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FISH AT WORLD'S FAIR

Read Many Informative Hob[illegible]es

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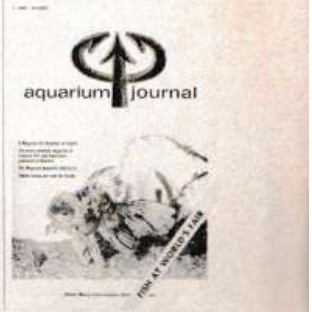
contents

cover photograph

A male Azumanishiki (calico oranda) goldfish, about 3½ years old. His name is "Stony" and he is the most prized specimen of George and Valerie Mitchell, who, incidentally, won first prize in the goldfish class at the recent S.F.A.S. Spring Fish Show. Learn more about keeping of goldfish in the article by the Mitchells on Page 332. Cover photo by Dick Law.



You'll find fishes in several major exhibits at the New York exposition

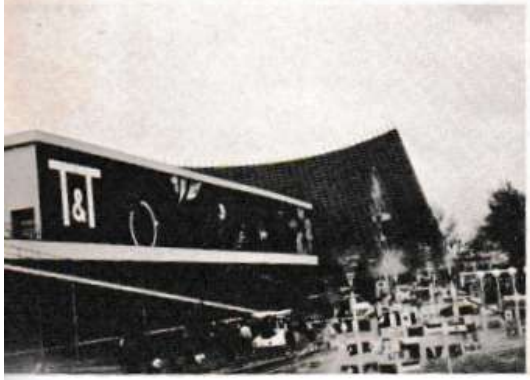
Fishes at the World's Fair

Diane Schofield
Burbank, California

THERE'S A SQUARE MILE in New York that bears the unlikely and rather unpoetical name of Flushing Meadows. This square mile is cluttered with an assortment of buildings that look as if the future has been moved up a few centuries so that it is happening right now. This is the New York World's Fair. The Fair opened on the 22nd of April of 1964 for two years. It's nine times as large as the Seattle Fair of 1962 and somebody figured out that, if we really worked at it five hours a day, one might get through all the exhibits in 30 days.

In his initial "Welcome to the Fair" in the official guidebook, Robert Moses, the president said, "The Fair aims to be universal, to have something for everyone." Everyone includes even aquarists, because in tromping around these fair grounds, it is possible to see fishes and things pertaining to fishes crop up in an amazing number of the exhibits.

In the dramatic reflecting pool that dominates the ground floor of the Eastman Kodak exhibit are exotic goldfish. "Planted" all throughout this pool are huge golden aluminum "just-gone-to-seed dandelions" which match the metallic hue of the giant goldfish with which this pool has been stocked. When tired of looking at fishes, one can go to the roof of this pavilion and go strolling on the "surface of the moon," since it is patterned after the probable topography of the lunar surface.



Scientists are anxious to learn about the depths of the oceans, a place we know little more about than outer space. To help solve some of the deep sea riddles, which naturally involve fishes, the government has developed a two-man submarine on display in the big square, multi-million dollar, blue-green, fiberglass U.S. pavilion. The theme of this pavilion is "Challenge" and the challenge as represented by the exploration of the sea's depths is the "challenge of the population explosion." The two-man submarine's role in this is explained in a placard which reads in part, "The two-man submarine, used to assist fishery studies being conducted by the Department of Interior is a part of the world's relentless search of new knowledge about food resources."

The underwater theme is taken up in yet another pavilion, that of the spectacular General Motors' Futurama, which is housed inside a 110 foot high slanting canopy of what looks to be giant popsickle sticks. As the Fair visitor gets into individual plastic contour seats equipped with speakers, he moves along a route that takes him, among other unlikely spots, "beneath the sea." Here the illusion is heightened by moving pictures of actual fish that are thrown on a screen that is used as a background. In the

Photos: (Top) Chrysler pavilion at the Fair is in the shape of an engine. **(Middle)** Outside view of the Florida pavilion which features porpoise shows from the Miami Seaquarium inside the building. **(Below)** Transportation and Travel pavilion with an undersea mural on the side of building. All photos in article by the author.

