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2/18/94

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# LIVEBEARERS

BULLETIN OF THE AMERICAN LIVEBEARER ASSOCIATION



# LIVEBEARERS

Bulletin of the AMERICAN LIVEBEARER ASSOCIATION, INC.

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# Guppy Coloration

by Dr. Eugene Larr

(Reprinted from the October, 1975, issue of GUPPY MAGAZINE, the following was recorded at the February, 1974, meeting of the San Francisco Guppy Association and transcribed by Ken Boltz of the Southern California Guppy Association. It originally appeared in the GUPPY CARETAKER of June, 1975, a publication of the SGA. Apparently the first remarks were altered. It appears that Dr. Larr was speaking about the experience of acquiring a new strain of guppies.)

...you raise that particular fish or its fry, you notice that the color either changes or not. This is especially true in case of the yellow. You will find some of the half-black yellow guppies, an orange as it seems, from which the tails (some of them) look almost better yellow. Then as you raise them yourself in your tank, you know that they become paler and paler and paler until finally it is yellow occasionally; but, it is now a yellowish-white. So the question looks like "are you missing something in the water?"

This prompted a lot of experimentation you will remember one time I mentioned, while speaking up here, that Vitamin A violet foot added to the water seems to help a guppy produce color.

We carried this to further extremes with some beautiful work which was done by a friend of mine at the University of California. Using radioactive phosphorus as a tracer, he started a course with some of the vitamin compounds where we could put radioactive tracer in the molecule itself, put the new vitamin in the water, and after several days take the fish out and study them radioactively and see if they had absorbed that vitamin. We were surprised they had not. It immediately prompted the question, "Why didn't they?"

Well, the first assumption here is that ordinary guppies do not drink water - even though they live in water - they don't drink it. It's true they get water when they eat their food, but this is a very small amount of water because they have in their throat a little section that will grab a bit of food and squish the water away from it before they swallow. The reason is obvious. Because of the water balance problem in a guppy - and you know what that's called after you get a guppy that's all puffed up with scales sticking out. He cannot drink that much water simply because he cannot urinate that much water back out. So he does not take it in. This means, then, any molecule that is too large to diffuse through the cell wall of a guppy cannot enter the guppy unless he swallows it.

We went one step further. If you treat a guppy with a mild solution of phosphoric acid, it will destroy the mucous membrane all over the fish. It is a very difficult and very delicate

operation because if you get it on its gills you will kill him immediately. But, if you simply stripped him of his mucous membrane, we noticed, again using the radioactive tracer, that he could begin to absorb a small percent of the material we put in the water.

But obviously the barriers are not only the cell wall but the mucous membrane on the guppy itself. This is where we get, and I'm sure all of you are aware, all kinds of diseases. If a guppy injures himself, if he scrapes that mucous membrane off, then the underlying net of cells are wide open to infection or are wide open to the absorbing of something you want the guppy to absorb.

Well, so we then started after this problem of what makes a guppy color. We immediately started adding all kinds of things to the water - ordinary things - not chemical coloring agents, not dyes, not things like paprika, not things like beet juice, not things like actual dyes - but those things that are required in the various molecules that give a guppy color. One of the most interesting to play with is, of course, melanin; and one of the very tricky things is the formation of melanin in manganese. This gives us something to play with. What could we feed a washed out half-black guppy that would make his melanin very black so he would then be the dark half-black that we normally see or that we would like to normally see?

Well, we found all kinds of variations and results in those fish that did not show an increase in the intensity of black color due to the presence of manganese. We started taking sections to see how thick the mucous membrane layer was and, more enough, that was the key. Those guppies that have this mucous layer absorbed these molecules were readily than those that have thick ones. It's undoubtedly a genetic trait - the thickness of the mucous membrane. But it is also a trait that is due to environment.

One of the things that Dr. Hittler found out very quickly was that a guppy who was raised in water that is changed half every day from tap water doubles the size of his mucous layer because of the chlorine in the water. He doubles it to protect himself. Because when water is changed half each day with distilled water totally free of everything, the mucous membrane layer stays the same thickness.

Now this merely brought out another interesting point. What happens when we replace water in a guppy tank with water directly from the tap? We know, of course, you'll be getting all kinds of crazy things but among them you're getting chlorine. So this is going to affect the guppy in some way. It's going to, first of all, apparently increase the thickness of this layer and thereby make him more resistant to many, many things. This is probably one of the reasons why many guppies raised this way have very few diseases. But it also plugs up the door through which we want to feed this guppy something. So then we started thinking - okay, if the organic metallic compounds are too big for the guppy to take in

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through his system, and he is not going to drink enough water to make it worthwhile, let us go to simple metallic compounds whose molecules are small. We got some very good results.

I have a little list here for those of you who would like to try it. It's a very interesting little exercise but, here again, we found variations. Some variations colored closely - copper variations, maybe a similar strain, did not. We started to investigate what was the difference. Believe it or not - environment is the change that has to be looked at carefully.

