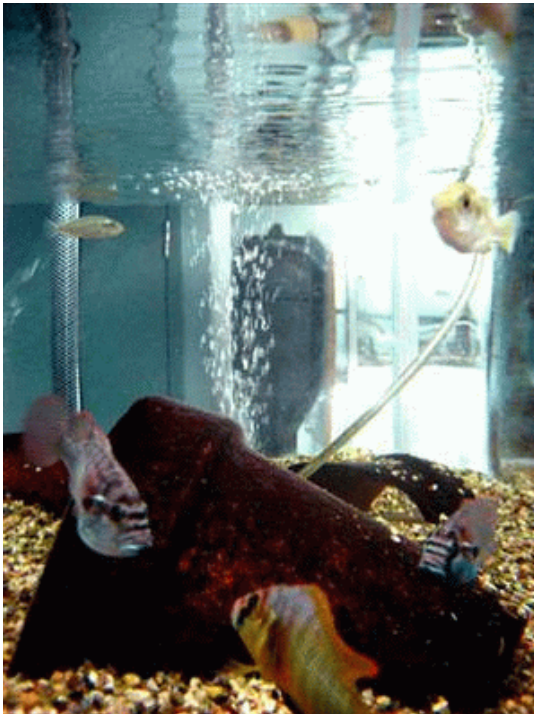
Smarter Than They Look

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.

Recently I was trying to net a particular fish that I wanted to move into a larger tank. Usually as soon as I open the tank lid, that particular fish is right there at the top, begging for food. This time, I had to practically tear the tank apart to catch him. I know many (if not most) of you have had similar experiences. It's as if the fish "knew" what was going to happen. Of course, fish aren't that smart — or are they?

Studies of *Astatotilapia burtoni*, a Lake Tanganyikan cichlid, show them to have the reasoning capacity of a four or five year old child, at least when it comes to figuring out social



A male cichlid eavesdrops on two other fish fighting. New research shows that these fish have the reasoning capacity of a four to five-year-old child when it comes to figuring out which of its peers is "top dog."

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dominance. (Male *Astatotilapia burtoni* fight aggressively to establish territory, to secure control of scarce food resources, and to maintain a location for spawning with females.)

The Stanford University scientists who conducted the studies claim this to be the first demonstration that fish can use logical reasoning to figure out their social pecking order. They found that a sixth fish could infer, or learn indirectly, which were the first through fifth strongest just by observing fights among them in adjacent, transparent tanks, rather than by directly fighting each fish itself, or seeing each fish fight each of the four other fish.

This type of reasoning, called transitive inference, is a developmental milestone for human children, showing up nonverbally as early as ages 4 and 5; it also has been reported in monkeys, rats and birds. It allows thinkers to reason that if A is bigger than B, and B is bigger than C, then A is also bigger than C.

The scientists staged dozens of fights over an 11 day period among five different fish (known to the scientists as A, B, C, D, and E, with A being the strongest and E the weakest) in a circle of transparent, plastic tanks that allowed a "bystander" fish in a center tank to observe each fight as it took place. Fish A fought B, B fought C and so on.

Later on in an open tank, the bystander was able to choose whether to associate with either the A fish or the E fish (remember, the bystander fish never saw Fish A fight Fish E). The bystander was also tested to choose between the B fish and the D fish, which had never faced each other.

Bystander fish typically chose the weakest fish (those that had lost the most fights) as their preferred companion, making the safest choice for their long-term survival and ability to reproduce.

This preference shows, the team writes in the Jan. 25 issue of the journal *Nature*, that the fish used observation and logical reasoning to infer or deduce the relative ranking among the five fighting fish.

So there you have it: scientific proof that at least some fish think like five-year olds, which is somewhat more mature thinking than a few adults I know.



Reference

http://www.livescience.com/animals/070124_fish_brains.html

Reprinted from *Modern Aquarium Series III*, May 2010, Volume XVII Number 3.

Turns Out Fish May Play for Fun!

by Alicia Graef



Reprinted from North Jersey Aquarium Society's **Reporter**, January 2015.

When we think of animals playing, it's easy to quickly imagine dogs and cats with toys, or other furry mammals tumbling around with each other, but a new study from the University of Tennessee has added fish to the list of animals who play just for fun. While there's no way for fish to tell us they're doing something just to have a good time, scientists have come up with a definition of play that works for animals.

Lead author of the study, Gordon Burghardt, a professor in the departments of Psychology, and Ecology and Evolutionary Biology, who has helped identify play in other species, including wasps, reptiles and invertebrates, explains that, "Play is repeated behavior that is incompletely functional in the context or at the age in which it is performed, and is initiated voluntarily when the animal or person is in a relaxed or low-stress setting."

Over the course of two years, Burghardt and his team studied and filmed three male fish, and observed them amusing themselves by repeatedly hitting a bottom-weighted

thermometer. Their behavior was not affected by the presence or absence of food or other fish, and while there are hundreds of species of cichlids, they also noted that the behavior they observed was unique to the species under study.

"The quick righting response seemed the primary stimulus factor that maintained the behavior," said Burghardt. "We have observed octopus doing this with balls, by pulling them underwater and watching them pop back up again. This reactive feature is common in toys used for children and companion animals."

"Play," he says, "is not just random meaningless behavior, but is part of animals' evolutionary history, along with other traits including emotions and intelligence. He adds that it is also "an integral part of life, and may make a life worth living."