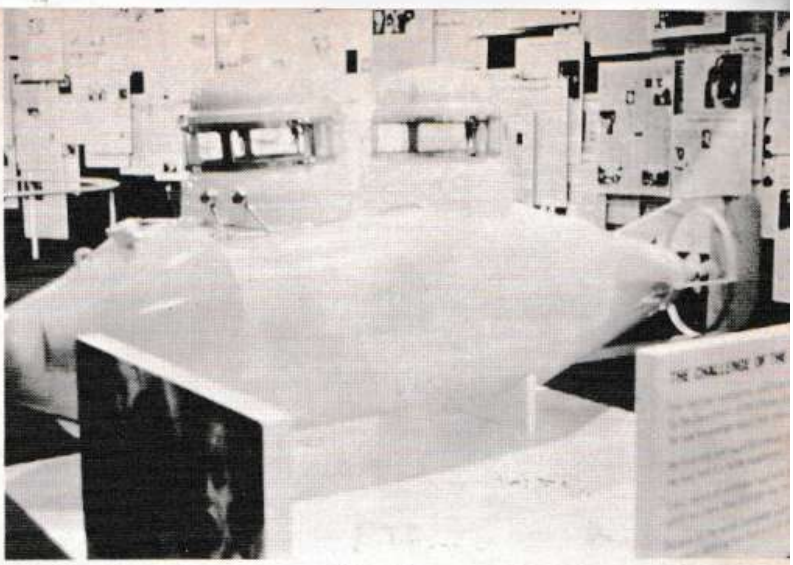


Photo: U.S. pavilion features a bright yellow two-man submarine used for underseas research by the U.S. Department of Interior. Purpose of the sub is to amplify search for new food resources.

foreground are authentically made models of three-dimensional fish which give the effect of depth. Here and there are underwater hotels with the guests aqua-scootering about and submarine trains working hard to haul away minerals being mined out of the sea's bottom.

One doesn't have to travel very far to find another underwater dramatic spectacle. Only across the road, a gigantic brilliant multi-hued mural is splashed across one side of the Transportation and Travel Pavilion depicting underwater beings that are presented with a great deal of artistic license. This is tied up with one of the live shows inside, "Underwater Sea Hunt."

Or if the aquarist-visitor should get tired of looking at not only real fish, but painted and filmed ones as well, he can step into the Chrysler's 100-foot building that is built just like an automobile engine to see all sorts of animated animals made out of various parts of automobiles. One of these is an enormous orange and red fish that keeps stretching out to extend its huge paw at some invisible prey with mechanical frequency.

The Bell System Exhibit, housed in a buildings that resemble an enormous elevated airplane wing, utilizes as part of their exhibit an excellent large color transparency of two male bettas "having it out" with one another. Also in this display is another transparency, this time of porpoises. The caption reads, "All Creatures Communicate – many creatures hear things unheard by man."

Porpoises are not only represented by photographs at the New York World's Fair, but in person as well in the Florida pavilion. A part of the Seaquarium show from Miami has been imported and a large porpoise pool and stadium has been erected under the plastic orange topped 100-foot tower of this pavilion. I attended the show held in this stadium on the third day after the Fair opened. This particular April day was not a good day in New York for any importees from Florida, man or animal, since the temperature was well down into the low forties with a stiff cold breeze blowing off from Meadow Lake. The human personnel of the show were going around bundled up to the teeth until time to actually appear when they reluctantly divested themselves of their topcoats and earmuffs. But in spite of the fact the 170,000 gallon porpoise pool was heated to a temperature of 68°, the porpoises were obviously holding a grudge against any human being stupid enough to haul them out of their nice worm Florida climate to bring them to an ice box like this. Happy, Skyrocket,