In those tanks where plants are growing, where the water is changed a certain amount, the coloring enhancement is the greatest. Why? Again using radioactive tracers, we found the obvious solution. If we really stop to think about it, I think one of us would come up with it. In the old-fashioned balanced aquarium, remember you had the whole bit. Algae, in that kind of a system, are all of the microorganisms - amoeba, protozoans, rotifers and so forth. Protozoans can take these metallic elements out of the water very fast. If you know how a protozoan works. He's a silver shaped animal. He has an opening which is like a mouth and he has what is called a vacuole. He simply sucks water into this vacuole and closes it off, and if something is alive in there he eats that but he will also absorb all of the elements that are in that drop of water. So, he absorbs them and grows who eats him? The guppy! So we deliberately feed the protozoans this material in a separate aquarium and feed them to guppies in distilled water. They colored beautifully. Where we just simply raised the guppy ourselves in distilled water with ordinary foods, they were much paler. So you see, we have a real complex cycle going here.

While I wouldn't like to have to admit that to get the best out of a guppy coloration we're going to have to have super balanced aquariums with plants and algae and everything else, this old thing of what the guppy is eating between the times that you are feeding him - namely the microorganisms that are living in his environment - is extremely important.

This material was advised at literally by hot and zinc, because some of these things are poisonous. I'm sure you will appreciate the following:

2 grams of manganese sulfate

2 grams of cobalt sulfate

1.5 grams of potassium bicarbonate

1.1 grams of copper sulfate

Distillate in a quart of water; three drops of this liquid is placed in ten gallons every two weeks and so forth. If you have plants in the tank and therefore some microorganisms extending around, three drops in ten gallons every two days. Now when you change water - let's assume for a moment you do not have plants - when you change water, keep track of it, and to substitute this kind of a balance you

\* LIVERMORING author's note: Paramecium is not silver-shaped. Perhaps the speaker said "slipper-shaped."

will have to have how much you take out. I want to warn you about this. None is one of those situations that some is good and you might think lots is better - NO WAY. Six drops in ten gallons can be fatal, and can be fatal quickly. Very likely the biggest problem is the potassium bicarbonate. It's a very toxic substance, unfortunately. It is a source of potassium and chromium that the guppy can readily use to make all the rest of the colors that he plays with. So as you take, let's say five gallons out of a tank, don't add half of the dosage back unless you're going to do this thing only every two weeks. You're going to have to arrive at a balance and you'll have to do it by experimentation. Incidentally, greens colored the fastest. It was amazing how intense they got. This simply is that you are now giving the guppy some of those metals that he might not be getting in his food. This is because a lot of our fish foods will flush all of these metals but - what does are they? This is a problem. Salts are easy to absorb. They can handle it fine. As I say, potassium bicarbonate is very easily absorbed and is deadly poison to a fish. It will make you all antipalated if you get it on you. I would not suggest you add it to your coffee. I don't know what that will do to you. You know that copper sulfate is poison to guppies and you will notice that that is the least amount of material you're adding.

Unfortunately, if you go to buy these things, they come at the supply house, you end up with bottles this big of which you'll use maybe as much as you can get on the tip of a small knife. So, if you're interested in trying this, I would suggest you buy four bottles of stuff you're not going to use in your lifetime. So judge accordingly. You also keep in mind that it is the zinc between feet, those microorganisms, that are extremely important to anything that you want to get inside of a guppy.

We tried some experiments that are not quite complete. We tried some experiments, however, in which this material was added to the salt water used in raising baby brine shrimp. The baby brine shrimp are raised in a large container that is aerated and they are actively eating - baby brine shrimp, you know, live for several days on their little eye sacs. Once that is gone, they start eating and they eat antipalated. Your books will tell you to feed them once a week and this kind of thing. Great! Well, they will even grow. But, they will also get rid of almost all of the metallic minerals that you need to have inside them.

I don't know any way we should it other than simply adding this to the water and trying to cut down on the percent of chlorine in the water that you are adding to your tanks, because the chlorine added to the tanks kills the microorganisms. In one way, of course, that's good because this gives you more control over your fishes' health. I mean, really, if you stop and think - if you change water in a guppy's tank quite often with water that has chlorine in it, you are killing off microorganisms and you are almost starving that

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guppy in a sterile condition. The chlorine that is there is acting as a killer for anything else in the water and of course the guppy itself if it is strong enough. So, if you want to do this and do this as an experiment, I would suggest you only use aged water or boiled water to get rid of the chlorine.

Your ordinary water has a lot of these things. For instance, we did not add calcium here because I doubt if there is a drop of water in California that is not full of calcium. We didn't add magnesium because again there is probably not a drop of water in California that is not full of magnesium. The same goes for sodium, potassium, as well as other kinds of things. We did enhance potassium with potassium bitartrate because potassium bitartrate is a nice molecule for a fish to handle. But exactly how these things are used by a fish is way too technical to go into. But, I'm sure you can imagine if you were asking a particular molecule that is animal friendly (Ken's notes tape garbled these last two words) which is one of the blue colors - he has to have this chromium in that molecule. Well, he can get it there once it is inside the guppy and that's how you have to do it.

