DELTA TALE

Sept. 1987 vol. 18 #9

potomac valley aquarium rociety



DOTOMAC VALLEY AQUARIUM SOCIETY.



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FAAS: Gerry Hoffman Delta Tale: John Mangan

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FRUM THE EDITORZ DESK

I have several things to mention this month. First is that you should all circle Nov. 7 & 8 on your calenders. These are the dates for the PVAS Fall Auction and our second Fall Workshop. Last Falls workshop featured an excellent group of speakers and everyone that attended had an informative and enjoyable day. Details on this years workshop are still being worked out as of the time I'm writing this. Watch this space for further info. next month.

Next: at the Aug. board meeting I was volunteered to be chairman of the nominating committee for 1988 PVAS officers (I knew I should have stayed at the beach an extra day). Elections are held at the Nov. meeting. The following positions are open: President, Vice President, Treasurer, Corresponding Secratary, Recording Sec., and Board of Governors (2 openings). I ask you all to consider running for one of these offices, no experience necessary. If you are interested please contact me as soon as possible. The nominating committee will be meeting aprox. one week after the Sept. general meeting so that the slate of candidates can be printed in the Oct. Delta Tale. Nominations are accepted from the floor at the Nov. meeting prior to the election, but it will make my job much easier if you make your intentions known to me early. See me at the Sept. meeting or I can be contacted by plione at (703) 938-4778 or 573-4400.

This leads me to my next topic- in addition to looking for people to run for offices I may also need a few more people to serve on the nominating committee. Please contact me at or before the Sept. meeting if you would be willing to serve on this committee.

The final topic for this month- in the Dec. 1986 issue of Delta Tale I announced my wish to retire as Delta Tale editor. I stated then that I would stay on until a replacement was found. When I wrote that I it to be for a month or two. It has now been about eight months, and I'm still here. I am now announcing that the Dec. 1987 issue of Delta Tale will be my last. As I have stated in the past, many times, I have a number of other projects I am working on and I do not have the time or energy to put out the quality of magazine that the club is capable of. Anyone interested in the job please contact me. No experience is needed I can teach you the few things you need to know in one evening. When I took the job I couldn't even spell editor, now I are one. Don't wait until Dec. 30th to come forward if you are interested in the job. The sooner someone is found the better.

Now that vacation time is over I hope to see all of you at

the meeting. Until then...

TRADING POST

Ads for the trading post should be sent to Tom Hetzel, 5601 Seminary Rd. #1702, Falls Church, VA 22041 by the 15th of the month prior to publication.

For Sale: Custom built 80-gal. glass pyramid tank, 3 ft./side with mirror top. Makes interesting room divider or novelty tank. Needs cleaning - previously used for salt water.

Call Chuck Rothbard 890-3471

For Sale: Pseudo. lombardi kenyii approx. 2"
Males: \$2.50

Females: \$3.00

P. auratus Male 3 1/2" (ready to mate) \$5.00

Scolofi males: 3" \$3.50

Cail Bob Daniel, College Park 441-1988

WHAT'S HAPPENING IN SEPT.

Program- Gene Aldridge on his recent collecting trip to South America.

Door prize & Raffles- lots of good stuff to be given away.

Mini-auction- sellers may bring up to 3 bags each buyers can snag up as many bargains as they can carry home.

Bowl Show- bring fish, win a ribbon. See Bowl Show page for classes.

Getting more out of the hobby by George White, PVAS

Most aquarium hobby books describe the various species and provide only basic information about maintaining and spawning them. A rare few tell us much about our wet pets and what's really happening in our aquarium, (Paul Loiselle's excellent book, The Cichlid Aquarium is one of the few that come to mind.) Another is Eierlegende Zahnkarpfen (translation: egglaying toothcarps, aka killifish) by Reinhold Bech, an impressive, thought provoking book published in East Germany in 1984. This book goes well beyond the basics, raising several intriguing questions. For example, why do we not take the time to really observe and study our fish? One fascinating chapter presents some interesting diagrams of spawning rituals only briefly described in American books.

Perhaps the most interesting chapter in Bech's book is the one on the sex ratios of spawns. It raises some interesting questions about whether or not we can exercise some control over the spawns of our little jewels. The author mentions that in some cases recorded information on various factors such as water quality and chemistry sheds some light on why we get predominantly male or female spawns. Bech also recommends that further research would be helpful. For one thing, it would be worthwhile to see if some of his spawning research results could be duplicated in the U.S. and to test some of his hypotheses. Furthermore, environmental and parental factors may be at play in the spawns of other popular aquarium fish.