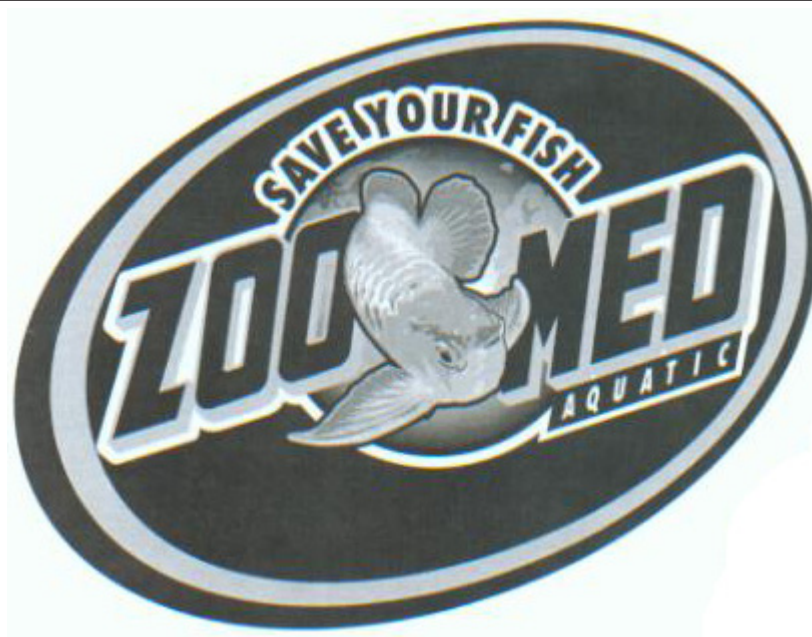
The research, which was published in the journal **Ethology**, is believed to be the first documenting play in cichlids. However, it isn't the only evidence that we've been underestimating the intelligence and complex natures of fish species.



Earlier this summer, in a study that was published in the journal **Animal Cognition**, fish biologist Culum Brown, a professor at Macquarie University in Sydney, Australia, made a compelling case to get us to reconsider the way we see fish, which are often left out of the discussion when it comes to animal welfare or the general treatment of animals. The evidence he compiled showed that fish perception and cognitive abilities often match or exceed other vertebrates, including primates, and that their brains are more similar to our own than was previously believed, or than we want to

believe; they count, use tools, remember things, recognize familiar individuals, and feel pain in a way we can relate to.

Clearly, it's time to rethink the way we are treating fish species, who are kept as pets, held in aquariums, farmed, used in scientific research, caught and thrown back for fun, and killed in massive quantities for food (and fertilizer) around the world. It's time to err on the side of caution when it comes to actions that may cause them harm.



Smart Fish, Dumb People

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.

Some recent news reports are pointing to the conclusion that people are getting dumber, but many animals, including fish, are a lot smarter than we thought they were.

Smart Fish:

United Press International has reported that Australian scientists discovered fish use the threat of punishment to maintain stability in their social order. Australian Research Council scientists at James Cook University said their discovery has implications for the entire animal kingdom, including humans.

Studying small goby fish at Lizard Island on Australia's Great Barrier Reef, Marian Wong and colleagues showed the threat of expulsion from the group acts as a powerful deterrent to keep subordinate fish from challenging those more dominant than they.

In fact, the researchers discovered subordinate fish deliberately diet to remain smaller than their superiors — and so present no threat that might lead to their being cast out and subsequently perishing.

Dumb People:

According to United Press International, a law stating that, in Liverpool, only a clerk in a tropical fish store is allowed to be publicly topless, was voted the third most ridiculous law in England in a poll conducted for UKTV Gold television.

In case you're wondering why this was only the **third** most ridiculous law in England (even if, according a spokesman for the Liverpool City Council, this law does not exist, and is only an urban myth that has gained some notoriety), the English law voted the **most** ridiculous was one making it illegal to die in the Houses of Parliament.

(The law voted to be the **second** most ridiculous is one making it an act of treason to place a postage stamp bearing the image of the ruling British monarch upside down on an envelope.)

Smart Fish:

Reuters reports that the Mangrove Rivulus, *Rivulus marmoratus*, a killifish from mangrove swamps across the Americas, can survive out of water for months at a time.

In laboratory tests, this fish was found to be able to survive for up to 66 days out of water without eating, and with their metabolism functioning (that is, without estivation). When their habitat dries up, they live on the land in logs. No other known fish can be out of water as long as the Mangrove Rivulus and remain active.

Surviving on land is not the only unusual behavior exhibited by the fish. They have both testes and ovaries, and essentially clone themselves by laying their own (already fertilized) eggs.

Dumb People:

Hey, I enjoy my fish as much as the next person, and sometimes I may talk aloud while doing tank maintenance (especially if I accidentally spill water, or can't get a filter to restart!). But, I don't think that any of my fish truly appreciate my subtle humor. However, Professor Richard Wiseman, from the University of Hertfordshire, who conducted a study of 2,000 owners of pets of all kinds, declares that, "almost 60% of us are convinced that their fishy friends have a personality and a sense of humour." "It may be hard to think of fish having personality, but fish owners insist that they do," said Prof. Wiseman.

Based on the ratings given by their owners, the study suggested that 62% of dogs, 57% of fish, 48% of cats, 42% of horses, 38% of birds, and zero per cent of reptiles had a good sense of humor. This study also concluded that "no-one is happier than a keeper of tropical fish." I agree.

Smart Fish:

United Press International reports that Logan Grosenick and his Stanford University colleagues found that male cichlids (*Astatotilapia burtoni*) were able to infer the relative dominance of fish engaged in a series of staged fights between pairs of unfamiliar rivals.

