

DELTA TALE

June 1989

Spring Show Results!

Official Publication of the
Potomac Valley Aquarium Society

The Delta Tale is published for the benefit of the Potomac Valley Aquarium Society, Inc. (PVAS). The PVAS, a non-profit organization, was established in 1960 for the purpose of furthering the aquarium hobby by dissemination of information, encouraging friendly competition, soliciting participation in its shows, and promoting good fellowship. Correspondence should be addressed to PVAS; P. O. Box 6219 Shirlington Station; Arlington, Virginia 22206-0219. Original articles and art work may be reprinted by other non-profit organizations if credit is given to the author, Delta Tale, and PVAS. Two copies of the publication should be sent to the Delta Tale, c/o PVAS. Please place the author's name on one copy to ensure that it gets to him/her. PVAS and Delta Tale disclaim any responsibility for content or availability of advertised merchandise or services in these pages. Customer satisfaction is a matter to be worked out exclusively between the advertiser and the buyer. All material for inclusion in Delta Tale must reach the editor by the 12th of the month prior to publication

1989 PVAS OFFICERS

President:	Pete Thrift
Vice President:	John Stieringer
Treasurer:	Gene Aldridge
Corresponding Secretary:	Lea Spickler
Recording Secretary:	Bob Pallansch
Agent:	Gerry Hoffman

1989 BOARD OF GOVERNORS

Kenny Warren - 90	John Jessup - 89
Ray & Barrie Farmer - 90	Ray Hughes - 89

1989 COMMITTEE HEADS

Auctions:	Gerry Hoffman
BAP:	John Jessup
HAP:	
Library:	Ray Hughes
Membership:	Lea Spickler
Spring Show:	John Stieringer
Bowl Shows:	Barrie Farmer
Programs:	Tony Fitz/Larry Wilkie
Fall Workshop:	Gerry Hoffman
Ways and Means:	Ric McKay
FAAS:	Gerry Hoffman
Delta Tale Editor:	

Printed by TOP CAT Printing, 164 Colburn Drive, Manassas Park, VA

El Presidente:

WELL, GANG, WE DID IT! Despite rains of Noachian (a Paul Loisel term) proportions, our 1989 show and auction was definitely a success, with 194 very high quality entries from 24 participants in the Saturday show, and around 560 items and over 150 bidders in the Sunday auction. The fish were truly outstanding, the auction will net the club over \$1000 for future programs and activities, and we had a great deal of general public traffic all weekend. Our weekend has unquestionably helped both our club and the aquarium hobby in the Washington area!

I would like to thank all those who worked so hard to make this year's spring madness the success that it was. It always takes a great deal of work to bring off a show, and having to erect the stands, register all the entrants, and coordinate the judging of several hundred bowls and tanks all in one day made this year's show especially tiring. Thanks to all those who showed up at 6 AM Saturday to erect the stands, all those who registered 194 show entries, all those who judged those entries, all those who tallied the judges' scores, all those who registered the 560+ auction items, all those who recorded the auction transactions, all those who auctioneered, all those who worked as auction runners, and finally all those who tore down the stands and cleaned up the facility. Special thanks to Dave Shaw and Sharon Boone of Aquaria International and Gerald Pottern of Raleigh Aquarium Society who helped judge our show, to Gerry Hoffman for chairing the auction, and to John Stieringer and Lea Spickler for working especially hard throughout the entire weekend. Our club owes all of you a great deal of gratitude!

The aquarium hobby traditionally goes into a slump during the summer months, but not PVAS. Tony Fitz and Larry Wilkie are working hard to arrange interesting programs for the upcoming monthly meetings (see their committee report elsewhere in this issue), and the Board is trying to arrange several nationally recognized speakers as well. Be sure to continue to reserve the second Mondays of the summer months for our get-togethers! Warm weather just means you can bring fish for the bowl show competition without worrying about too-cool water temperatures!

For nearly all club members, your membership will need to be renewed in June. Please see Lea Spickler or Gene Aldridge to pay your 1989-90 dues of \$12.

I'm sure everyone noticed that there was no May issue of the Delta Tale. This is because the club is still in desperate need of an editor for our publication. Gene Aldridge and myself put this issue together, but we cannot do this on a monthly basis. We will attempt to assemble an issue for August or September, but only provided enough typed material is provided by PVAS members to fill an issue. When the Tale is not published for a month, a flyer will be mailed to all active members before each club meeting. I know this is not a satisfactory state of affairs, but it cannot be helped. PLEASE CONSIDER UNDERTAKING THIS VITAL ACTIVITY FOR YOUR CLUB!!

 * 1989 SPRING SHOW RESULTS *
 * * * * *
 * BEST IN SHOW - Russ Hammond RESERVE IN SHOW - Rick McKay *
 * Spotted Pimelodella Turquoise discus *
 * * * * *
 * TOTAL NUMBER OF ENTRIES: 194 *
 * TOTAL NUMBER OF ENTRANTS: 19 TOTAL PVAS ENTRANTS: 15 *

NOTE: Number in parentheses is total entries for sub-class

I. Livebearers	First	Second	Third
a. Cuppies	No entries		
b. Mollies, Swordtails, & Platies (5)	Bell	Hammond	McKay
c. Goodeids (5)	Mangan	Mangan	Mangan
d. Other Livebearing Fish (2)	Mangan	Pitts	
BEST LIVEBEARER BELL			
II. Egglayers (Non-Cichlid)			
a. Catfish, Corydoras (7)	Wilkie	O'Bannon	Wilkie
b. Catfish, Loricariidae (4)	Aldridge	Bennett	Bell
c. Catfish, Synodontis (4)	Stieringer	Pitts	Bennett
d. Catfish, Naked (2)	Hammond	Aldridge	
e. All Other Catfish (1)	Lindgren		
f. Betta Splendens (19)	Muller	Duley	Muller
g. All Other Bettas & Anabantoids (2)	Bell	Bell	
h. Sharks & Loaches (6)	Mann	Lindgren	Bell/Mathis
i. Characoids, Under 3" Mature (5)	Hoffman	Pallansch	Bell
j. Characoids, Over 3" Mature (3)	Stieringer	Pallansch	Pitts
k. Barbs (1)	Pallansch		
l. Goldfish & Koi (3)	Bennett	Bennett	Bennett
m. Danios, Brachydanios, Rasboras (7)	Bell	McKay	Bell
n. Killifish, Aphyo/Fundulo (27)	Mann	Fitz	Fitz
o. Killifish, Notho/S.A. Annuals (9)	Mann	Fitz	Fitz
p. All Other Killifish (12)	Fitz	Stieringer	Fitz
q. North American Native Fish (1)	Lindgren		
r. Other Non-Cichlid Egglayers (10)	Stieringer	Stieringer	Stieringer
BEST NON-CICHLID EGGLAYER - HAMMOND			
III. Cichlids			
a. NW Large (over 7" mature) (1)	Kulek		
b. NW Medium (4-7" mature) (4)	Kulek	Kulek	Bell
c. NW Dwarf (under 4" mature) (7)	Cohen	Kulek	McKay
d. Angelfish (10)	Muller	Bennett	Bennett
e. Discus (4)	McKay	Bell	Thrift
f. Mbuna (?)	Pitts	Hammond	
g. Tanganyikan (5)	Cohen	Cohen	Pitts
h. Cichlid Pairs (7)	Cohen	Cohen	Cohen
i. All Other Cichlids (4)	Kulek	Pitts	Pitts
BEST CICHLID - MCKAY			