Wouldn't we all like to find a way to get the perfect spawn? Bech's chapter on sex ratios brings an intriguing thought to mind: our club could develop a valuable data base for analysis by recording precise information on a number of spawns of various species (covering details such as water chemistry, water temperature, age of parents, size of spawns, etc.). Maybe then we could find ways to improve our spawns. This would require that forms completed for the breeders award program contain only slightly more information than is presently requested—and that certain individuals with wet thumbs take the time to put pen to paper, (I'm not going to name any names, JL.)

Rather than summarize this chapter (pages 26-28), I have prepared a quick translation which follows.

(begin quoted text) Sex ratios in spawns

The spawns of egglaying toothcarps (killifish) provide their keepers with nasty surprises again and again in regards to their sex ratios. One breeder finds only three males in 100 fry, the rest being naturally female. With another breeder the relationship is reversed. As many different results as exist, there are as many opinions as how to avoid these uneven sex distributions.

For an understanding of the problem of sex determination, a basic knowledge of genetics is necessary. Therefore, a concise presentation of genetic principles follows:

- l. Most animals possess in addition to the "normal" chromosomes, an additional pair of so-called sex-chromosomes, which are designated as X and Y-chromocomes. In the case of females, the two sex-chromosomes are of the same type (XX), in the case of males, a mix (XY). During fertilization there are but two possibilities XX and XY, the two sexes. Sex is inherited in this manner by guppies and all mammals including humans.
- 2. In the case of certain insects, sex is not determined by the XX and XY mechanism, but rather the females possess two X-chromosomes, while the males possess only one X-chromosome. This situation is designated as X0. This kind of mechanism is--according to information available up until now--not exhibited in egglaying toothcarps.
- 3. In the case of many species of our show fish, in particular the toothcarps, sexual differientation results from polymers and polygens, so-called polyfactored mechanisms. That is to say, there exist no specific sex determinant chromosomes, but rather many genes that decide the sex of each individual. These so-called M-(male-deciding) and F-(female-deciding) genes are localized on various chromosomes, and depending on their total, e.g. majority in the fertilized egg cell, determine the fish's sex. Therefore, in the case of polymer sex determination advance prediction of the decendents of a breeding pair is uncertain. The only way to exercise a degree of influence is the possibility of breeding lines that tend to be rich in either male or female offspring. Such selections must (because they are "blind") be based on spawning a number of generations.

The most famous representative of polymer sex determination in the narrow sense is the live-bearing toothcarp, the swordtail, Xiphophorus helleri. Breeding results which at first glance appear to be contradictory, are simply explained through the following hypothesis, that there are no sex differientating chromosomes in the swordtail. In addition to the Xiphophorus, it has been found that a large number of show fish have a sex determination mechanism that follows the polymer pattern, which, however, have not been so extensively researched. To this group belong, for example, Limia, Macropodus and almost all the Cyprinodonts.

In the case of most species of <u>Cyprinodonts</u> it appears that the total of the M-genes equals the total of the F-genes, thus causing the sex determination of such "balanced" species to be largely dependent on "environmental" factors. Thanks to the help of sex hormones, functioning males or females develop.

Actually, even genuine sex changes have occurred, for example, with Aphyosemion australe, one of the earliest and longest hobbyst-bred fish. In the case of Rivulus marmoratus, most are hermaphrodites, that is to say, eggs are produced by an inner self-fertilization. In zytological examination of 60 species of egglaying toothcarps, Scheel could not find a specific sex determining chromosome. He collected the following information on this problem: the sex ratio of the spawn is largely dependent on the breeding pair, the special conditions of the breeding, the conditioning of the pair, and the handling of the spawn; e.g. the fry.

Regardless of this, however, in Denmark, using line-breeding several almost uninfluencible sex ratios were found:

N. palmquisti 90% females, 10% males

N. quentheri 90% females, 10% males

Aph. sjoestedti bD% females, 40% males

Aph. cognatum 50-50%

Aph- labarrei 40% females, 60% males

Aph- cinnamomeum 40% females, 60% males

In the case of <u>Epiplatys</u> and <u>Aplocheilus</u> species the influence of environmental factors was most easily demonstrated. In addition it is noteworthy that in aquarium breeding, an excess of females was almost always recorded. According to our own experiences (those of the East German author, who does not indicate how many pairs were used in his experiments or the number of spawns analyzed) with our lines of <u>Cyprinodonts</u>, the following was determined:

- 1. In order to obtain a broadly equal mix of the sexes, spawning periods of over four weeks are required. Additionally, it is necessary to use breeding stock of approximately the same age. These results were obtained with the following species: Aphysemion australe, A. filamentosum, A. sjoestedti, Roloffia occidentalis, Nothobranchius quentheri, Cynolebias alexandri and C. nigripinnis. Contradictory results were had with: A. gardneri, N. kirki and Epiplatys dageti.
- 2. The sex of the younger partner predominates in determining the sex ratio of the offspring. For this to occurathe age difference between the breeders must be at least three to four months. This phenomonen was noticed to be very pronounced in Epiplatys species, but was also observed with Aphyosemion bivittatum and A. gabunense. Rivulus species react in the opposite way.
- 3. Up until now there is no substantiation of the alleged necessity in a breeding set-up of having one male and several females. The only reason for such a set-up would be to deflect the often hard driving of the male. (a very good reason when aggressive species are involved--translator's comment.)

- 4. Because of the different sex ratios that are obtained with individual males, it is recommended that short spawning periods of one to three days be used, and that the males be switched. Using this method almost even male/female splits were obtained in the offspring of: Aphyosemion australe, A. gardneri, A. sjoestedti, Roloffia occidentalis, Nothobranchius quentheri, Nothobranchius quentheri, Nothobranchius quentheri, Nothobranchius, Rivulus nolmiae, R. milesi and Aplocheilus lineatus.
- 5 Placing Epiplatys dayeti in soft water (approximately 5 dGH a:d pH b.0) produced 90% females in the offspring, in hard witer (approximately 24 dGH and pH b.0) roughly 90% males. The same breeding pairs were used in both set-ups. The hatching r te per spawn was more limited in the hard water.
- b Placing Aphyosemion gabunense in acid water (pH 5.0) p oduced predominantly female fry₁ while less acid water (pH 5.) resulted in more males.
- 7. The use of several pairs at the same time produced more balanced sex ratios than did single pairs or trios (one male and two females).
- A. Rearing conditions with constant temperatures from 22 to 25 degrees centigrade resulted in more females in the offspring while fluctuating temperatures during raising tended to produce a surplus of males.

As important as a 50/50 sex ratio may be for the hobbysts who breed (and sell), under natural conditions even with a surplus of males, only a few will be able to successfully breed. As we can also determine in a species tank, only a few fish possessing territories account for the next generation. Weaker males seldom succeed in breeding since the "lord of the tirf" quickly interfers and drives away the competition.

In conclusion, it can be said that we are far from determining the exact causes of the often extreme sex ratios in spawns. The largest holes in our knowledge appear to be in the exact observation and recording of the handling of the spawn and its storage. (end of quoted text).

The PVAS Board of Governors convened at 7:30 pm on Monday, August 3 at the home of President Gene Aldridge. Also present were Ray Hughes, John Mangan, Bob Pallansch, Pete Thrift, and Kenny Warren.

Items discussed:

Siting of 1988 Spring Show: Contenders are Manassas Holiday Inn, Mama's Italian Resturant; (Fairfax Circle), and The Falls Church Inn. (The '87 Fall Workshop will be 7/8 November at The Falls Church Inn.)

PVAS has approximately 200 old plastic air valves which will be sold at cost to members or auctioned. Kenny Warren will be paid \$150.00 for the 55 set-up which he won at the spring raffle and it will be used for the fall raffle, to save buying another.

John Mangan was voted chairman of the nominating committee for '88 PVAS officers; he will contact potential committee members.

The September program will be a preliminary report re. Gene Aldridge's recent collecting odyssey.

It was agreed to drop members whose dues have been in arrears since December, 1986.

Shirt ideas settled on a polo shirt with an original discus print in four colors.

PVAS' application for tax-exempt status was denied by the IRS; but basically it can be approved if we apply as an educational organization. This will be done.

The meeting adjourned at 9:15.