The researchers found the territorial fish show rudiments of logical reasoning, and the study suggests cichlids have the capacity for transitive inference (the ability to deduce unknown relationships based on knowledge of known relationships).



Reprinted from Modern Aquarium Series III, December 2007, Volume XIV Number 10

Smarter Fish

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 supported by the Research Council of Norway concluded that, "Raising fish in tanks that contain hiding places and other obstacles can make the fish both smarter and improve their chances of survival when they are released into the wild."

Researchers placed pebbles, rocks, and plastic plants in tanks, and moved the objects around about once a week during the eight-week study. Fish raised in those tanks made fewer mistakes when trying to escape a maze, and their performance continued to improve, learning to solve the maze much faster than fish reared in standard (i.e., bare and decoration-free) tanks.

The researchers also discovered that the brains of the fish from the enriched tank were different, having more of a gene in a region of the fish's brain associated with learning and memory, indicating increased brain function and growth. Fish raised in standard tanks showed no sign of increased brain development.

I always thought it was harder to net fish in heavily planted and decorated tanks because of the decor, but maybe it was because the fish in those tanks were just smarter!



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¹ http://www.eurekalert.org/pub_releases/2013-07/ps-apc072913.php



Juvenile Atlantic salmon raised in tanks with hiding places and floating artificial plants showed signs of improved brain function and could better navigate mazes than the salmon reared in standard hatchery tanks. The discovery may help fish hatcheries raise a smaller number of fish that can better survive in the wild.

Credit: Anne Gro Salvanes

Reprinted from *Modern Aquarium Series III*, May 2014, Volume XXI Number 3

FISH COGNITION

by Leonard Ramroop



Recently I came across an article¹ from two researchers on the topic of fish cognition, Redouan Bshary from the University of Neuchâtel in Switzerland, and Culum Brown from Macquarie University in New South Wales, Australia. The collaboration was published in **Current Biology** in October 2014. In this article the authors demonstrated that fish do have the capacity for thought and learning.

The authors give us two examples: the guppy, *Poecilia reticulata*, and the African cichlid *Astatotilapia burtoni*. The guppy will swim with members of a group it recognizes—a learned cognitive behavior. It also exhibits spatial learning, i.e. the awareness of the environment inhabited by and the ability of the fish to navigate and recognize it. *Astatotilapia burtoni* changes its coloration for dominance and mating, and has reasoning to recognize the proper species for mating. This social² component of the behavior of these two diverse species has a definite correlation to cognition and reasoning in fish. The authors expand on spatial learning, stating that both species have this ability.

Also noted in this publication was the ability of fish to recognize dangers, and seek out shelter, food sources, and mates³. Fish, like their counterparts on land, do have a navigation system that enables them to find food sources, breeding grounds, and suitable habitats for survival⁴. All these factors reflect that cognition and reasoning do exist in fish. Further research will determine its extent.

As to my own experience of the intelligence of fishes and their learned behavior, I suggest

observing their behavior during feeding. Many fish in home aquaria will sense your physical presence as you approach the tank, and they swarm to the top, anticipating that food will be given to them. This is an example of a simple classical conditioning and the cognitive ability to recognize a stimulus. In evolutionary terms, we are all descended from the first bony fish that crawled out of the ocean millions of years ago. Their simple brains were the precursors of our complex mammalian ones, yet the capacity for cognitive functioning, as related to spacial and social learning is present regardless of nervous system development.

On an historical note, Plantegenet “Planty” Guppy, son of Robert Lechmere Guppy, was a founding member of the Trinidad and Tobago Field Naturalist Club (TTFNC July 1891). Trinidad at that time was a Crown Colony belonging to Great Britain and part of the British West Indies. The father sent samples of a fish he caught on the St. Ann’s River in Trinidad to London to be identified, and the rest is history. The species was initially named after him: ‘*Girardinus guppii*,’ but the name was later changed to *Poecilia reticulata* when it was discovered that the same species had already been described from Venezuela. However, the “guppy” part stuck⁵.

A special thank-you to Daniel A. Garces, a doctoral candidate (psychology) at CUNY Queens College for his input.



¹ Bshary, Brown: **Fish Cognition**

² Ibid

³ Ibid

⁴ Ibid

⁵ <http://www.guardian.co.uk/lifestyle/2016-05-26/birds-bugs-bats>

Astatotilapia burtoni photo from <http://www.african-cichlid.com/Burtoni.htm>

Poecilia reticulata photo from Wikipedia Commons

Fish On The Brain

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.

I recently read (inside a bottle cap of Snapple® brand iced tea) that the attention span of a goldfish is three seconds. That means fish are pretty stupid, doesn't it? Then why is it that they seem to know, when you approach their tank, whether you are trying to net them, or feed them?

Well, there is considerable evidence that fish are not as stupid as we once believed. Science Correspondent Robert Matthews wrote an article in The Telegraph, an on-line British daily newspaper (<http://www.telegraph.co.uk>), on 3/10/2004 titled "Fast-learning fish have memories that put their owners to shame." This article states: "If you thought fish were cold, wet creatures who forget everything in three seconds flat, think again. Scientists have found they are fast learners, carry mental maps around in their heads - and can retain memories for months." Studies by Oxford University researchers concluded that, "despite their tiny brains, fish possess cognitive abilities outstripping those of some small mammals."