	<u>First</u>	<u>Second</u>	<u>Third</u>
IV. <u>Marine Fish and Invertebrates</u> (6)	Muller	Bell	Bell
V. <u>Family of Fishes</u> (4)	Bennett	Bennett	Hoffman/Bennett
VI. <u>Plants</u> (3)	Hoffman	O'Bannon	O'Bannon
VII. <u>Set Tanks</u>	No entries		
VIII. <u>Dealer Tanks</u> (1)	Aquaria International		
IX. <u>Photography</u>	No entries		
X. <u>Arts & Crafts</u> (1)	O'Bannon		

Thanks to all who entered!
Congratulations to all the winners!

 * 1989 SPRING SHOW RESULTS *
 * * * * *
 * BEST IN SHOW - Russ Hammond RESERVE IN SHOW - Rick McKay *
 * Spotted Pimelodella Turquoise discus *
 * * * * *
 * TOTAL NUMBER OF ENTRIES: 194 *
 * TOTAL NUMBER OF ENTRANTS: 19 TOTAL PVAS ENTRANTS: 15 *

NOTE: Number in parentheses is total entries for sub-class

<u>I. Livebearers</u>	<u>First</u>	<u>Second</u>	<u>Third</u>
a. Guppies	No entries		
b. Mollies, Swordtails, & Platies (5)	Bell	Hammond	McKay
c. Goodeids (5)	Mangan	Mangan	Mangan
d. Other Livebearing Fish (2)	Mangan	Pitts	
BEST LIVEBEARER BELL			
<u>II. Egglayers (Non-Cichlid)</u>			
a. Catfish, Corydoras (7)	Wilkie	O'Bannon	Wilkie
b. Catfish, Loricariidae (4)	Aldridge	Bennett	Bell
c. Catfish, Synodontis (4)	Stieringer	Pitts	Bennett
d. Catfish, Naked (2)	Hammond	Aldridge	
e. All Other Catfish (1)	Lindgren		
f. Betta Splendens (19)	Muller	Duley	Muller
g. All Other Bettas & Anabantoids (2)	Bell	Bell	
h. Sharks & Loaches (6)	Mann	Lindgren	Bell/Mathis
i. Characoids, Under 3" Mature (5)	Hoffman	Pallansch	Bell
j. Characoids, Over 3" Mature (3)	Stieringer	Pallansch	Pitts
k. Barbs (1)	Pallansch		
l. Goldfish & Koi (3)	Bennett	Bennett	Bennett
m. Danios, Brachydanios, Rasboras (7)	Bell	McKay	Bell
n. Killifish, Aphyo/Fundulo (27)	Mann	Fitz	Fitz
o. Killifish, Notho/S.A. Annuals (9)	Mann	Fitz	Fitz
p. All Other Killifish (12)	Fitz	Stieringer	Fitz
q. North American Native Fish (1)	Lindgren		
r. Other Non-Cichlid Egglayers (10)	Stieringer	Stieringer	Stieringer
BEST NON-CICHLID EGGLAYER - HAMMOND			
<u>III. Cichlids</u>			
a. NW Large (over 7" mature) (1)	Kulek		
b. NW Medium (4-7" mature) (4)	Kulek	Kulek	Bell
c. NW Dwarf (under 4" mature) (7)	Cohen	Kulek	McKay
d. Angelfish (10)	Muller	Bennett	Bennett
e. Discus (4)	McKay	Bell	Thrift
f. Mbuna (?)	Pitts	Hammond	
g. Tanganyikan (5)	Cohen	Cohen	Pitts
h. Cichlid Pairs (7)	Cohen	Cohen	Cohen
i. All Other Cichlids (4)	Kulek	Pitts	Pitts
BEST CICHLID - MCKAY			

	<u>First</u>	<u>Second</u>	<u>Third</u>
IV. <u>Marine Fish and Invertebrates</u> (6)	Muller	Bell	Bell
V. <u>Family of Fishes</u> (4)	Bennett	Bennett	Hoffman/Bennett
VI. <u>Plants</u> (3)	Hoffman	O'Bannon	O'Bannon
VII. <u>Set Tanks</u>	No entries		
VIII. <u>Dealer Tanks</u> (1)	Aquaria International		
IX. <u>Photography</u>	No entries		
X. <u>Arts & Crafts</u> (1)	O'Bannon		

Thanks to all who entered!
Congratulations to all the winners!

THE MANUAL OF FISH HEALTH by Dr. Chris Andrews, Adrian Exell and
Dr. Neville Carrington.

Book Review by John Mangan, PVAS

I've recently come across this fairly new (copyright 1988) book from Tetra Press and believe it to be the best aquarium related book that I've seen in quite some time.

It is the first fish disease book I've seen (and I have quite a few) that is actually useful to the average hobbyist. The others all seem to think that everyone has a PhD. in fish pathology, or are so basic as to be useless.

Calling this a "fish disease" book is not really the proper way to describe it. It is, as the title claims, a "fish health" book. As much emphasis is put on how to keep your fish healthy as there is on what to do when they do get sick.

The book is about 208 pages and is divided into 7 chapters. The first- "The Balance of Health", discusses "the relationship between fish, their environment and the pathogens that potentially threaten their health and survival." It covers topics such as the relationship of fish, and their pathogens, to their environment and the relation of stress to fish health. The section on stress is particularly interesting as it explains the physiological changes that occur in a fish as a result of stress as well as explaining what causes stress to your fish.

Chapter 2, "Living in Water", looks at "how fishes are adapted to live in water and how they relate to their environment." This chapter gives a good basic introduction to fishes anatomy and physiology. It discusses fishes senses- sight, sound and pressure, orientation, smell and taste, electroreception, coordination and control. It also goes into basic nutrition and metabolism, osmoregulation, respiration, reproduction, and the immune system.

Chapter 3 is "Understanding Water Chemistry". This chapter covers such topics as pH, temperature, hardness, salinity, CO₂, Oxygen, Ammonia, Nitrite and Nitrate, Chlorine and chloramine, various toxins and more. All of these are explained in a very clear understandable manner in the text and also with many illustrations. This chapter takes what can be a very complex subject and brings it into the grasp of the average aquarist.