I'm very curious - most of the people I've been talking to about the animal blocks that came out about a year ago got the same kind of results as we were getting when we were adding African violet food. Some people had good results. Some people decided they could tell no difference at all. I think - here we have this problem of how thick the mucous membrane is on the guppy. So, remember, anything you add to the tank that you want the guppy to pick up, you're going to almost have to get it down his throat somehow because he is well protected from anything coming to through his skin. His mucous membrane stops at the cell walls of the epithelial layer.

So the easiest way, of course, is to put him in a tank where there is some algae. Put him in a tank where there are some microorganisms so that they can gobble these things up so that he can gobble up the microorganisms. I'm quite sure, from the results we got from outdoor tanks, that this is exactly what's going on. There are enough microorganisms in the tank outside, tanks exposed to all kinds of stuff - dirt blowing in, droppings from who knows what flying over, so they are getting all of these peculiar minerals. Microorganisms are eating them, guppies are eating the microorganisms, i.e. you have a bright-colored guppy because he was grown outside.

can take separate tanks and simply give them an eyedropper full of. Let us say, scraped-up parameciums every day. But if you have as many tanks as Dale (Dale Hartney) has, I don't imagine Dale running around with an eyedropper feeding. I don't know how many tanks now, with scraped-up parameciums. But, it is something to consider.

Here again, you have one of these same things, of course all of these colors are genetically contributed. The genes say I'm going to make this fish blue; but, if the building blocks to make the blue pigmentation are not there, even though the genes say I'm going to make it blue, he cannot possibly make it blue. It's just simply that. The genes say I will do it if you will give me the building blocks to do it with. If they are not there, he can't build them at all.

It would be very interesting to see some of our pastels that were treated with this material to see where they would go. Now many of our pastels, the soft, beautiful pale colors (hence the name pastel), how many of these are due to environmental conditions having a lack of building blocks to make pigment and how many of them are actually dictated by genetics. It would be interesting, and on that subject we have absolutely no guesses at all. But I know on those that we tested, which were red, blue, green and half-black, the difference is startling. As always, you always do these kinds of tests by splitting up groups of brothers so that you know who's who, so you're dealing with the same kind of things. The results all the way down the line were very, very fine.

If you want to play this direction, if you wonder whether or not your fish is getting the right vitamins, check your foods. It's not to be in the food or he will not get it. The vitamin molecule is too big unless he swallows it. The minerals, especially these particular ones, have very small molecules and he can get those but he will get them better if he eats them via another animal. So give it a try and, if you have washed out guppies, I think you will be very surprised at the results. Thank you very much.

#### LIVEBEARERS BACK ISSUES

Back issues are called third class, postage, \$1.25 each.

Make payment to: American Livebearer Association.

Send order to: Joanne Norton  
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Anes, Iowa 50006

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mouthful of it. The microorganisms, of course, break the algaes down. They start breaking it into something they can use. Now the guppy can use those fragments if he eats enough of them of course. But in those matters that we're talking about, we're talking about the guppy molecule itself very, very fractional parts per million. I mean we're not talking like he's got to have a thousandth of this; we're talking a millionth of this in what makes the difference. So, as I say, don't exceed this or you will be in trouble. You can kill them very fast.

I hope, as we go along, some of you will try different experiments with the water conditions that you're got. For instance, one of the gentlemen in Colorado that was doing some work along this same line - I asked him to try some of these to see if he could get duplicate results under an entirely different set of water conditions. He did, he found that he got the best results, now I'm not sure if we're dealing here with a psychological thing or not, but he felt he got the best results if, in addition to these, he had a rusty nail in the aquarium. Well, certainly iron is required in the guppy's diet, but, here again, water is coming into your aquarium through iron pipes like mad and, if you run a rusty looking one out. Well, I suspect, since he is rather an emotional type, he felt he had to have a rusty nail in there to make sure there was some rusty iron in the aquarium. So whether or not that will add to your guppy's color I don't know. I personally doubt it, because I think there is enough iron already there. But certainly there are other ones and especially chromium. It's an amazing material and is absolutely necessary.

So I'll leave a copy of this with someone here so you can try it if you want to. I will assure you that your black guppies will never look bluish, your blues or greens will never look bluish or greener.

You can go the other route. Take the guppy that has been growing in your water that you use all the time. Put him in a small aquarium where you're changing the water, a small bowl - let's say two gallons - where you're changing the water every day with aerated distilled water and, if you will watch carefully under the same lighting conditions, as time goes by will get paler and paler, and paler because you are leaching him out just as if you were leaching out a wash rag. Then, after you get him down to where he is so pale and you're not even sure what he was when you started,

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## BROOD RECORDS

Include live fry only, a single brood, from a sterile isolated female. Send counts to: Joanne Norton, 2305 Emerald Ave., Anes, Iowa 50010.