An article in Britain's Practical Fiskkeeping magazine titled "Blind cave fish are smarter than dogs" stated that "New research on Blind cave fish has found that they can put even dogs to shame in the intelligence stakes." The article cites the work of Dr. Theresa Burt de Perera, an ethologist (someone who studies animal behavior) at Keble College Oxford. Dr. de Perera studied the behavior of the Mexican Blind cave fish (*Astyanax fasciatus*), which in the absence of working eyes, rely on minute changes in pressure to detect objects in the water. By using their sensitive lateral line system to detect changes in pressure, they can swim around without banging their heads against the glass, rocks, or other fish.

Dr. de Perera also found that these fish did more than avoid bumping into objects in their tank. They apparently build a detailed mental map, memorizing the obstacles in their surroundings within a few hours. Once stored in their brains, the fish use this "mental map" to spot changes in the obstacles around them — a feat beyond the ability

of hamsters. Heck, forget hamsters, if I tried negotiating my fishroom in the dark, I'd be a mass of bruises, no matter how many times I did it.

Laboratory tests on other fish have found that they can store memories for many months, confounding the conclusion some might draw from by Snapple bottle caps that fish forget everything after a few seconds. For example, Dr. Culum Brown at the University of Edinburgh has found that Australian crimson spotted rainbowfish learned to escape from a net in their tank, and remembered how they did it eleven months later (New Scientist, October 6, 2001, p27). Dr. Brown used a trawl net in a tank to simulate a predator. The fish could only escape through the middle, where there was a hole in the net. Their memory of the escape route was almost as good when they were tested eleven months afterwards. It is interesting to note two things. First, the Australian crimson spotted rainbowfish only live for less than two years. Second, for this fish to remember something eleven months later is equivalent to a human recalling a lesson learned 40 years before. (Frankly, I'd have a hard time recalling what I ate for lunch a week ago.)

The Independent, another on-line British newsletter (<http://news.independent.co.uk>), reported in an article titled "Networking in the fish tank: the humble guppy always remembers his friends" (by Dave Higgins, 12/29/2004), that "Far from possessing a three-second memory, as is widely believed, scientists have found that fish form social groups and are able to remember their partners." This article reports on a team from Leeds and Bath universities that have "observed guppies living in complex networks, actively choosing — and recalling — social partners."

Before you start thinking your guppy (*Poecilia reticulata*) is so smart, consider recent research that seems to point to the fact that female guppies select mates that most closely resemble their favorite fruit. In a study reported in the Royal Society ("A possible non-sexual origin of mate preference: are male guppies mimicking fruit?"), a team from the University of Toronto, Canada, led by Helen Rodd, reports on research on why female guppies prefer males with orange spots. They used plastic disks of different colors to test the preferences of wild guppies, both females and males. They found that orange was the favorite color of both sexes. This could be because one of the Guppies' favorite foods is the bright orange fruit of the rare Cabrehash Tree (*Sloanea laurifolia*), which grows in northeastern South America, Trinidad and Tobago. (Is that like selecting as a mate someone who is the "apple of your eye" or who has a "great pear?")



Reprinted from *Modern Aquarium* Series III, April 2005, Volume XII Number 4

Unheard (of) Fishy Conversations

Observed by Jannette Ramirez

Just as the title of this article states, I am about to unleash a regular occurrence in my home. I am a proud owner of several different species of pets. I have two parakeets that always have a lot to say and share with anyone willing to listen to them. I currently have a six year-old red tiger Oscar named Mabel, who is very confident and loves to observe all that goes on outside her tank, which happens to be in my bedroom (!). I also own a three year old female Rottweiler named Isis. She is very sociable, and loves both my feathered and finned companions.

The normal routine in my house is for me to put everyone to bed at night. The parakeets get covered overnight, and *most* of the time, they go to sleep. Next, it's Mabel's turn to go to bed. I wish her a good night, and turn off her tank lights. She then goes to her favorite area at the bottom of the tank, and leaning slightly to one side, she rests until late the next morning (she's not a morning fish!). Finally, turning off my bedroom light, I tell Isis it is our turn to go to sleep. She has her very own orthopedic bed next to mine, and she makes herself comfortable,

then sleeps till our morning walk. This was the norm until a couple of months ago, when I awoke unexpectedly, and found that my children were not in bed!

Isis was sitting very quietly and attentively in front of Mabel's tank, while Mabel was at eye level facing forward staring directly at Isis. They seemed to be in deep conversation together! I quietly observed this behavior, while thinking to myself, "what are you two talking about at this hour?!" To my surprise, the instant I mentally questioned their secret meeting, Mabel looked at me as if I interrupted them, turned abruptly, swooped to the bottom of the tank, and took up her normal night-time sleeping position. As if nothing had happened! Isis calmly turned her

head to look my way and seemed to realize too, that I had caught them "talking" together. Then, like Mabel had, Isis went quietly to her bed, and fell asleep within seconds. I couldn't believe my eyes! I had to wonder how long these *telepathic* conversations had been going on right under my nose, without my noticing!

So, keep your eyes open, and don't be surprised if you discover that *unheard of fishy conversations* are going on in your homes too!



Photos by Adiola Ramirez.



Isis – Not talking!



Mabel – Not a morning fish.

Reprinted from *Modern Aquarium Series III*, May 2008, Volume XV Number 3

Is it Soccer, or Fish Football?

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 Chinese aquarium has been criticized by animal activists for staging a weekly soccer (i.e., "football" outside the U.S.) match to boost visitor numbers – with the match taking place in one of the giant fish tanks.

The Tianjing Aquarium in northern China defended the decision to stage an "underwater World Cup," saying that it was a bid to promote people's interest in the underwater world and encourage visitors to see the huge variety of animal life available.¹

The players in the aquarium were human, and the ball was filled with water to keep it from floating away. While the players were able to execute some spectacular moves, I was far more impressed seeing a trained goldfish playing soccer in a YouTube video.²

While some might say I'm easily amused, the fact is that I find people kicking a ball unamusing, in or out of the water.