Chapter 4, "planning for Health", explains how to provide proper aquarium conditions to keep your fish healthy. It covers such topics as stocking levels, compatibility, decor, filtration, introducing new fish, etc.

In chapter 5 the emphasis changes from how to keep your fish healthy to what to do if they do get sick. Specifically, this chapter helps in "Recognizing Ill-health". The chapter starts with a section of text on diagnosing diseases then moves into one of the unique features of this book a series of diagnostic "charts". Each of these covers a specific area such as "skin and fins". These are not illustrated with the poor drawings that could be showing anything that we are used to seeing. They consist of a series of very clear photographs each illustrating a specific disease that affects the topic of the chart.

This chapter should be very useful to the novice with little experience in diagnosing fish diseases.

Chapter 6, "An A-Z of Common Pests and Diseases". Each disease or pest is given a spread of at least two pages, well illustrated with good, clear photographs of affected fishes and also many other illustrations showing pathogens life-cycles and in many cases sidebars with additional related information such as "what is a parasite", "hygiene and handling", etc. Each pathogens text is broken down into the subheadings: "caused by", "obvious symptoms", "occurrence of the disease", which tells you how and/or why your fish got this particular disease, and "treatment and control". This chapter covers just about every disease and parasite that the aquarist is likely to come across, and does it in language that anyone can understand.

The final chapter, chapter 7, is "A Guide to Treatment". This chapter goes into such things as the chemicals and drugs used to treat fish diseases, calculating dosages, disinfectants, ozone, UV, conditioning, and more.

In conclusion, this is a book that every aquarist should own. It can be used by and helpful to everyone from the complete novice to the advanced aquarist. It takes complex topics and discusses them simply (but completely) in language you don't have to have a PhD. to understand. It is also very well designed graphically with sharp, clear photographs, plus many other usefull graphics. The book is pleasing to the eye as well as usefull. I cannot reccomend this book highly enough. Its authors are to be congragulated on a job very well done.

Report from the Program Committee

Our gratitude is extended to the PVAS membership for their response to our pleas for participation in programs. The future of PVAS is bright only if members actively participate in our functions, and what better way to participate than during wide-ranging and informal discussions structured around a carefully prepared program.

The following individuals have consented to present us with programs during the coming months:

Larry Wilke (April) - topic not established at press time
Jerry Hoffman (May) - techniques for breeding "old standbys"
Barry Farmer (June) - catfish
Russel Hammond (July) - fish genetics and/or photography
Ken Muller (August) - bettas
John Mangan (September) - livebearers
Pete Thrift (October) - discus

We still have November in this year available for the next volunteer. It is suggested that interested parties talk with either Larry Wilke or Tony Fitz as soon as possible. Those applicants who can't be squeezed into 1989 will receive TOP PRIORITY in 1990!

We emphasize that program volunteers will not be left to twist slowly in the wind without support. We have many individuals in PVAS with knowledge of photography, visual aid preparation, and other skills that will be useful for the preparation of any program. Just call on us for information.

Of course it is suggested that volunteers strive to reserve program time as quickly as possible, while space is available. In the absence of such volunteers, we have waiting in the wings the following programs for the membership:

1. The excitement of watching aquarium grass grow
2. The awesome financial opportunities of marketing killifishes
3. Summer field trips to harvest wild tubifex worms and mosquito larvae
(attendance mandatory)
4. Aquarium teardown just for the fun of it
5. Secrets of propagating duckweed
6. Bridges of Brazil
7. Another program from Tony or Larry

Thanks again to you members who have chosen to become more actively involved in PVAS, through participation in the programs. Through your efforts, we will make this year the best in our hobby, and build a foundation for even better years in the future!

Larry Wilke and Tony Fitz
Program Committee Co-Chairmen

MY EXPERIENCES WITH THE BROWN DISCUS - SYMPHYSODON AEUQIFASCIATA
Pete Thrift, PVAS

This article is solely to share my experiences and techniques working with the brown discus - by no means am I proclaiming myself as any expert on these magnificent fish. All I have done is to develop my own maintenance program which has resulted in two of my fish feeling comfortable enough to act on their reproductive urges. Hopefully some of the information in this article may be of benefit to other aquarists working with discus, but my methods are definitely not the only way to success.

Almost three years ago, I purchased my first discus after having admired them from the time I entered the hobby. It took nearly a year and a considerable amount of money to reach the point where I had some confidence in my ability to keep discus alive and healthy. In the spring of 1987, I purchased ten juvenile brown discus, each about the size of a 50¢ coin, in the faint hope of eventually obtaining at least one pair. The fish were initially placed in a bare ten gallon tank with a Tetra sponge filter, where they prospered on a diet of beef heart, bloodworms, and commercial dry foods. The basic item in the diet of my fish is frozen beef heart, which I order from a local supermarket and grind myself. Preparing the heart myself keeps the cost very low, and I am feeding food fit for human consumption. The primary commercial food I have come to rely on is Hikari Lionhead pellets. Although marketed for goldfish, the Hikari formulation is well-suited to carnivorous fish as well. It is a sinking pellet which all of my fish will eat with little or no coaxing.

I believe very frequent water changes are needed when feeding beef heart. I try to perform a 20-25% water change on each tank twice a week, using a gravel washer to clean the substrate. I use SeaChem Neutral Regulator and Discus Buffer to condition the water to a pH of about 6.8 and a hardness of around 5 DH. Tank temperatures are kept at 82 degrees. Excepting when very small, all my discus are housed in tanks with gravel and plastic plants. Most of my tanks are filtered by large, air-driven Tetra sponge filters. My fish do not like strong water movement in their tanks, so these filters are ideal.

The juvenile discus grew at a steady pace, and reached over five inches in diameter after a year. About this time, two fish began to show interest in each other by swimming together, minor arguments and fighting, and even some lip-locking. Finally in March of 1988 the two deposited about a hundred eggs on the front glass of their tank. This event caused a great deal of excitement in my household, which quickly subsided when the eggs turned white 36 hours later and were eaten. This activity was repeated several times until I moved the two fish (I wasn't sure I had a pair yet) to their own 29 gallon tank. This tank was set up with Tetra filters, gravel, some plastic vallisneria, and a piece of slate as a spawning site. The fish looked great, but ignored each other for next two months.

Finally, in June of 1988, the pair deposited eggs on the slate. When two days had past without the eggs fungusing or being eaten, I allowed myself a little ray of hope that I did have a pair rather than two females. The next morning I thought the parents had eaten the eggs again when the slate was bare, but the parents had moved the newly hatched wrigglers (wow!) to a small pit in the gravel in a rear corner of the tank. These fish had now taken me further in the discus spawning experience than I had ever expected to reach, so I just kept my fingers crossed and waited.