Robert Paliansch
Corresponding Secretary

BOWL SHOW REPORT FOR

	August
CICHLIDS	EGGLAYERS/LIVEBEARERS
sew World Dwarf	Killifish
1st A. kleei-J. Kooken 2nd 3rd	1st A. bivitatum-J. Steringer 2nd A.celiae - D. Mann 3rd N. guetheri-T. Fitz
istlake, Non-Mbuna j	Catfish, Non-Corydoras
1st 2nd No Entries 3rd	1st Synidontis Spec-J. Bennet 2nd 3rd Bumble Bee Cat-J. Steringer
pen	Open
1st Marble Angel-J. Bennet 2ndPink Convict-J. Kooken 3rdMarble Angel-J. Bennet	1st Badis badis - J. Steringer 2nd Alibino Cory - J. Bennet 3rd Black Moore - J. Bennet

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J. Bennet	2	6	16	J. Benet	4	9	22
D. Sun	õ	ò	3	J. Steringer	2	2	6
J. Kooken	2	2	3	R. Hughes	0	0	6
R. Hughes	Q	0	a	D. Mann M. Brinac	1	1	Š
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Sept. Catagories

Cichlids: Angelfish & Discus, Non-riftlake African, Open

Egglayer/Livebearer: Livebearer non-guppy, Sharks & Loaches, open

YOU LIKE DWARF CICHLIDS BUT . . . OR THE ART OF DITHERING

By John Chapek

As most people observe Dwarf Cichlids in their dealer's tanks, they usually see small, non-descript fish cowering, fins clamped, trying to hide behind or under the filter. If the tank is crowded enough, they try to become part of the bottom of it. The reasons for this unusual behavior are many but the two important ones are:

- 1. Lack of suitable hiding places for the number of fish involved.
- 2. Lack of a "dither" fish.

Let us handle each of these problems as they first come to us. A dealer is in business to sell fish. In order to sell fish, the dealer must display them so they can be readily seen. Often times this means aquariums simply furnished with a bare bottom and a bow or sponge filter, or possibly an undergravel filter and suitable substrate. A dealer must be able to catch the fish rather quickly so decorations, rockwork, and plants are often limited to aid in a quick catch so that the cat cher can move to the next customer. It is not convenient to have to move around decorations (hiding places) to catch "that one".

Lack of a "dither" fish, as a number of you sit there scratching your head saying to yourself what is a dither fish? First let me say that many stores will limit the number of types of fish to one or two per aquarium but in the case of Dwarf Cichlids, they must be kept by themselves because they are after all, cichlids.

We will now begin. A dither fish can be nearly any type of fish that is generally comfortable under any circumstances be it a bare or heavily planted tank. They may be egglaying or livebearing in reproduction method. They may be schooling or prefer to swim as individuals. The main point is they should be of peaceful but not timid nature. Excellent examples are Danios, small Tetras, Livebearers (except fancy Guppies), Barbs, Rainbowfish, Angelfish and just about any other that fits our requirements.

My first experience with dither fish goes back a number of years and was really an accident. I was given a pair of Apistogramma cacatuoides and was told how easily they could be spawned. After months of pampering in a 10 gallon aquariom with floating Water Sprite and lots of flower pots for spawning/hiding, nothing happened. As a matter of fact, the fish were seldom seen. I tried water changes, live foods, and anything else I could think of but nothing worked. I owe my later success to some live food (Platy fry) that they didn't eat and grew to nearly full size. My Apisto's had learned that if they didn't react when food was introduced that they simply didn't get any. Soon they were out and about and in a short time I was blessed with a clutch of salmon red eggs, not in or on a flower pot but on the front of the aquarium in plain view.

Not too long ago (Thanks to Liz & Jim) I was lucky enough to purchase some Pelmatochromis thomasi a rather unique and attractive dwarf. Well all of the sudden I needed a dither fish not only to keep them comfortable but to give them someone to Chase around besides one another. I wasn't convenient to get to a pet shop so I used a 10 gallon tank equipped with a box filter and in went my 6 Pelmatochromis along with two trios of Rivulus tenius. For the benefit of the killifish I added a large nylon spawning mop and knowing I had broken all the rules let it be. In less than a week I had two spawns, one in each of the front corners of the tank and within 10 days of the first spawns they did it again.

Here I sit at my desk with a pair of <u>Pelvicachromis taeniatus</u> herding their 3rd spawn before me because they know hiding places are near and the Rummy Nose Tetra sharing their tank show them there is nothing to fear except a missed meal if you're not front and center.

Last but not least I owe a Best in Show Trophy to some Madagascar Rainbowfish (Bedotia geayi) who roomed with some Checker board Cichlids (Crenicara filamentosa). My second best male was anything but the typical Dwarf Cichlid at a show. He spent the entire weekend hung in the center of the bowl spreading his fins as if to show the world how bold and beautiful he was. The Checkerboards spawned four times in the community situation but the eggs never hatched.