YouTube video of trained goldfish



Tianjing Aquarium photo from the online edition of The Daily Mirror

¹ <http://www.mirror.co.uk/sport/football/news/chinese-aquarium-stages-underwater-world-3878761>

² <https://www.youtube.com/watch?v=S7qoQS3EiNE>



WET LEAVES



a Series On Books For The Hobbyist
by **SUSAN PRIEST**

Where to begin? A wonderful book written by an excellent author, it makes you want to share. This book makes me want to share it with you, the loyal readership of **Modern Aquarium**.

The Dragon Behind The Glass was not written for aquarium hobbyists, but it was written for everyone who loves a good fish tale. Even though the author spends 3½ years visiting 15 countries in the hope of observing a “Super Red” arowana in the wild, this is not a book about arowanas. This is a book about people and their obsessions.

A few words about arowanas in general are called for at this point. The Super Red is one of the color variants of the Asian arowanas, all of which are banned from the U.S. (Even though they are produced by the thousands in the fish farms of Asia, and are distributed all over the world, they are on the IUCN red list, and are considered to be endangered in the wild.) There are a few other genera/species of arowana which are allowed. The most commonly encountered of these is the Silver

When you find a

The Dragon Behind the Glass
Emily Voigt
Scribner
Publication date: May 2016

Arowana, *Osteoglossum eicirrhosum*, (aka the water monkey, so called because of its jumping abilities). The **Asian arowana** is the most sought-after and expensive fish in the world. It goes by many different names (don’t most fish?), but is most commonly called the **dragon fish**.

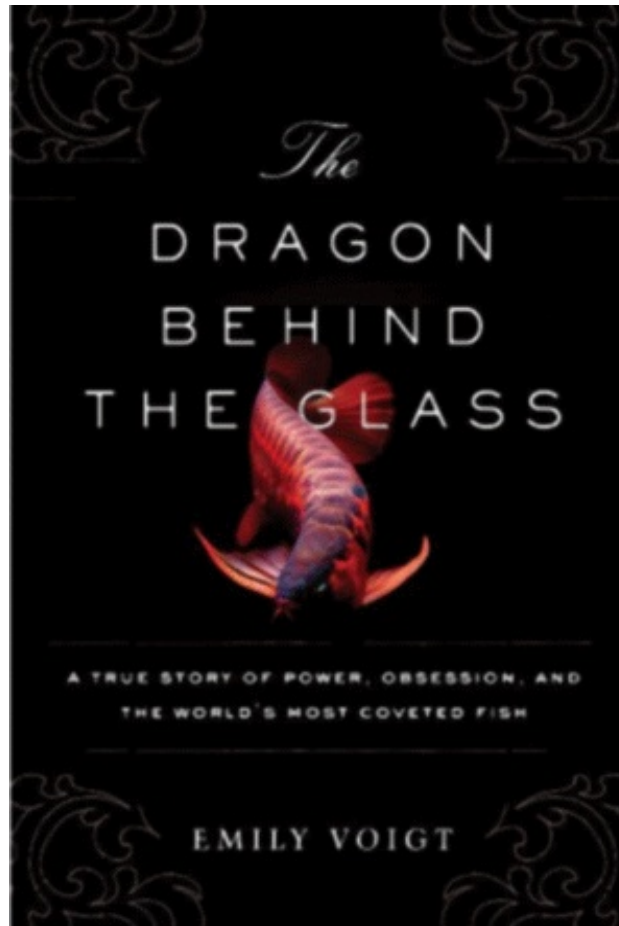
Our author gets her feet wet at Aquarama, a fish show in Singapore, where she is first exposed to some of the eccentrics of the genre. Two in particular are Kenny the Fish, and Heiko Blehar. They introduce her to many others, who lead her in more directions

than she can imagine. Some of them work in museums and universities. Some of them are fish farmers and exporters. Some of them are

poachers and smugglers. Who can she believe? Which ones can she trust? This very talented author takes us with her to Burma, Myanmar, Brazil (and pretty much everywhere in between). She too has become obsessed with finding the Super Red! This is an adventure you won’t soon forget.

Over and over the story keeps going off in tangents. However interesting they might be, and they are, they still haven’t led us and our author to achieve her elusive

goal. During one of her trips to Borneo, she learns of a U.S. angler attempting to catch a snakehead (which the U.S. has also banned). Instead, “he landed a Super Red arowana the size of a snowshoe by using a spoon as bait!”



I wanted to offer you an example before I described the text as anecdotal. Ms. Voigt masterfully blends her personal experiences with a broad spectrum of information. Every page will take you someplace you've never been before.

Even though it is not a history book, there are numerous historical references. Here is one brief example: "The ancient Egyptians embalmed mass quantities of fish which they buried in piscatory cemeteries." Who knew?

The references to conservation laws and issues, both historically as well as in the present day, are far too numerous to review here. However, I will offer one quote for you to ponder. "As far as conservation is concerned, we should protect the environment and not the animals." Also of interest is the fact that raising fish in fish farms removes the economic incentive to protect them in nature.

The only illustration in the book is a sketch of a Silver Arowana from 1851. The occasional maps were less revealing than the words of our author. She will transport you to airports, basement archives, and rain forests, as well as the farthest reaches of your thoughts and imagination. Besides, she lost **her** map in the Amazon river!

There are countless references to the names of people, places, books, periodicals, and much more. On a few occasions I was wishing that there was an index, but after a while I realized that it would be half as long as the book itself.