Two days later, I came home from work to notice that the parents were at mid-water in the center of tank. Turning on the tank light revealed two absolutely stunning fish with about 75 comma-sized fry swarming all over their sides! Without a doubt, this has to be the most memorable thing that has ever happened to me in the hobby! My whole family would repeatedly pull up chairs and watch this fascinating sight.

For the first week, the fry took all their nourishment from their parents' sides, and seemed to double in size each day. At day six, I began to offer live baby brine shrimp to the fry, who accepted the new food if they didn't have to stray too far from the parents. Each succeeding day the fry became more independent of the parents, so more of the brine shrimp were being taken.

It was about day eight that things began to take a turn for the worse, and I began to lose one or more fry each day. The affected fry would swim into corners as if lost or disoriented, hang near the surface, and would die within 24 hours. After a week of losses, I decided to remove the fry, now down to about 50, from the parents. I placed them in a bare ten gallon tank filled with water from the parents' tank to minimize shock, but overnight I lost ten more babies. I was very reluctant to medicate fry so young, and just tried to keep the water quality as high as I could. Unaffected fry continued to eat all the baby brine I would feed them, and grew accordingly. But the losses continued, and at three weeks I was down to about two dozen fry. Since I could see no external clues as to the problem but continued to siphon one or two tiny corpses out of the tank each day, I finally decided to try a metronidazole-based antiparasitic. This drug seemed to slow the problem down, but did not cure it. At day sixty, I was down to eight fish. Only one fish from that spawn has survived to the present.

The parents spawned again in September, and the fry made it to the free-swimming stage, but never went to the parents' sides. They scattered all over the tank, despite the parents' frantic work to keep them together, and they starved to death in a few days. This mass disorientation has been described in some discus articles, but that didn't make me feel any better.

In October, the parents again spawned. Frankly, I wasn't sure I wanted to go through all the trouble and heartache again. However, this time the fry found their parents and all went well for another week, when again I began to lose fry! I had talked to Jack Wattlely about this problem at the PVAS fall workshop, and he had advised leaving the fry with their parents longer and raising the tank temperature. This I did, and the losses weren't as bad as before, but still I lost fish. However, leaving the fry with the parents for over a month resulted in greatly increased growth rates. At about six weeks, the parents were showing signs of disinterest in their offspring and interest in spawning again. So I decided not to push my luck any further and netted the remaining three dozen fry and placed them into a bare five gallon tank. The fry loss rate began to rise after this point, and I was determined not to have a repeat of the earlier baby massacre, so I raised the tank temperature to 92 degrees and added a wide-range medication containing the following drugs: malachite green, trichlorofon, sulfa, and nitrofurazone. This stopped the loss of fry literally overnight. The problem with using a wide-range treatment is not being able to tell which drug caused the cure. Since the parents never showed any signs of poor health, I ruled out bacterial causes. Instead, I assume that the problem was external parasites, and the malachite green and/or the trichlorofon was the solution. I raised nineteen fry from this spawn.

While the first two successful spawnings were both tremendously exciting, the third spawning was the most amusing. In early December, I rearranged the few tanks in my basement, and placed the parents in a 50 gallon tank temporarily with several other adult discus. I was surprised two weeks later to discover they had again spawned, this time on the tank's rear glass. Figuring this spawn was bound to be eaten by somebody in the tank, I wrote it off. I was very surprised several days later to find a group of wrigglers in the top of one of the taller plastic plants. This spawn successfully went to the parents' sides, and it was at this point that things became comical. The parents did not stake out territory within the tank, but swam throughout the tank with the babies at their sides. However, they would not let any other fish come within six inches of the fry. All intruders were forcefully driven off. After several days of this, the other fish learned a lesson. If another discus inadvertently found itself within the six-inch limit, it quickly turned on its side and clamped its fins until it was again outside the limit. This action (signaling submission? playing dead??) would prevent an attack from one or both parents. As the fry grew bolder and ranged further from the parents, the other discus had problems as this invisible six-inch-line was now mobile. They spent a great deal of time hovering on their sides, often packed into one tank corner. I'm sure I heard a collective "whew!" from the tank when I removed the fry after three weeks on the parents' sides. I raised about thirty fry from that spawn.

This article has become much longer than I had intended, so let me close with a few other general comments and observations:

- every spawning occurred after a water change, and always in the evening.
- the parents would at times secrete so much body slime that the tank glass appeared to be fogged and the sponge filters would clog.
- the longer the fry were left with their parents, the better their growth and vigor was.
- I have not had a fertile spawn in a tank with a power filter - too much water movement for the male to fertilize the eggs is my guess.
- each successful spawning has been separated by at least one or more unsuccessful attempts. By no means have my fish or their keeper gotten this "down pat" yet.

Finally, recent discus articles and books seem to be dismissing the brown discus and concentrating only on the turquoise discus. While the various discus "color" strains are indeed beautiful fish, they often contribute to the discus stereotype by being skittish and more susceptible to parasites and disease. The "ordinary" brown discus, perhaps because it has not been so inbred and is closer to its wild ancestors, is often a stronger and more accommodating aquarium resident. My Wattley turquoise discus spend much of their time hiding in the plants, while my brown discus all come to the front of their tanks to greet me whenever I approach. Do I need to say which are my personal favorites?

Review of the Meridian Automatic Water Changer

Tony A. Fitz, PVAS

For many aquarists, water changes are an unpleasant chore. Changing aquarium water is a lot like washing dishes; no matter how well or often you do it, the job soon needs to be repeated, and the job is not particularly fun. Using the standard rule of thumb of 5-10 % of the aquarium volume changed weekly, it is readily calculated that significant amounts of water are transported. For example, if a single 55 gallon tank receives regular 10 % weekly water changes by manually transporting new and used water in a bucket, then in ten years more than TWENTY TONS of water will hauled to and from the aquarium. My back hurts at the thought.

When I was younger, water changes didn't bother me too much, but with time I have become more and more reluctant to lug around water containers. Additionally, finding space in my cramped quarters for aging water has always been a problem. Consequently, I have long been interested in ways to simplify and automate water changes.

My first attempts to simplify water changes utilized a long piece of clear plastic tubing to siphon tank water directly into a drain, and a garden hose connected to a faucet to replace water, operated at a very low rate of flow. This system had problems: (a) the drain hose had to be propped into position at either end and watched carefully for problems such as dislodging by a housefold inhabitant, (b) unfortunate creatures would get caught by the drain hose, and a corydoras wedged 15 feet down a thirty foot hose is in big trouble, (c) I would forget what was going on or get distracted, resulting more than once in tanks that got COMPLETELY emptied, (d) in winter, cold tap water would sometimes contain such volumes of dissolved gas that it had lethal effects even when the chlorine was inactivated and the temperature adjusted. A better system was needed.

To improve my regimen of water changes, I began using a Meridian water changer about four years ago. This report is submitted to review its operation and critique its performance. The Meridian device has proven to be better for me than manually hauling water, although it has its problems.