*Brachygnathus rhombostomus*: 66 (Dick Haeflner)  
guppy: 193 (Joseph S. Gault)  
*Poecilia reticulata*: 94 (Joanne Norton)  
*Poecilia reticulata*: 207 (Joanne Norton)  
*Poecilia vittata*: 223 (C. L. Michaels)  
*Poecilia arcti*: 193 (Joanne Norton)  
*Poecilia nigrofasciata*: 106 (C. L. Michaels)  
*Poecilia waltiana*: 153 (Joanne Norton)  
salfin molly: 192 (C. L. Michaels)  
*Poecilia latipinna*: 197 (C. L. Michaels)  
*Poecilia latipinna*: 26 (Joanne Norton)  
*Poecilia reticulata*: 97 (C. L. Michaels)  
*Poecilia formosa*: 32 (C. L. Michaels)  
albino salfin lyretail molly: 101 (C. L. Michaels)  
albino salfin molly: 130 (C. L. Michaels)  
black lyretail molly: 168 (C. L. Michaels)  
marble molly: 172 (C. L. Michaels)  
*Poecilia gambusia*: 77 (C. L. Michaels)  
black opal molly: 167 (Ken Kihlander)  
*Poecilia ornata*: 53 (C. L. Michaels)  
*Poecilia vivipara*: 250 (C. L. Michaels)  
*Microgasteria* *truncata*: 19 (Michael J. Wilson)  
swordtail: 200 (Steve Saunders)  
sunset varietus: 231 (C. L. Michaels)  
*Pimephales alberti*: 40 (Joanne Norton)  
*Pimephales montezuma costae*: 26 (Dan Froom)  
*Pimephales variatus pichincha*: 29 (Joanne Norton)  
*Pterapogon kauderni*: 17, over a 4-day period (Michael J. Wilson)  
*Teleostoma holbrooki*: 193 (Edward V. Fiech)  
*Teleostoma affinis holbrooki*: 90 (C. L. Michaels)  
*Gambusia pinnatifidus*: 31 (Dan Froom)  
*Gambusia georgii*: 30 (Joanne Norton)  
*Dermogaster* (halfbeak): 94 (C. L. Michaels)  
*Eleotrisoma* (Dulacost or Celebes halfbeak): 66 (C. L. Michaels)  
*Neoheterandria subnubilus*: 20 (Rosemary Lewis)  
*Xenotoca elongata*: 89 (C. L. Michaels)  
*Xenotoca variata*: 27 (Ted Fobed)  
*Xenotoca variata*: 27 (Joe Zuhl)  
*Anes splendens*: 25 (Dick Yarlatt)  
*Alfaro cultratus*: 74 (Ken Kihlander)  
*Alfaro bohreri*: 70 (C. L. Michaels)  
*Cimarronia falcatum*: 37 (John Huber)  
*Cimarronia metallicus*: 68 (C. L. Michaels)  
*Poecilia reticulata*: 10 (Joanne Norton)  
*Poecilia reticulata*: 15 (Brian A. Hatley)  
*Parachanna lateralis*: 10 James K. Langhammer)  
*Allocheilichthys* *torrei*: 6 (James K. Langhammer)  
*Quilichthys atriceps*: 34 (C. L. Michaels)  
*Phallostethus granatus*: 51 (C. L. Michaels)  
*Phallostethus caudimaculatus reticulatus*: 16 (Joanne Norton)

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## Ameca splendens

of the Family Cichlidae from Mexico

by Dick Yantall

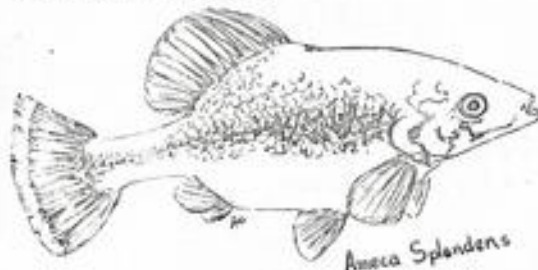
(Reprinted, with revision by the author, from FISH TALK, Greater Iowa Aquarium Association, January, 1979.)

*Ameca splendens*, that's the name of the newest livebearer, and, man, what a fish! It's about two to three inches long and it looks like a miniature brook trout. The male has a yellow fringe on the very end of his tail. I was able to get 10 from a fry and I must admit I know nothing about them. At this writing, I still know very little. They are a fast-moving fish and the female has a lot of bright spots on her body that make the silver background just seem to glisten.

The first brood I had was only 11 fry, and I thought that from the size of the fry that she must have had them very tightly packed in her body because they seem about three-quarters of an inch long at birth. You can imagine my surprise when I saw the size of those broods. I asked my friend, Harry Crier, what I should feed the new fry and he answered, "baby alligators." When I saw the size of the fry I knew why he said that! You can imagine my amazement when the second female had 25 babies! The size of the fry suggested that the female should have been the size of a large swordtail to have that many babies.

I might mention at this time that the first female I took out right away and put her back with the males the next morning. She is no longer with us, but the second one I put in a tank by herself and she and the fry are doing well. They do not carry spore over like mollies, swordtails and guppies.

The Mexican government restricts export of them so they are a little hard to come by, but nevertheless a very beautiful fish—they should make a good show fish.