"Gone is the image of fish as dim-witted pea-brains, driven largely by instinct, and being severely hampered by an infamous 'three-second memory.'" This tidbit was buried deep within the pages of this fascinating book, and since it ties in so well with this issue's theme "Do Fish Think?", I thought I would slip it in, even though there were no evidence or examples offered to support the claim.

As you can see by the list of factoids, arowanas are beyond the abilities of the

average hobbyist. For starters, most homes cannot accommodate a large enough tank.

As I was taking notes I neglected to jot down the page number where Ms. Voigt made a comment about us aquarists. I conducted a futile retroactive search for the quote, but what she said went something like this. She was amazed at our ability to remember the Latin names of the very many fish in our care.

I hope I have led you to an understanding of how much I enjoyed this book, and how highly I recommend it. So, did our travel-weary heroine finally get to see an arowana swimming in the wild? I wanted to leave this question unanswered in an attempt at teasing you into reading the book. But since you have stayed with me this far, I won't keep you in suspense, and will offer you one last quote. "Something shot out of the water like an exploding champagne cork! Maybe three feet long, it glistened silver with a rosy-hued belly."

The Super Red has eluded Ms. Voigt so far, but somehow I think she will be taking a spoon with her on her next trip. The story of the Asian arowana is far from over.



Arowana Factoids

They reach three to four **feet** in length.
They are paternal mouthbrooders.
Eggs are large at 1/2 inch in diameter.
Fry are 3-4 inches long.
They need live food, insects and other fish.
They can breathe air.
They are extreme jumpers.
They are the world's most expensive fish.

A note about Cost

I don't usually comment on the cost of a book. As you have already observed, this book is "hot off the presses," with a publication date of May 2016. The price listed on the

dust jacket is \$26.00. However, I paid \$8.00 and change from an Amazon merchant. Amazon itself is selling it for \$17.00. It pays to shop around! Also, when you are shopping at Amazon, **don't forget to smile!** (If you don't know what that means, speak to Jules Birnbaum.)

Tool Use, Play Behavior and Spousal Cooperation in Hybrid Cichlids.

After some 7 years of close study, it has become apparent that *Amphilophine* cichlid hybrids exhibit several behaviors usually ascribed as too sophisticated for fish. These include rudimentary tool use, overt play behavior and cooperative communication, including acoustic communication. The subjects of this research have all been kept in a row of tanks in my bedroom, as they do not exhibit these behaviors regularly enough for a casual observer to notice, as some are interactive with their owners/captors.



The *Amphilophines* are a large and generally predatory and intelligent tribe of cichlids that make up 25% of all the Central American ichthyofauna. They were forced to become large and opportunistic feeders as the Central American biotopes do not offer the kind of food pantry to be found in the Orinoco and Amazon river basins. As of 2003, 139 species were recognized and there are more still being discovered. They are all considered to be descendants of a single *Heroina* cichlid ancestor that made its way up from South America. They have a fairly recent marine origin, and are only secondarily fresh water fish. Their intelligence and complex behaviors have been the subject of much recent study since **George Barlow** wrote *The Cichlid Fishes* in 2000.

The genera *Amphilophus*, *Archocentrus*, *Hypsophrys*, *Neetroplus*, *Parachromis* and *Petenia* comprise the tribe and their hybrids, who are of prime consideration here, are Flowerhorns, parrot Cichlids, Red Texas Cichlids and Rose Queens. The fish studied herein reside in tanks on the far side bedroom wall, so they can be observed often and at different hours.

Tool Use

During the past three years, on two occasions, I have observed a white Rose Queen male and a Red Texas Cichlid male use a tool for a duration of several weeks. The Rose Queen (who unfortunately perished during Hurricane Sandy) found the black intake tube from a small Aqueon filter in the course of extensive gravel digging. It proceeded to carry the object in its mouth and use it as a battering ram. The culmination of its expertise occurred when it successfully used the tube to hit the air stone over the top of the tank. It kept picking up and jousting with the tube occasionally for three weeks. The same fish was also wont to put its head in the filter box and throw the carbon bag into the tank. The Red Texas Cichlid who now dwells in the same tank also hates airstones. It has figured out how to pull the plastic tubing up and over the side of the tank to get the air stone to the top. This past summer, the same fish, who is a compulsive digger, began to spray mouthfuls of gravel at the air stone. It finally pulled the bottom piece of the filter intake

(Editors note:
George Webber Barlow
Professor of Integrative
Biology, Emeritus, UC
Berkeley spoke at the BAS.
He died July 14, 2007.



George Barlow



off and swam around the cave it had built in the tank in circles, with the pointy end in its mouth. It struck the air stone with the tube repeatedly.

My Female Gold Fader Flowerhorn has for the last year lived in a tank with stream pebble substrate and learned to engage in rock knocking. She found a pebble that was pointy on one end which she could easily manipulate and began using it to knock on the glass whenever she was hungry. The same fish was breeding in the Spring of 2013 and she and the male constructed a large rock-lined cave with 2 entrances. One day she pulled the Eheim heater off the tank wall and put it right next to her nest, where she sleeps. My attempts to reattach it were in vain; she pulled it off and put it back on the substrate over and over. I finally solved the problem by raising the tank temperature from 83° to 87° degrees. Now she leaves the heater alone.