The Meridian water changer has two parallel twenty foot long flexible tubes that connect the aquarium and a faucet/drain combination. At the aquarium end, a manifold attaches to the aquarium containing a pin hole for tap water entry, and a screen-covered port for aquarium water exit. At the faucet end, one tube attaches to the tap water supply, and the other goes to a drain. Tap water will pass through the pin hole at a speed controlled by a needle valve, resulting in a thin stream of water into the aquarium. The incoming tap water creates a suction that pulls outgoing water out of the aquarium, resulting in a positive

draining force which enables "uphill" water drainage.

The Meridian water changer is simply constructed, portable and easy to operate. The inlet hose is attached to a faucet, the outlet is positioned in a drain, the manifold end is hooked onto the aquarium, then the tap is turned on. When the device is operated at maximum speed, approximately 5 gallons per hour of water is exchanged.

More than one Meridian changer can be operated simultaneously. After several years of using one device, I added a second unit, using a Y-splitter from the tap. Meridian claims that multiple units can be installed in tandem for use in almost any size of operation.

The Meridian company makes several dubious claims for their water changer. One claim is that the jet of tap water comes in at such pressure that dissolved chlorine and gasses are released without effect upon fishes. I learned at the cost of a tankful of young Gold Australes that this claim was unjustified. In my experience, it is important to neutralize the chlorine in incoming tap water using one drop per incoming gallon of saturated sodium thiosulfate added directly to the tank at the beginning of changer operation. Another claim by Meridian is that the hose length can be extended by 20 feet, enabling a forty foot separation of sink and aquarium. I am fortunate that the standard 20 feet of tubing with the Meridian changer will connect all of my aquaria to a sink. For those having a longer distance between aquaria and sink, Tom Hetzel informs me that extending the hose length by an additional 20 feet doesn't maintain proper Meridian operation but is a great way to water your floor.

The Meridian device should not be trusted at a low rate of flow, especially if the aquarium water has to travel uphill to a sink. Under such conditions, water efflux does not equal water influx, and the net result is water on the floor.

The manufacturing quality of the Meridian changers are not impressive, in my experience. Of the three units used by me, one unit was defective at purchase, having the disconcerting insistence of tank filling at a faster rate than tank drainage. A replacement unit had a defective pin-hole resulting in a spray instead of a stream. This problem was alleviated but not completely repaired by reaming out the hole with a needle. A third unit gradually developed a defect in junction of its plastic facing surfaces in the manifold, resulting in air leakage and an impaired drainage rate. However, the defect was in a location that enabled its repair using a plastic solvent.

If the reader is following my litany of problems closely, it becomes apparent that most problems involving the Meridian water changer seem to be manifested by the appearance of water on the floor. This has been my experience, although I might emphasize that my changers have produced many hundreds of hours of trouble-

free operation. It is just that the few times of trouble are easily remembered.

The Meridian device is reasonably priced, at about \$20 through the mail-order firm that I favor. I suppose that it would cost an additional \$5-10 if purchased through a local retailer, and the extra expenditure might be worthwhile to gain dealer support in case of defective equipment.

The Meridian water changer can be a useful device. Its proper use makes water changes an easier chore, and it has saved me many hours of labor. It is simple to install and operate. It should be used only with the operator in attendance, unless water on the floor is inconsequential.

I don't have experience with other automated water changing devices, although others exist. Can anybody else provide first hand information about other types of automated water changers?

PVAS BOARD MEETING - APRIL 3, 1989

President Pete Thrift hosted the meeting, convening at 7:30 pm. Also present were Kenny Warren, Lea Spickler, John Stieringer, Bob Pallansch, Barrie and Ray Farmer, and Gene Aldridge.

Announcements:

PVAS has purchased the Aquatic Maestro video tapes; they will be available to members for \$1.00 each per month with \$5.00 deposit.

The May DeIta Tale will be put together by Gene and Pete; unless an editor is found, it will be the last issue.

The amendments to PVAS by-laws are completed and approved; they will go to Richmond for non-profit status application.

Membership cards will be issued beginning in June.

The May meeting will not include a bowl show.

Spring Show:

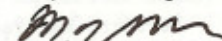
Five ten-gallon tanks, plus manufacturers' donations will suffice for the 3/\$1 raffle; the 55 set-up and all show/auction supplies and forms are on hand or available, so the May Board meeting may be canceled or truncated.

License and Bonding fees may scuttle PVAS' ability to sell drinks or snacks at the show; unless it proves feasible, we will not sell food. Set-up will begin at 6:00 am, May 6 (sec. note: larks arise!).

Dealer tanks will be judged last to allow set-up time.

The meeting adjourned at 8:30.

Respectfully submitted,



Robert J. Pallansch
Recording Secretary

INDUSTRY SUPPORTERS OF PVAS

The following companies generously made product donations to PVAS to use as prizes either at our monthly meetings or as raffle prizes at our spring and fall auctions:

Aquarium Fish Magazine
Aquarium Pharmaceuticals, Inc.
Eugene G. Danner Manufacturing, Inc. (Supreme)
Finny Products Company
Freshwater and Marine Aquarium Magazine
Fritz Aquaculture Products
Ginger Products Company
Rolf C. Hagen (USA) Corp.
Hawaiian Marine Imports
Hikari Sales USA
Jungle Laboratories
Mardel Laboratories
Marineland Aquarium Products
Penn-Plax Plastics, Inc.
Perfecto Manufacturing Company
San Francisco Bay Brand, Inc.
Tetra USA
TFH Publications, Inc.
Wardleys
White Shark Corporation
Willinger Brothers, Inc.

Many of these firms have been supporting our society for many years. Their donations generate significant income for our activities. They all deserve our support in return.

CICHLID EXPERTS TO SHARE THEIR KNOWLEDGE

American Cichlid Assn.
(Released May 1989)

The International Cichlid Conference, to be held in Orlando, Florida this summer from August 10 through 13, is going to feature Cichlid experts from all over the world, sharing their special knowledge with Cichlid enthusiasts attending. Speakers include:

Rainer Stawikowski - "An Aquarists View of South African Cichlids"
Current editor of DATZ, Germany's largest aquarium magazine, he is also the editor of D.C.G. Information, the Journal of Dutche Cichliden Gesselschazft. He specializes in Cichlids from Central and South American and has collected in South America. His presentation will cover his travels and the maintaining of South American Cichlids, with special emphasis on the Geophagus group.

Dr. Guenther Ritter - "A Comparison Between the Aquarium Hobby in the United States and Germany"
He heads the Chemical Research and Development for TetraWerke in West Germany. He has been responsible for the development of water treatments, food, medication, fertilizer and popular pond items. He has worked with African cichlids, killifish, and marine fish and is one of the leading authorities on aquarium technology. He will provide many insights into both U.S. and European approaches to healthy and successful aquaria.