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I might like to combine some of my goodwife and *Jaliscochromis*. He said that they were both about the same in terms of *Amecichromis*, etc. He said the males would hang around in the bottom ten percent of the tank and the goodwife could have the rest of the tank. I, of course, eliminated *Amecichromis* since they spend a large portion of their life pretending they want to grow up to be piranhas. I, *Amecichromis* have a track record of being very nasty and are most willing to take on larger and often thought of as tough customers.

My first effort was to combine *Ameca splendens* with *Jaliscochromis* (which is a 70 gallon tank and it worked out just as Paul Lohelle had said. The fish got along with each other well and suddenly I was one twenty gallon ahead and my 70 gallon tank looked better than I ever thought it could and was much more interesting to watch the actions and interactions.

I was surprised to see the big fish get along so well with each other. I was very pleased to see baby *A. splendens* show up and hang around with the *Jalisco*. I hope to see what happens when the *Jalisco* spawn. Since the pair had spawned about a dozen times, I assume sooner or later they will.

I later put what I assume to be a pair of *Jaliscochromis* (which is a 40 gallon tank with *Amecichromis* *Amecichromis*, same as with *A. splendens* and *J. spallieri*).

It appears, in my way of thinking, that this combination has no adverse effects on the fish and, in fact, benefits them. The fish are in a larger tank, are more active and alert, and the fish get the added benefit of getting more attention from us and are treated better.

For years we have seen the advantages of a tank of different species of cichlids being housed in a large tank. The fish not only add variety and make the tank more pleasing to look at, the reproduction is not at all adversely affected. I realize fish from Lake Tanganyika and Mexico don't normally hang around together but they seem to do well in my tank. For years there seemed to be some fish that normally sized, but, with the exception of Angila, *Amecichromis* seem's along with non-cichlids.

I will greet you that mixing *Cichlasoma* *Amecichromis* and *Amecichromis* will work out but perhaps some other odd-ball combinations will work out for you.

From James W. Atlas Here is the very brief sketch of the great Cuban waterbird, Felipe Joy, taken from David Starr Jordan's two-volume massive opus "Guide to the Study of Fishes." Joy was an excellent ichthyologist, but he also was an ornithologist.

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(Excerpt, on *Ameca splendens*, from a letter by James W. Lachlamer, reprinted from FISH TALK, Columbus, Ohio, March, 1976.)

But now on to the "bad guy" department, that is, of course, your verisimilitude Journalist Dan French, who in the December FISH FEARING apparently is attempting to discredit himself by his pen name, "SIRY Inn." Dan really isn't a wholly rotten sort, and I've spent some enjoyable evenings trying to talk some sense to him. It was bad enough when his poor taste (apparently located in conjunction with those cheeks most distant to his cerebral ganglia) caused him to erroneously assess his own stock of *Alfaro cichlidae* as more colorful than my own. Such hereby I could normally ignore considering the course! However, when he writes one of my favorite fish - the magnificent butterfly goodwife, *Ameca splendens* - and attributes erroneous observations to myself concerning their "ferocity," then some rebuttal must be forthcoming.

I have never to anyone said that the butterfly goodwife is ferocious--nor have I ever housed them at home with swordtails! It would seem that Dan in his deluge may be becoming characterized of the blither syndrome so characteristic of woman folk-- the ability to soak everything up and get it all backwards!

The butterfly goodwife do not exhibit any belligerence to any fishes that I have ever seen them housed with. I do not even bother to isolate gravid females from the stock tank since adults which are well fed do not molest their own juveniles. All goodwife have formidable dentition, so do not expect starving goodwife of any species to manifest good behavior. But, please, do not deprive yourself of the great pleasure of owning these fish because of a statement I did not make!! In conclusion, I'd like only to say that the most common cause of death in goodwife, and I'm sure the so-called "plague" to which Dan attributes his goodwife losses, is old water. Goodwife simply cannot long tolerate water of lowered pH with elevated levels of nitrogenous wastes and bacterial pollution.

## Mix and Match

by Charley Grimes

(Reprinted from TROPICAL TOPICS, Indianapolis Aquarium Society, November, 1970.)

A couple of months ago, I was fortunate enough to be able to spend a little time with Mr. Paul Lohelle. Lohelle is justly famous regarding fish both professionally and in the hobby.

Anyway, as an aside after seeing my fish room, Paul suggested

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miscellaneous, miscellaneous, etc. I think it is appropriate that the readers of *Amecichromis* become acquainted with him.

The fish fauna of Cuba has been the lifelong study of Dr. Felipe Joy y Aley (1890-1971), a pupil of Cooper, for a half century or more the honored professor of zoology in the University of Havana. Of his many useful papers, the most extensive are his "Reconstrucción de la Historia Natural de la Isla de Cuba," followed by a "Reconstrucción" and an "Etno-zoología" in which the fishes are elaborately catalogued. Joy devoted himself solely to the fish fish fauna of his native island, in which realm he was justly recognized as a ripe scholar and a broad-based gentleman. A favorite expression of his was "Cuba es mi patria, yo no soy un extranjero en esta cosmópolis."