The main points in keeping Dwarf Cichlids are:

- 1. Comfortable surroundings.
 - A. Hiding places.
 - B. Plants, live or plastic.
- 2. A dither fish as a tank mate.

An added advantage to keeping Dwarf Cichlids is they allow us to keep these Zebra Danios, Neon Tetras, and Swordtails we're so fond of but are afraid our friends (the ultimate hobbyists) would kid us about. After all they're our dither fish!

Reprinted from THE WET THUMB, the bulletin of the Journal of the Cleveland Aquarium Society.

THE CELEBES HALFBEAK By Joseph Vara, WNYAS

The Celebes Halfbeak, Nomorhamphus celebensis, is an interesting and unusual livebearer native to the island of Celebes in Indonesia, where they inhabit fast-flowing streams on the southern and central portions of the island. They are fairly new to the aquarium hobby, having first been imported into Germany in 1975.

Compared to other halfbeaks, the Celebes halfbeak is quite colorful, with males having more color than the females. The basic body color is a pale gray or tan, lighter and silvery on the underside. Fin color is variable, possibly due to two or more "strains" being maintained in the hobby. In my males pectoral, pelvic and anal fins are red with irregular black edging. The dorsal fin is black with some blue and red toward the base, and the caudal fin is red with red and black in some or all fins. In other "strains", males can have solid black fins and females can have solid black or black-streaked fins. These fin colors are more intense when the male is in breeding condition and is displaying to the female.

Besides being more colorful, males can also be distinguished from females in several other ways. They are smaller, reaching 2 to 2 1/2 inches in length, while females reach 4 to 4 1/2 inches and are stockier. Males have a smaller modified anal fin, the rays in the first half of the fin being shorter than the rest of the rays. Males in the wild also have a hook-like appendage on their lower jaw which is blue and black, but this appendage never fully forms on tank raised fish.

Celebes halfbeaks, being peaceful and colorful, can be kept in a community tank or in a tank of their own. Tankmates should be chosen carefully, as Celebes halfbeaks have large mouths, especially females. Their tank should ideally be twenty gallons or larger, and be well filtered. Water changes of at least 25% should be done weekly, the larger the better.

Contrary to some reports, they will accept non-living foods such as flakes and frozen brine shrimp, and these can be fed as a basic diet. They can also eat earthworms, mealworms, fruit flies, freeze dried plankton and krill, frozen bloodworms, and small fish (1-1/2" long) such as guppies and danios. Some of these foods should be fed occasionally to vary the diet.

Once the fish are mature, breeding is just a matter of waiting for fry. Although they reach sexual maturity at five to six months of age, you may have to wait a good twelve to fifteen months from birth before females drop young. Females give birth about once a month to small broods, ranging from three to five fry for a young female to no more than fifteen or sixteen for a large adult. Pregnant females appear noticeably heavy, and should be isolated to a separate five or ten gallon tank. The tank should be heavily planted with floating plants and java moss, or you can use yarn spawning mops. The temperature should be about 80° and the female should be fed frozen or live foods several times daily. The female must be kept well fed and the tank must contain plenty of cover if the fry are to survive. With her large mouth, she can easily eat all young as fast as they are born.

After the fry are born, remove the female as soon as possible. The fry are large at birth, measuring 3/4-1" long. They can be fed baby brine shrimp, daphnia, etc. and can be kept in a 2 1/2 gallon tank for the first week, although a 5 gallon would be better. They should be fed at least twice daily and when two weeks old, they can take shredded frozen brine shrimp. At six weeks, the rapidly growing fry measure 1 1/2" and can be sexed. Males will be slightly smaller, with more color in the fins and a smaller anal fin. At this age, they should be in a ten gallon or larger aquarium.

Whatever size tank you have the fry in, large water changes should be made, since the rapid growth of the fry requires clean water. This means fifty to one hundred percent weekly water change, twice weekly if the tank is five fallons or smaller. Once the young are five to six months old and in a larger tank, water changes need not be as large.

Finding Celebes Halfbeaks is not that easy, as they are very infrequently seen in fish stores. I have seen them in a store only once, and even then it was a tankful of males. The best way to obtain some is to join the American Livebearer Association, where many rare livebearers, including the Celebes Halfbeak, are kept by members and occasionally offered for sale.

Represed from NEPTUNE'S NOTES, The Bulletin of the Western New York Aquarium Society.