Dr. Anthony Ribbink - "Evolution of Parental Tactics in Lake Malawi Cichlids"
Deputy Director of the J.L.B. Smith Institute of Ichthyology in Grahamstown, South Africa, Tony is additionally a recognized authority on Malawi Cichlids. He has countless hours of underwater observation in Lake Malawi, as well as lab work to his credit. This was the basis for his book on the fishes of Lake Malawi.

Marshall Meyers - "Regulatory Threats to the Aquarium Hobby"
Executive Vice-President and General Counsel of the Pet Industry Joint Advisory Counsel (PIJAC), an organization that monitors legislation concerning pet animals on the local, state, federal and international levels. His presentation will address current regulatory efforts that may restrict or limit the importing, breeding, distribution and ownership of aquarium fish.

John Farrell Kuhns - "Aquarium Water Chemistry"
He has been a hobbyist since the age of 5, is an excellent speaker, a fun person, a regular contributor to the Fish Forum on CompuServe and a chemist ... which should qualify him as an authority on water chemistry for cichlid tanks. That he was the developer of such products as Novaqua and Amquell clinches it.

Dr. Ad Konigs - "The Amazing Cichlids of Lake Tanganyika"
The publication of Tanganyika Cichlids the "hottest" book in the European and American fish hobby, has made him one of the most respected cichlid experts. From his beginning days as an aquarist in Holland to his current position as a professor at the University of Heidelberg, he has been keeping and breeding cichlids, especially Tanganyikans. He has made several trips there and to Lake Malawi. He is a regular contributor to many Aquarium Magazines.

Dr. George Klontz - "Cichlids as Food"

He has been studying fish aquaculture and diseases for over 30 years. Currently professor at the University of Idaho, where he has taught courses in fish culture, diseases, physiology and pathology, he has traveled to many parts of the world to study and consult on various aspects of aquaculture. His talk will inform as well as entertain you on a subject that many aquarists have trouble swallowing. Fun!

Dr. John B. Gratzek - "Angelfish Disease"

Professor and Head of Department of Medical Microbiology in the School of Veterinary Medicine, University of Georgia. A well know fish disease expert. Has traveled extensively and visited fish production centers in Australia, Asia and South America. His research has covered many aspects of the aquarium hobby including filtration, drug therapy, UV and ozone use, and fish shipping. He is currently working on angelfish disease and will discuss the status of his research with us.

Dr. David Ford - "Cichlid and Other Fish Nutrition"

An avid hobbyist for over 40 years and a Chemist and Food Scientist, he has what he thinks is the best of both worlds. His hobby and profession have become one. He has developed fish foods for the popular market in both Europe and the U.S. He has studied tropical fish keeping in both Europe and Asia. He has authored several books and many articles in England and U.S. aquarium magazines. He is a delightful speaker and person.

Dr. Ruth Francis-Floyd - "Angelfish Disease"

Assistant Professor, College of Veterinary Medicine, University of Florida. Holds a joint appointment with the Department of Fisheries and Aquaculture. Extension Veterinarian for fish farmers in Florida. Has done research on marine turtles, manatee reproduction and diseases of channel catfish.

Heiko Bleher - "Collecting Fishes on Five Continents"

He has made over 350 expeditions over the last 37 years to over 30 countries, resulting in the introduction of many new fishes to the hobby. His articles and books reach aquarists around the world. He will take us on a whirlwind tour of his travels and collecting trips in remote and sometimes dangerous locales.

Last minute update - Heiko will give a second presentation on some new cichlid genera from several previously uncollected lakes in Central Africa.

George Barlow - he will take the place of a speaker who had to cancel, speaking on Central American cichlids. He is from the University of California at Berkley.

There may be additional speakers by the time of the Conference. Certainly there will be quantities of interesting people to talk to, manufacturers and special interest exhibits -- not to mention Orlando's fantastic offering of family fun features.

This is truly one Cichlid Conference you don't want to miss. Make your reservations with Orlando Hyatt today. Talk to Delta Airlines about special fares. Get a rent-a-car through Budget. Mention the A.C.A. to get special rates from all of them.

American Cichlid Association, Inc.
International Cichlid Conference
To Be Held August 11-13, 1989
At the Orlando Hyatt, Orlando, Florida

REGISTRATION BLANK

Name (s): _____

Address: _____

City/State: _____ Zip: _____

	Dollar Amount
ICC Registration* (\$32.00 each) (Includes admission to all speaker presentations, exhibits, trade show, hospitality room, auction)	\$ _____
Fish Farm Tour, Aug. 11 (inc. lunch, space limited) (\$22 ea) (ICC registration is required for Fish Farm Tour)	_____
ICC Banquet - August 12 (\$25 each) Circle Entree Desired: Beef Fish Chicken	_____
Day at Sea World - August 9 (\$14 each)	_____
Round Trip Bus Ticket if needed (\$6 each)	_____
Special Sea World Photography Contest (\$10 each) (Inc. 36-exp. roll w/overnight processing)	_____
Fish Show Entry Fee (\$2/entry)	_____
Photography/Art Show Entry Fee (\$2/entry)	_____
Special A.C.A. Membership Offer (\$7.50 for 1 year)	_____
Total:	_____

Charge Card Information if you wish to pay in that manner:

(Circle Card) Visa MasterCard AmerEx Card # _____

Expiration Date: _____

(Be sure name at top of page is name on charge card)

MAIL THIS REGISTRATION WITH PAYMENT TO: ICC
4926 Hidden Oaks Trail
Sarasota, FL 34232

Make hotel, plane and rental car reservations directly with offering
company!

Number of Auction holding tanks needed: _____

What causes the the sea anemone to sting?

Tony A. Fitz, PVAS

Sea anemones are popular residents in salt-water aquaria. Having vivid colors and possessing graceful, undulating movements, the anemone provides a pleasing display as well as an interesting lifestyle.

The stimulus causing the sea anemone to sting is poorly understood. Aquarists know that appropriate prey are quickly stunned by the anemone, yet others such as the clownfish appear oblivious to the dangers of anemone stings. Does the clownfish possess special defenses against the anemone sting, or does the anemone somehow know not to sting the visitor who is inappropriate for an anemone meal?

The 24 March 89 issue of Science provides a description of the mechanisms causing the anemone to sting, based on very recent studies. It appears that two events stimulate the explosive expulsion of the "cnidocytes", which are the stinging cells. First, specialized receptors sense movements at certain frequencies. Additionally, other receptors sense the presence of certain sugars and mucous. In short, a visitor that moves like a meal, and tastes like a meal, very likely will become a meal!

TRADING POST

- FOR SALE: - Several adult brown discus - \$15-\$18
- Brown discus fry, \$6-\$7
- Whisper 800 air pump, new cond, purchased as backup - \$16
- Tetra Luft G air pump, excellent cond - \$10
- Brand new 4 ft, 40 watt AquaGlo tube - \$6
- Complete set FAMA 1987 - \$20

Pete Thrift 971-0594

BRISTLE NOSE PLECIOSOMUS

By Eugene T. Aldridge, Jr.