Dr. Aley also brought attention to the March, 1937, issue of *Herpetologica*, which contained an article, "Felipe Joy y Cuba and his 'Reconstrucción' by R. S. Janzsoon (American Bureau of Natural History). Joy's very early account of *Amecichromis* fishes is discussed in the following excerpt from that article:

"In his essay on the small freshwater fish of Cuba (date 1891-1895 inserted by Dr. Aley), he writes thus somewhatly [sic] (p. 17): 'If we consider the small size of these fishes, we might be inclined to look upon them with contempt, and if we realize that they live in the lakes, creeks, and streams of our fields and gardens -- which they share and pollute with their presence at the same time as, by a decree of Providence, they are purifying these waters by eating the algae and floating the organic bits of matter -- we must look upon them as useful little fellow creatures and consequently also give as pleasure as they are innocent. Whoever contemplates nature will not disdain these tiny fish in their games, their love affairs, their little wars, their peevish evolutions, their flashing and rapid flight. At times they come together in numerous clusters, at times they sail about on by one foot above the bottom and into which they plunge at the slightest sign of danger and hide in the pebbled water. Sometimes they come to the surface to capture the flies and ants which other struggles and other games have precipitated into the liquid element. Or else they swallow the seeds blown by the wind and dropped along by the current. While the fascinated observer follows the thousand twirlings and twirlings of the fish, he is also delighted by the green, golden, and purplish reflections given off by the glittering scales. Happy indeed is the man who achieves his crystal frontalis with them, and in their company forgets the burden of life.'

"There is doubt even in Joy's instructions to fish breeders: 'All the species of small freshwater fish are viviparous. See man, dear reader, if you like, breed them in a transparent tank in your own room and see them bring forth the fruits of their wombs. You

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will see the recently emerged young move around immediately with ease. You will make note of the day of their arrival, and every week you will record their growth in millimeters. You will soon note that the males are one-third retarded in their growth as compared with the females. You will see how day by day the abdominal area of the female becomes more obese. You will write down the first day that they give birth. How many children (sic) were born? Are you sure that the mother hasn't already eaten some? It is safer to remove the young to another glass bowl. A month later you will see the mother give birth for a second time. If at first she produced 30 young, now she delivers 50. And she does this virtuously, because if you listened to my advice, you will not have introduced a male into the container during the last transfer. There is another delivery the following month and you will make a note of how long these continue. If you don't live of the better, you will finally count 200 young in one delivery. Now we should like to find out if the females who make these deliveries are as virtuous as the mothers; or if they, like *Mormon's* aphids, remain fertilized for nine generations. This is not likely, but you might perform the experiment anyway. And to be certain, be sure to isolate a female from the moment of her birth.' (186.)"

## TRADING COLUMN

Unless stated otherwise, all shipments are at the buyer's risk. Send trading column lists for Jerome Hertel, 2305 Broadway Ave., Asse, Iowa 50010. Next deadline is April 1.

\*\*\*\*\*

Larry E. Neagle, 8. 1903 Nelson St., Spokane, WA 99207. (509)535-2824

**NOTE:** *Aesop splendens*, 6 unsexed fry, \$10.00  
*Poecilia melanogaster*, 6 unsexed fry, \$0.00  
 Minimum order \$20.00 plus \$5.00 AMPD postage.

Doc Allard, R.O. #1, Box #117-A, Wellsville, Pa. 17265.

**NOTE:** *Helarandria formosa* (need females only)  
*Janitoria signat*  
*Poecilia melanogaster*

K. E. Shilkey, 9737 So. Nerlove Ave., Oaklawn, Ill. 60453.

**NOTE:** *Phallopsomaeus caudimaculatus reticulatus auratus*  
*Brachyraphis thalassidroma*

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## TRADING COLUMN, CONT.

John Mangan, 9770 Cleander Ave., Vienna, Va. 22180.

**NOTE:** Back issues of *aquarium* magazine  
 1974 any before 1972, Aug.-Nov. 1972, Feb.-Dec. 1973,  
 Jan.-Dec. 1974, Jan.-Dec. 1975, Nov. 1976  
 Freshwater and Marine *Aquariums* Feb., 1970  
 any other old *aquarium* magazines or books

**NOTE:** 75¢, April-Dec. 1970, 75¢ + 15¢ postage each, or trade for above

This is for you to think about using for ASA. It makes interesting reading and has to be one of the first records of livebearing exhibited in the United States. ROSS SCODLAR.

From *The Aquarium*, October, 1912:

### THE AQUARIUM EXHIBIT

by John Treadwell Nichols

The annual exhibit of the New York Aquarium Society took place in the American Museum of Natural History, New York, October 6th to 13th, inclusive. It constituted what is doubtless the finest collection of living fresh-water fishes which has ever been on public view in America.