Spousal Communication

As of the year 2000, George Barlow had documented 16 cases of vocalizations made by cichlids. Acoustic communications in combination with body posturing and display give *Amphilophine* cichlids a potentially very rich vocabulary. There have been 23 soft, low frequency vocalizations thus far documented, ranging from grunts to purrs to knocks and

drumming. The above mentioned female Flowerhorn was working in concert with her mate on the nest in March 2013. The nest they were building had rocks in two roughly parallel rows covered with driftwood and a back and front entrance. There were a lot of pebbles in the back which she was pushing through the front. After a while, she and the male took a break and got together face to face. After that, the female continued her work, but the larger male now picked up the pebbles and she pushed through and threw them away from the front opening, leaving it quite larger in about an hour.

There was a medium sized conch shell in their tank blocking egress from the front nest entrance. The male braced himself behind it and tried to push it out of the way to no avail. The female tried unsuccessfully as well and a few moments later, both retreated to the other side of the tank and stayed face to face for several minutes. Then they returned to the area behind the shell, almost perfectly lined up in

parallel, both with their mouth against the shell. They then both pushed forward simultaneously, and moved the shell several inches out of their way. It is not stretching the imagination to conclude they had conversations, likely including acoustic communication, to make a joint effort for both to do what one could not.

I ascribe no particular importance to the *Amphilophine* hybrids, other than the fact that *Amphilophines* are intelligent. The fact that they were hybrids more than likely reflects my interest in them in general. Species in the Midas Cichlid Complex have been reputed to engage in other complex behaviors. 

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George W. Barlow, *The Cichlid Fishes - Nature's Grand Experiment in Evolution*, Perseus Publishing: Cambridge, Massachusetts. XVI +335p.



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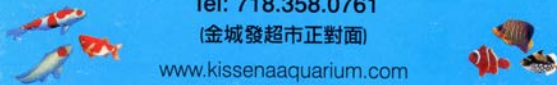
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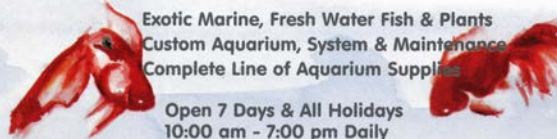


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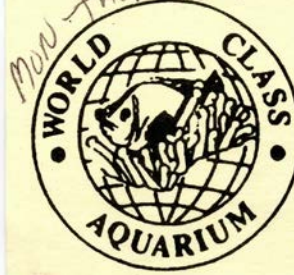


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Drawing Conclusions?

by Dan Radebaugh

So, have the preceding articles helped us reach any new conclusions, or are we each still buying whatever was purported to be scientific fact back when we were growing up?

We can see that these days there's a lot more research going on than there once was, and perhaps with a more open minded approach. Interestingly, Charles Darwin did a lot of work on animal intelligence, but at about that time the behaviorists pretty much took over the world of psychology, and Darwin's work on the subject is only recently being revisited.

One of the sins one can fall into when talking about animal behavior is anthropomorphism, roughly defined as attributing human traits, emotions, intentions, etc. to non-human entities. All serious studies need to be designed to account for our tendency to attribute our own world-view, if you will, to all other creatures. So far so good. On the other hand, we seem to find little fault with what I think of as "cybermorphism," or the attribution of some kind of robotic programming of unknown origin to other-than-human beings. We have historically referred to this alleged programming as "instinct," which we are led to believe is somehow hard-wired into all beings other than ourselves, and accounts for how they are able to get along in this world without real intelligence, which is of course reserved (How? Why? By whom?) only for us.

Of course none of this is as simple as we would like for it to be. There's a series on CUNY TV called **Science Goes to the Movies**, which is available for download, should you be so inclined. One of the episodes includes a discussion of **The Imitation Game**, a movie about the WWII contribution of Alan Turing in breaking Germany's Enigma code, as well as some discussion of Turing's contributions to computer science, including concepts of AI (artificial intelligence). One of the hosts, a neuropsychologist, asserted that there is in fact no extant test for consciousness. So there's really no way to know for sure that even another human being is conscious (let alone say, a fish). They might act as though they are, but we can't truly know.

It is beyond the scope of humanity's current collective knowledge, much less this issue of **Modern Aquarium**, to resolve all questions about fish consciousness, animal behavior in general, or our own behavior, for that matter. But hey, you want to know, you have to ask!

I have mentioned in a few articles in past issues of **Modern Aquarium** examples of specific behaviors that have impressed me, such as the male *Paratheraps synspilus* who figured out how to defeat the divider we placed to separate him from his lady (to keep her

safe and alive), but was careful not to do so while we were in the room and could see how he accomplished it. We had to rig some mirrors so that he couldn't see us watching to discover his technique. Fascinating stuff!

If you are interested in doing some research yourself, here is some advice from Stéphan Reeb, the author of **Fish Behavior In the Aquarium and in the Wild**: "Animal behavior is an object of fascination, amusement, and wonder. To watch it, one need not face the

exacting conditions of fieldwork. From a comfortable chair set up in a dark basement, in front of a well-lit aquarium, one can observe the reactions of colorful, resourceful, and not-so-dumb fishes. Smaller than most mammals, less bothered by captivity than birds, esthetically more appealing than insects, fishes represent an ideal subject for behavioral observation. And behavioral experiments can be conducted by anyone with a minimum amount of time and curiosity, a few transparent partitions, crude models, automatic feeders, and maybe a video camera. Many ideas can be tested in a simple manner, with respect for animal welfare. I encourage everyone interested in fishes to try it. At the very least, I trust that the experiments reported here will ensure that readers will never look at a fish—no matter how placid it appears to be—in quite the same way again."