This article is from the October 1975 issue of DELTA TALE.

The Bristle Nose Plecostomus is one of about 200 species of plecostomus catfish divided up into five or six families. The plecostomus is a sucker-mouth catfish primarily coming from the Amazon River Basin and grow in size from a couple of inches to several feet. These catfish come in all shapes and sizes, and with or without bristles. I think one of the big problems we face as hobbyists trying to breed these fish is taking a premise pertaining to one species and applying it to many, such as, in the case of the bristle noses "the male bristles are branched while the females are not". When applied to this particular species of bristle nose, the male has singular spiked and Y shaped bristles and the female has none or very few spikes. I have looked through all the books I have and can not tell what genus or species that I am breeding. Any assistance will be gratefully accepted. I will continue to look. (Author's March 1989 Note: This plecostomus has been determined to be *Ancistrus cirrhosus*.) The spawning of difficult fish the first time is generally just pure luck, but to learn enough during the process to do it again is something else. However, the real test that separates the greenhorns is the home spawning of the second and third generations.

The spawning and raising of the particular kind of Bristle Nose Plecostomus that I have is really quite easy, if you have a pair and a relatively quiet place to put them. I currently have babies ranging up to 4 cm in size. As of early September 1975, my pair have spawned 7 or 8 times, that I know of, since Easter; under all sorts of conditions. I have raised babies from two spawns and will try to relate my experiences. The story begins in September and October of last year, when "Oceans" was having a sale on small 4 to 5 cm plecostomus at \$0.99 a piece. I was buying them to put in various of my "Rift Lake tanks" as previous experiences showed that once over the initial water conversion shock they did quite well, I might lose one in 4 or 5. Over the next six months these baby plecostomus grew to the respectable size of 8 to 10 cm.

As an Easter present to my fish, I cleaned and changed water in all my tanks, and while draining water from my 50 gallon tank, I noticed 5 baby plecostomus about 10 mm long. I know now I should have pulled them out, because a few days later they were gone. The only logical answer is that the big water change was to much. About two weeks later, I started to tear down the tank so the plecostomus could be moved to a tank by themselves, but in a rock cave in the middle of the tank there was the male guarding, in a very nervous manner, a large mass of about 100 eggs. These were

about 3 mm in diameter and orange in color. All the other tank inhabitants knew what was going on and were continually darting in and out. Three days later all the eggs were gone. This tank is a typical "Rift Lake tank" with a pH of 7.4 to 7.8 and a hardness 200 to 280 ppm. Currently the water has a pH of 6.6 and hardness of 196. From this, you can see, these fish will spawn in most any type of water. Two weeks later I moved the pair to a 20 gallon long tank with white gravel, clay pots, plastic piping and eight *Libidochromis fryeri* about 2 to 3 cm long. On the 3rd of May, when doing another water change, I noticed several baby catfish. A more thorough examination turned up nine baby plecostomus. At this point I felt that most of the small ones were being eaten by the *L. fryeri*, so I moved them, leaving the plecostomus to themselves.

Over the week-end of 17 May, they breed again. I looked for the eggs after seeing that the female had lost a lot of girth and was slightly beat-up. After our show, I found the eggs up inside the top of a pottery mushroom. The male takes care of the eggs by fanning and picking dirt off of them. The female does not stay around. The eggs were the same as previously described. The male gets quite agitated when anyone comes close but not real aggressive.

The bristles on the nose of the male form an inverted Y. The two top ends of the Y start at the eyes and end up at the tip of the nose. These bristles are roughly 10 mm in length, with real short ones of about 2 to 3 mm in length around the edge of the mouth. The nose of the female is almost completely bare with maybe a few singular spikes.

About three days after the eggs are laid, several small 8 mm fish, with egg sacks attached, were on various parts of the tank glass. The inside top of the mushroom was covered with babies. Forty-eight hour later, they could not be found, therefore, I resigned myself to the fact that they had been eaten. A few days later, I was surprised to see 15 to 20 babies running around the tank, the next day the whole tank was covered with babies. A month later, there were about 75 babies about 15 to 20 mm in length. There is a great divergence in size.

A month later they breed again, however, the male offered no defense of the eggs so they were eaten by the babies. I have no other empty tanks, so the babies and parents can be separated. In early September, the 10th to be exact, I found a large bunch of eggs, resting on the sand right at the glass, I said to myself, "What the heck, why not try to raise the babies artificially". So I put them in a specimen jar with an airstone, sometime Friday the eggs hatched. Saturday morning the water was awfully milky. I drained it and replaced the water with tank water. That evening, I discovered a stupid thing, I forgot to put the

airstone back into the specimen jar, however. I still have six or seven swimming all over the place in a fine mesh net hanging in the big tank. I will just see how far I can get with them. This could be the way to raise baby plecostomus by the carload. As of the 17th, they are free swimming and beginning to look like plecostomus.

Author's Note: Based on my experiences outlined about and using both natural and artificially methods of raising babies, I raised carloads of babies and supported my hobby for a number of years with the money raised.

BAP BOARD MEMBERS

John Jessup (Chair-Manassas) 703-330-6257
Gerry Hoffman (Warrenton) 703-347-7486
John Mangan (Vienna) 703-938-4778
Gene Aldridge (Arlington) 703-998-8757
Pete Thrift (ex-off-Franconia) 703-971-0594

CHECKERS

Arlington County: Gene Aldridge-998-8757
Fairfax-Vienna: Jim Long-280-1753
Clifton-Centerville: Kenny Warren-378-8838
Warrenton: Gerry Hoffman-347-7486
Montgomery County: Tony Fitz-340-7876
Montgomery County: Ray Hughes-424-3531

A Community Spawning Method
by Ken Muller

The spawning of bettas in my fish room has taken on a new approach in the past few months. I still use bare bottom tanks and cut styrofoam cups lengthwise but I now add java moss to the tank. I start with a ten or five gallon tank, a 50 watt submersible heater adjusted to 80 degrees and the best male and female I have available. I place the male in the tank and float the female in a quart size mason jar. Once a bubble nest is built or three days have past, I release the female. The java moss gives the female a place of retreat until she is ready. Once the eggs are released and in the nest, the fun begins.

My first attempt in using this method came with *Betta imbellis*. Instead of removing the female I just feed the tank as usual waiting for the fry to hatch. When the fry are free swimming I feed microworms along with brine shrimp or other foods for the adults. I also turn on a small sponge filter just enough to circulate the water. After a four days of feeding microworms, I start to decrease the quantity of microworms and add newly hatched brine shrimp to the tank along with the foods for the adults. A week after the fry are free swimming I cut off the sponge filter and let the male build a new bubble nest and start the cycle over. The parents are constantly in spawning condition but after two to four spawns, I remove them for a few weeks of rest.