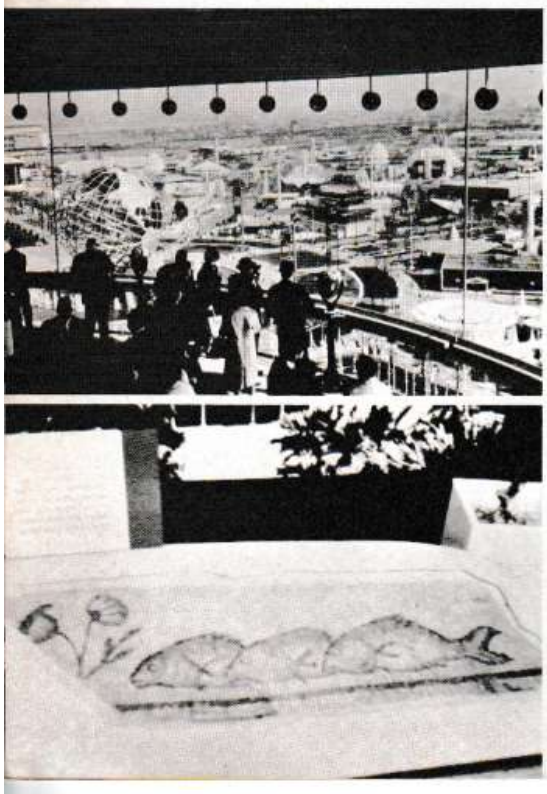
Elvis and Sparky would perversely take balls that I've seen them return with dog-like obediency to trainer Jimmy Klein in Miami, and toss them to some unreachable part of the pool where an attendant would have to lean over precariously to obtain them once again. It's funny, when the wind was in the right direction, I could swear that I could hear a sly porpoise laugh every now and again.

Even with their more or less passive resistance, they couldn't get even quite to the extent that 3-year old Ronnie, the sealion did. One of his tricks was to balance a glass of water on top of a stick, swim across the pool with it and gently toss it in the direction of his trainer, Dick Byrd, who would deftly catch it without spilling a drop. Somewhere down deep in his little sealion heart, it was evident that he had some getting even to do. Nobody had obviously explained to him any valid reason for taking a poor little sealion out of nice warm comfy Florida and transporting him where he got sealion-size goosebumps. Therefore, each time Mr. Byrd got him to try this trick, Mr. Byrd got the full glass of water hurled right at him with dreadful accuracy such as is only possible when a thing like this is done by an irate sealion with chilblains.

In the main Florida pavilion, the Floridians brag copiously about their magnificently colored native fish. In a number of places there are full-sized colored models with legends giving some of the facts on each particular species.

Not all fish displayed at the New York World's Fair are large. Two of the pavilions have aquariums in them with fish the size and kind that we have all nurtured at one time or another. The Formica World's Fair House is one of these. Just before one goes out through the exit, there are two large aquaria stocked and maintained by the Aquarium Stock Company of New York. In one of these are nothing but fancy goldfish of several different varieties. The other one is strictly for tropicals and contains, among other fish, several very large kissing gouramis which sparks the interest of Fair visitors as they meander past these tanks, should they be in a smooching mood, the fish, not the visitors, of course.

Two other tanks are found in a part of the exhibition inside the Protestant and Orthodox Center. Here a number of the religious groups represented have gone together to put up a display called "Galilee-Israel, Cradle of Christianity." Along with plants from the Holy Land and photographs were two fishy exhibits. One was a portion of a more than 1,000 year old mosaic floor that had been taken from a house in Israel and shipped over here for this exhibit. This floor featured three fishes, an important religious sym-



Photos: (Top) Overall view of the New York World's Fair taken from the top of the New York pavilion. **(Below)** Portion of 1,000-year-old mosaic floor taken from a house in Israel, featuring the important religious symbol of three fishes.

bol of that time since the letters in the Greek word for fish were the initials of the first letter in each of the words, "Jesus Christ, Son of God, Savior." When Christians were persecuted shortly after the death of Jesus, the outline of a fish was secretly traced on a hand or outlined in the dust of a road with a stick in order that one person might divulge to another that he too, was a Christian.

The living part of this display is found in the two tanks that contain fish from the Holy Land. One of these had fish from the Red Sea and unfortunately on the opening day most of the fishes in this tank had gone to their Maker. They had just been flown in from their native waters and something had obviously gone wrong. On the other hand, the second tank contained fish from the Sea of Galilee. These were the *Tilapia galilaea* or the Galilee cichlid, and were all doing just fine. No great shucks in the color department with their olive-brown hues on their strongly compressed bodies, but interesting fish nonetheless and a species that is seldom seen or imported into this country. So far, they have never been spawned in captivity. This is possibly the fish mentioned in the Bible from which the tribute-money was taken.