MULTIPLE SPAWNING WHEN YOU LEAST WANT IT (or need it)

Jim Webb

Its your hour Mr. Webb, so lets start at the beginning. Well Doc, it all started when I was a little boy, mu granny had a 10 gallon tank...Not quite that far Wr. Webb, tell me about your recent most recent problem.

You see, most people call it Cichliditus or refer to us as Cichlididiots or just plain fish nuts. I have a hobby or should I say it has me; well anyway the problem is I am moving. That's not so bad in itself but we have 40 aquariums and a large fuzzy dog. We should be used to it by now, we have moved about every 14 months for the last five years. It is a wonder the fish we keep have time to spawn in between moves. We (Mrs. Webb) always start the same way. We run out of room and move to a larger house so we can keep our finny friends happy. As we get ready to move I start sorting fish in the fish room and throughout the house. Too many, too ugly, too skinny, or too delicate. The less I have to move the better I like it.

Things were in this stage and we were 60% packed waiting for our new house to become vacant when all my favorite fish decide it is time to breed. Two weeks before we move, seven species spawn like there was no tomorrow. Since most of the fish were mouth brooders it still wasn't going to be insurmountable, I would just move fish, fry and all in their handy built in containers.

I didn't account for Murphy's Law, if something can go wrong it will and at the worst possible time. My new house didn't become vacant on time. So now I've got all these little bitty fish to move. All this still wouldn't be so bad, but now the date we set for our local fish club meeting is the weekend we are moving, it's all printed up and mailed to everyone, and it's at our new house. Wonderful.

After four moves the few friends I have left have a number of excuses ranging from "My dog has a bone in his leg; or My humped back sister straighted up"; and my favorite "No I can't help, I crushed two disc last time I helped you move". Oops.

I am certain everyone in the T.C.A. is going to believe I planned it this way. All in all, it is not so bad, we do receive plenty of help from our friends. All you have to do is have a keg of beer and food.

Over the years we have learned a few tricks which are helpful in a move like this. We bought this Little Giant submersible pump that pumps 870 gallons an hour. It comes in real handy. I use it all the time, it definitely makes water changes at the house easier and quicker. We also picked up some plastic barrels on dollys called Bruts, made by RubberMaid. They are duel purpose, you can move water PAGE

in them, or they act as rolling platforms when you set a large tank on top of them. The Bruts hold 44 gallons by the way and make moving a little simpler. When you combine the pump and Brut you can't make it any easier. You can place the Brut in the back of a truck, set the pump in the tank you want to drain, run the hose into the Brut (the pump makes water run up hill) and there you have your same old water to place the same old fish in, and it just seems like a water change to them.

Well I guess my main problem Doc, is not that I am moving or that I have 40 tanks, I think my problem is I like it. Is that crazy or what Doc?

Yes Mr. Webb, that is a little strange and you are a sick puppy. I also believe your hour is up, but I have this 700 gallon tank and was wondering if you could help me move it? Not a chance, my arms are still 4 inches longer than they used to be.

Reprinted from the CICHLID TAILS, The Texas Cichlid Association, Dallas, Texas, September/October 1985

PAGE

DOTOMAC VALLEY AQUARIUM SOCIETY

POST OFFICE BOX 6219 SHIRLINGTON STATION ARLINGTON, VIRGINIA 22206

APPLICATION FOR MEMBERSHIP

DATE19						
NAME						
STREET						
CITY						
TELEPHONE H	w					
OCCUPATION						
Where did you hear about PVAS/get this application?						
Number of tanks Time in hobby						
What can this club do for you ?						
What do you want to do for the club ?						
Membership dues for the Potomac Valley Aquarium Society are:						
Family: \$12.00 Individual: \$10.00	Corresponding Junior (under	g: \$7.00 r 18) : \$5.00				
81 A 12 A		to address above				

MARYLAND

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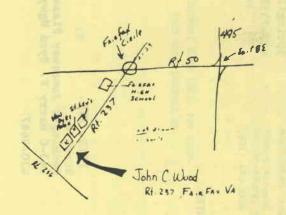
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Penn Fish Culturist Soc 1823 Dudley St Philadelphia, PA 19145

The Potomac Valley Aquarium Society will meet on the following dates in 1987:

Jan. 12 Feb. 9 April 13

July 13

Oct. 12 NOV. 9

March 9

May 11 June 8 Aug. 10 Sept. 14

Dec. 14

Meetings are held at the John C. Wood Facility, RT. 237 (Old Lee Hgwy.) Fairfax City, VA. Doors open at 7:30, meetings scart at 8:00 PM. Everyone is welcome.