Now that I told you some of the good news, let me relay the problems I have had using this method. During the times when the sponge filter is cut off, the chance of losing the whole tank of fry and the parents is greatly increased because of over population and the risk of pollution from overfeeding. I had to learn the hard way by having about 300 *imbellis* fry and the parents die in a five gallon tank. I now scoop out the large fry and place them in a ten gallon tank with good filtration for several months before they are ready to pick up where their parents left off. My adaptations of this method to *splendens* has brought about some pleasant surprises. You say your male keeps eating the eggs once you remove the female. Well try this method for just a single spawn and then remove both parents after the fry are free swimming. I have found that by having the female in the tank, the male is kept occupied and thus tends the nest the way we all dream they should. One other side effect I am just beginning to notice is the young from spawns of this method make extremely good parents and breed without shredding every fin in sight. I hope this will help those that have tried just about everything but just can't get fry from their prized bettas.

PVAS Summer Meeting Dates

12 June

10 July

14 August

Come Join Us!

VIRGINIA

PETS-N-THINGS

PAN AMERICAN CENTER
3081 Nutley
Fairfax, VA 22031
573-4400

TYAU TROPI-CARE

6905 Duke Drive
Alexandria, VA 22307
765-6713

ANNANDALE PET SHOP

7406 Little River Turnpike
Annandale, VA 22003

AQUARIA INTERNATIONAL

1180 Pendleton Street
Alexandria, VA 22314
683-4811

BAILEY'S PET CENTER

LEESBURG PIKE PLAZA
35217 South Jefferson Street
Bailey's Crossroads
Falls Church, VA 22041
931-1400

BEACON MALL PET CENTER

BEACON MALL CENTER
6776 Richmond Highway
Alexandria, VA 22306
660-6100

DISCOUNT PET CENTER

MANASSAS SHOPPING CENTER
9028 Mathis Avenue
Manassas, VA 22110
361-7769

NATIONAL PET AND AQUARIUM

WILLSTON SHOPPING CENTER
6168 Arlington Blvd.
Falls Church, VA 22046
533-7828

OAKTON PET SHOP

OAKTON CENTER
Rt 123 and Hunter Mill Road
Oakton, VA 22124
281-9622

PET MART - TYSONS

8417 Old Courthouse Road
Vienna, VA 22180
281-8181

WILSON'S PARROTS & MARINE L

SHIRLEY EDSALL INDUSTRIAL PARK
Build America 5
5605-G Gen Washington Drive
Alexandria, VA 22312
922-7358

SUNSHINE PETS

7395-H Lee Highway
Falls Church, VA 22042
573-6946

PETS, ETC. - HERNDON

STUART CENTER
462 Eiden Street
Herndon, VA 22171
437-0381

PETS, ETC. - STERLING

HECHINGER JAMESWAY PLAZA
243-C Harry Flood Byrd Hwy
Sterling, VA 22170
430-9667

PETS, ETC. - ALEXANDRIA

MT. VERNON PLAZA
7688-B Richmond Highway
Alexandria, VA 22306
768-2200

PETS, ETC. - CHANTILLY

SULLY PLAZA
13932 Lee Jackson Highway
Chantilly, VA 22021
378-2777

MARYLAND

ANIMAL EXCHANGE

765-A Rockville Pike
Rockville
Maryland 20852
301-424-PETS

AQUARIUM CENTER

Randallstown Plaza Center
Liberty Road at Offutt Road
Randallstown
Maryland,
301-521-4529

GLENMONT TROPICALS

Glenmont Shopping Center
12345 Georgia Avenue
Wheaton
Maryland
301-949-0344

PETLAND

White Flint Plaza
5268 Nickolson Lane
Kensington
Maryland 20895
301-231-5216

SHOWCASE AQUARIUM

11248-11250 Triangle Lane
Wheaton
Maryland 20902
301-942-6464

CONGRESSIONAL AQUARIUM

Congressional Plaza
162 Congressional Lane
Rockville, VA 22306
Maryland 20852
301-881-6182

RICK'S FISH AND PET SUPPLY

36 South Market Street
Frederick
Maryland
301-694-9664 or 301-831-6866

FISH FACTORY AQUARIUM

582 NORTH Frederick Avenue
Gaithersburg
Maryland 20877
301-948-1133

PETLAND

Briggs Chaney Plaza
13833 Outlet Drive
Silver Spring
Maryland
301-762-3505

PET MART - ROCKVILLE

2230 Veirs Mill Road
Rockville
Maryland 20851
301-762-3505

TROPICAL LAGOON

9439 Georgia Avenue
Silver Spring
Maryland 20910
301-585-6562

MONTGOMERY TROPICALS

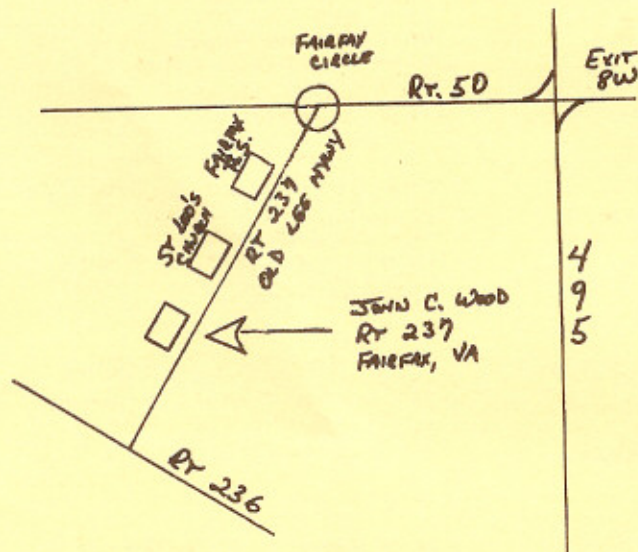
7845-G Airpark Road
Gaithersburg
Maryland 20879
301-670-0886

SUPPORT YOUR LOCAL PET SHOP

THEY HELP SUPPORT US !!!!!

POTOMAC VALLEY AQUARIUM SOCIETY
P.O. BOX 4219, SHIRLINGTON STATION
ARLINGTON, VIRGINIA 22206-0219

BULK RATE
U.S. POSTAGE
PAID
PERMIT NO. 418
ARLINGTON, VA



THE POTOMAC VALLEY AQUARIUM SOCIETY WILL MEET ON THESE 1989 DATES

9 JAN	10 APR	10 JUL	18 OCT
13 FEB	8 MAY	14 AUG	13 NOV
13 MAR	12 JUN	11 SEP	11 DEC

MEETINGS ARE AT THE JOHN C. WOOD FACILITY, RT 237 (OLD LEE HWY),
FAIRFAX CITY, VA. DOORS OPEN AT 7:30, MEETINGS START AT 8:00 PM

EVERYONE IS WELCOME!!!!!!