The different breeds of goldfish formed a comparatively small part of the collection, yet some fine goldfish were shown and much admired by the visitors. The fan tails and grotesque tailshape eyes of some of them, a monument to the breeder's art, never lose their interest, familiar as they become. To devotees of the goldfish it may have seemed regret that the space allotted to these was limited by other forms, many of which are less adapted to aquaria culture, but most of us were glad to see the new things. Some of these less familiar fishes doubtless find favor simply because they are new; others are veritable living jewels whose popularity must increase with familiarity. The paradise fish with spiky, streaming fins have now become so plentiful in aquaria as to scarce merit mention. The beautiful Indian fishes of the genus *Tetraodon* with iridescent yellow, red, and blue colors, and long streaming ventral fins which they wave so gracefully, call up visions of the mysterious, lustrant tropical waters of that faraway land. The many species of iridescent silver and pearl *guppies* compel our admiration as they float in the still water of the aquaria. But no more attractive fish comes from the continent of Asia than the trim, active, boldly-marked *guppy peris*. Some beautiful specimens of *guppy peris* were very attractive, but this species will scarcely find as much favor as the smaller, more brightly-colored *peris*, while *guppy peris* is a veritable living gem.

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The fighting fish *Betta* were among the most interesting shown. These fishes are kept for fighting by the Siamese, pitted against one another like cock-fights. They build a nest, a mass of floating bubbles under which the eggs are laid and zealously guarded until hatching by the male fish. Such a nest was situated during the exhibition.

One of the tanks contained a pair of south American, *Tetraodon lineatus*, which carry the eggs in the mouth, and these were two allied species which seem to aquaria, but the African species which attracted the most attention were of the common and beautiful butterfly fish, *Pomacentrus*. Several of this new and interesting fish were exhibited, and it was a treat to the collectors who visited the exhibit to see living specimens of it. They were generally light in color, the surface of the water and did not show off well. The species is more of a curiosity than one especially adapted to aquaria culture.

There were many small fish of the family *Poeciliidae* shown from Southern America, which bear their young alive instead of laying eggs, none other so beautiful as *Helarandria formosa*. Some splendid males of this species, their elongated scissor-like flashing iridescent colors, attracted much admiration. Especially spotted *Helarandria formosa* was one of the most beautiful of the live-bearers, and a splendid male (*guppy peris*), almost jet black with gleaming white eyes, was much admired. The males of most of these species are brighter and often quite different from the females.

Several species of *Betta*, not distantly allied to the live-bearers, were interesting, but *Betta* rather stared to see the surface and the others were too sluggish to be aquaria fish of the first rank. Some very beautiful *Betta* specimens from the southern United States were perhaps too large and closer to fish general favor. The species of the Indian genus *Thalassidroma* showed to better advantage in a small aquaria. A number of species were shown.

On one side *Thalassidroma reticulatus auratus*, elegant and pearly, occupied adjacent tanks, beautiful all of them, but less beautiful than a tank of *guppy peris* shown the same.

Numerous species of characids, small fresh-water fishes from southern America resembling our sunfishes, were very interesting. These fish are fairly, but less attractive than some of the more delicate kinds. On the other hand, the genus *Tetraodon* from the same region are so beautiful and graceful as they are new and interesting. They are quite unlike any fish from southern regions, resembling somewhat both *sturgeon* and *catfish*, with superficial resemblance in form and in the shape of the fins to that of the *herring* on the back to the *salmon*. *Tetraodon lineatus*, marked with red, and *guppy peris*, with a black longitudinal stripe, were very attractive. An allied species (*guppy peris*), of which there were two or three specimens shown, had special interest for the collector, and two gobies (*guppy peris*) were interesting because an entire tank in aquaria.

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A single specimen of *Betta* *guppy peris* was shown. Its iridescent black markings, activity and beauty made it a very attractive aquaria fish.

In a large tank at the end of the exhibition room was an African *guppy peris*, an oval-like form with two pairs of fan-like fins. The males were the live fry up at certain times of year, and it then became common in the tank, dried out and frozen all. The specimen was shipped to the American Museum of Natural History, New York, in a tank of hard water. When it arrived the tank was carefully cleaned and aerated, and the fish readily took up aquaria life again in the tank and all came developed an appetite for fish worms.

The exhibition, being arranged especially for the tropical fishes which made up so large a part of it, did not contain many of the colder-water *guppy peris*. It is only necessary to mention that the *guppy peris* was on view. It was disappointing to see that some of our native fishes were not shown, but they had the consolation of a splendid tank of red-bellied fish and some lively specimens of *guppy peris*.

A special feature was made of young fishes, and a great amount shown. The possibility of growth of some of these raised little interest, especially where they had been kept in outside tanks, was remarkable.

One striking thing about the exhibition was the variety of people it attracted to. It was of course of particular interest to the naturalist and to persons interested in aquaria, while the fishes, and their water-plant surroundings, made a strong appeal to all lovers of beauty and there were always children in the room admiring the pretty colors, fascinated by the whiteness of the striped Indian catfish, getting an insight into an unknown life below the surface of their ponds and streams. Their imagination stirred by seeing the chinking perch and hearing of its capture out of water.

The largest daily attendance at the exhibition was on Sunday, October 6, when 1107 persons visited it.