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

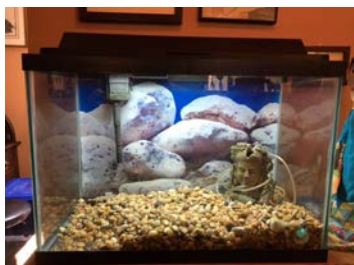


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The tank is in very good used condition. You get this PLUS \$100 worth of SUPPLIES: additional bubbling filter, a pack of carbon filters, water-testing kit, heater, thermometer, fish food and supplies (Prime, Salt, rocks, and other supplies to make your tank optimal for freshwater fish). The tank is perfect for tropical fish as well. (More supplies than shown in images).



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Contact ss@stephaniesellars.com or 917-664-6106

FOR SALE: 45 gal Tall tank w/black stand, hood, light.
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20 gal tank w/hood, light, filter

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GCAS Happenings

September

No Bowl Show Last Month -- Silent Auction

UNOFFICIAL 2016 BOWL SHOW TOTALS:

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

A SPECIAL WELCOME TO NEW GCAS MEMBER STEPHEN LaROSA!

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

GREATER CITY AQUARIUM SOCIETY

Next Meeting: October 5, 2016

Speaker: Mark Duffill (UK)

Topic: Loaches

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

Queens Botanical Garden

43-50 Main Street - Flushing, NY

Contact: Dan Radebaugh (347) 866-1107

Email: gcas@earthlink.net

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

BIG APPLE GUPPY CLUB

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

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

Contact: Donald Curtin (718) 631-0538

BROOKLYN AQUARIUM SOCIETY

Next Meeting: September 9, 2016

Speaker: Joe Graffagnino

Topic: Joe's New Fish-Room

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

NY Aquarium - Education Hall, Brooklyn, NY

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

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

LONG ISLAND AQUARIUM SOCIETY

Next Meeting: September 16, 2016

Speaker: TBA

Topic: TBA

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

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

Email: Margaret Peterson - president@liasonline.org

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

EAST COAST GUPPY ASSOCIATION

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

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

Contact: Gene Baudier (631) 345-6399

NASSAU COUNTY AQUARIUM SOCIETY

Next Meeting: September 13, 2016

Speaker: TBA

Topic: TBA

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

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

Contact: Mike Foran (516) 798-6766

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

NORTH JERSEY AQUARIUM SOCIETY

Next Meeting: September 15, 2016

Speaker: Sandy Moore, President of Segrest Farms

Topic: Farming and Legislation

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

Contact: NJAS Hotline at (732) 332-1392

Email: tcoletti@obius.jnj.com

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

NORWALK AQUARIUM SOCIETY

Next Meeting: September 15, 2016

Speaker: Ted Judy

Topic: African Tetras

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/>

Smarter Than the Average Fish?

A series by "The Undergravel Reporter"

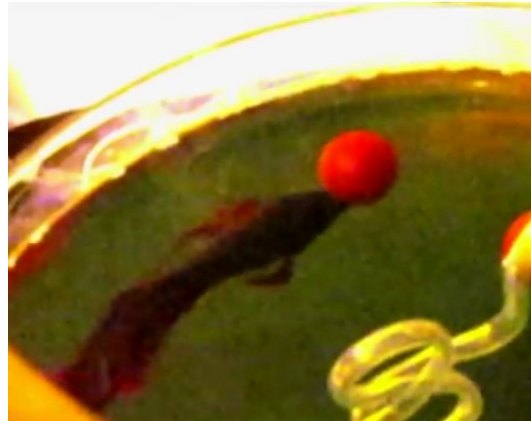
In spite of popular demand to the contrary, this humor and information column continues. As usual, it does NOT necessarily represent the opinions of the Editor, or of the Greater City Aquarium Society.

Whether fish act solely or mostly on instinct or have enough "intelligence" to learn and retain new information is an interesting question. While not directly answering this question, I will direct you to certain YouTube videos, and you can decide for yourself.



Parrot fish playing

https://www.youtube.com/watch?v=nP11Gm_WrDo



Betta Fish Plays Soccer 2

<https://www.youtube.com/watch?v=KxL4lIEstSc>



Trained fish playing soccer

<https://www.youtube.com/watch?v=15Xi-IUKj7A>



Dog & fish kiss & swim together

<https://www.youtube.com/watch?v=jaUayYNFKpM>



Trained Fish Does Amazing Tricks

<https://www.youtube.com/watch?v=b3JFmrlgWAK>

I leave it to you to decide whether these are examples of fish intelligence, or simply the product of very bored, but highly imaginative fishkeepers.





Fin Fun



Go for the Gold

The athletes and teams representing the United States did well in the 2016 Summer Olympics in Brazil. Let's see how well you do in matching the scientific to the common names of some of the species of fish endemic to that country.

Scientific name	Common name ¹
<i>Apistogramma pertensis</i>	Blackline tetra
<i>Campellolebias brucei</i>	Opal pearlfish
<i>Corydoras acrensis</i>	Swordfin killifish
<i>Hyphessobrycon griemi</i>	Marbled pearlfish
<i>Hyphessobrycon scholzei</i>	Goldspotted tetra
<i>Leptolebias marmoratus</i>	Featherfin pearlfish
<i>Leptolebias opalescens</i>	Barredtail pearlfish
<i>Nematolebias whitei</i>	Acre corydoras
<i>Notholebias minimus</i>	Rio pearlfish
<i>Simpsonichthys constanciae</i>	Amazon dwarf cichlid

¹Source: <http://fish.mongabay.com/data/Brazil.htm>

Solution to our last puzzle **Silent Auction**

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LAPNTS	PLANTS

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