To the editor: I am writing to you regarding a great problem I seem to be having. The problem is that whenever I write to some members of your society concerning the exchange and purchase of fish I have very little success in getting replies and if I do get replies they nearly always say that they will not send any because of the cost even though I am willing to pay.

I would be very grateful if you could put me in contact with some members of your society who would consider sending some fish to me.

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I have just returned from a visit to Germany where I visited a friend of yours, Mr. Manfred Meyer. He gave me some very good fish and I had a tremendous stay out there. MIKE THOMAS, 41, William St., Yaphank, Rononia, Mid-Glam, South Wales, Great Britain.

Editor's notes I, for one, am willing to ship overseas, even though it involves a little extra red tape at the post office, and usually have had good success with fish making the trip alive if they are shipped on Monday, not later in the week. Perhaps some of you will be willing to help Mr. Thomas.

To the editors: In July, 1978, we formed the "Southern Livebearers Aquatic Group" in the U.K. and I am the Chairman.

Our object is to keep and breed as many species of livebearers as possible and to maintain the true natural species as well as the cultivated varieties. We are interested in joining your society if possible as an affiliated society, otherwise I and others are interested in becoming individual members.

Our object in this is to exchange information and journals. We are also keen to acquire any "new blood" to keep our strains strong and also to acquire any species we do not have.

Species we have at present are roughly as follows:

*Ailans cultratus*  
*Ameca splendens*  
*Ailans belianax*, very short on these  
*Macropodus chinensis*  
*Macropodus opercularis*, very short on these  
*Gambusia affinis* and *G. g. holbrooki*  
*Gambusia pumila*  
*Cirratulus falcatos*  
*Cirratulus metallosus*  
*Cochonia aripicaria*  
*Stenandria blanda*  
*Stenandria fuxma*  
*Cochonia lineata*. There are only 4 in the whole of U.K.  
*Limnoria limnorum*  
*Stenandria iridulifer*  
*Chalmonotus apus apus*  
*Chalmonotus quadricolor*  
*Chalmonotus hawaiiensis*, very short on these  
*Proclia dardanicus*, very short on these  
*P. melanostoma*, *P. pleurostictus*, *P. orri*, *P. melanostoma*,  
*P. vittata*, *P. vivipara*  
*Proclia melanostoma*  
*Zenopsis zoeus*  
*Zenopsis milleri*, *Z. montezuma*, *Z. pygmaea*, *Z. shubini*, *Z. somaliensis*, *Z. halleri*

I look forward to hearing from you re membership and re the possibility of fishes being available from you. DAVID M. COMBRIDGE, 7, Cedar Avenue, Wickford, Essex, England.

FROM THE EDITOR: As you see, LIVEBEARERS has gone to a smaller format. This will save printing cost and postage, and will eliminate the need for AIA members to assemble the bulletin.

Please write to me if you are willing to volunteer for any of the following:

- (1) Make an index for LIVEBEARERS 25-42.
- (2) Handle storage, sale and mailing of back issues.
- (3) Handle storage, copying, sale and mailing of tapes.
- (4) Handle storage, sale and mailing of special AIA publications, which will be published if someone will do "this job".

As always, we need articles from members, and would like to increase the number of photos and drawings if we can get them along with the articles. Please contribute if you can.

AIA had a 5% renewal rate in 1978. This is about average drop-out rate for a specialty club.

#### LIVE FOOD RECIPE

(reprinted from TROPICAL SWIMS, San Diego Tropical Fish Society, Jan., 1977.)

Tom Samman of York's (and the Southern California Allisfish Club) has a method for keeping white worms that in the best I have ever seen. She raises her worms in a box with several layers of 1/2-inch polyfoam sheets laid one on top of the other—and no dirt! She simply places food for the worms (she uses Tubifex) between two of the top sheets, and the worms crawl up to it to feed. The box in which the worms are kept is covered to keep in the moisture they need.

Tom says that she has seen this done with a box of dirt below the sheets of polyfoam and without any dirt whatsoever in the box, but seems to work. In either case, the advantage is clear. The worms can be scraped off the polyfoam without getting a lot of dirt, too. The old process of separating worms from dirt are thus totally eliminated.

The worms prefer a darkened (or dimly lighted) location and will come up to feed more readily if provided with it. They also dislike excess heat. Fog rots around this via an old refrigerator which she keeps for her live food cultures. She uses it during hot spells, turned down to its lowest setting so that growth processes are not unduly slowed. Old chamber refrigerators can be picked up for a song. It sounds like a good way of keeping other cultures going through the hot summer and fall months, too.

With white worms another problem has always been aites which sooner or later parasitize a culture. With polyfoam sheets, nit infestation is less of a problem than with dirt. Keeping a glass cover on the culture also helps. It not only keeps moisture in, it keeps flying and crawling invaders out of your culture. However, if the cover fits snugly, you should use a wooden box for your culture, not some impervious material like plastic or glass. If a culture cannot breathe it is apt to "sour." Until the number of worms is built up from your starter portion, remember not to put in too much food, for this too can invite trouble.

If you heed the above warnings, Feg's system should soon supply you with plenty of white worms. Have at it!