If the visitor-aquarist wishes to take something home with him as a souvenir from the Fair he can go into the Swedish pavilion and buy a large piece of Swedish glass that has been incised with a frosted etching of an aquarium scene for just slightly under one hundred dollars. Or if he wants something more in keeping with his probably by then flattened exchequer he can go into the French pavilion and buy a lavalier for his wife. These lavaliers come in two

Photos: (Top) "Galilee-Israel, Cradle of Christianity" exhibit at the Fair. Featured are two tanks of fishes, one from the Red Sea, and the other from the Sea of Galilee. **(Middle)** Looking down on the Unisphere with fountains at base from the top of the New York pavilion. **(Below)** Exotic goldfish are featured in this dramatic reflecting pool at the Eastman Kodak exhibit. "Planted" in the pool are golden aluminum "dandelions" just-gone-to-seed!

sizes and can be had for $2.95 and $4.95 respectively. Actually they are rather grisly little things – a necklace chain with a piece of clear plastic dangling from it that contains a dead tiger barb or a small angelfish entombed inside. Probably a happier choice would be to

blow the family to another strawberry waffle or a pizza and trudge on home empty handed. ◄

Smithsonian Institution Reprints Famed Book on American Fishes

THE Smithsonian Institution, in conjunction with T.F.H. Publications, Inc., has reprinted *Fishes of North and Middle America*, by Jordan and Evermann. Price is $25 for all four parts. All proceeds derived from the sale of the publication are designated "for research, collection or purchase of fish specimens, explorations, and publication of scientific reports related to aquarium fishes." The four volumes may be purchased from the Smithsonian Institution, Publications Office, Washington, D.C. 20560.

The *Fishes of North and Middle America* was originally published in four parts from 1896 to 1900 and has long been a standard work of reference to both freshwater and marine fishes of North and Middle America. It was first published as Bulletin No. 47 of the U.S. National Museum. It contained 2,737 pages and about 1,000 figures. The work has long been out of print and its price on the used-book market (where it has been rarely available) has been over $100. The new reprint edition is an exact duplication of the original except that the plates of the fourth volume occupy both sides of the page (thus making this bulky work physically somewhat smaller), and the "breaks" in the four volumes occur at different places. The original "breaks" and dates can be determined by consulting the first page of the first volume of the reprint.

"Jordan and Evermann" as these four volumes are often called was the last attempt to include descriptions of all North and Middle American fishes in one place. The work represents a summary of North American ichthyology at the turn of the Century and is extremely important historically. Many parts of the work have been superceded and made out of date by later, more detailed works but as a whole the book remains a valuable guide to the fish fauna of the North American continent. We are pleased to see the work available again at what we believe is a very reasonable cost.

Recently several large ichthyological works have been reprinted in Europe. The prices of these are so high (for example, Boulenger's four-volume catalog of the fresh-water fishes of Africa exceeds $100 in cost) that they will continue to remain beyond the reach of most serious aquarists – and many ichthyologists, too. ◄

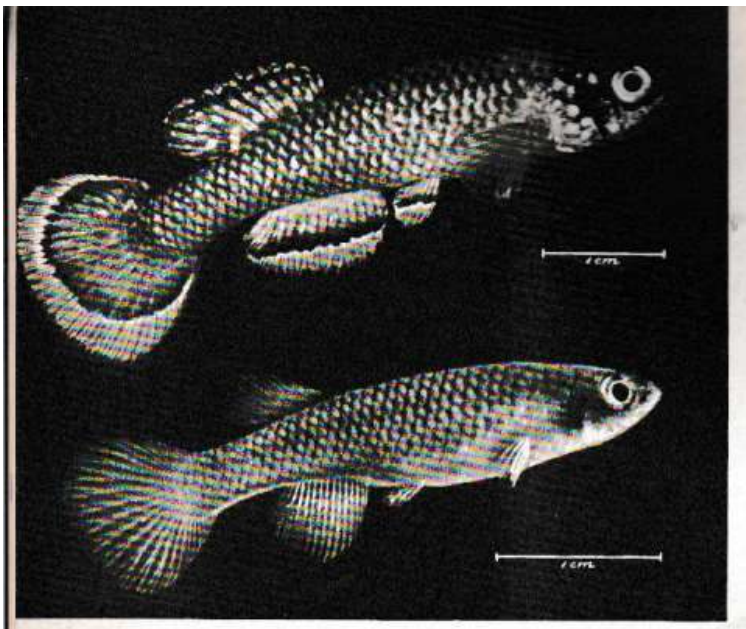
★ IDEAS ★

BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Getting Dry Food to Sink

Often I have trouble getting the floating foods to sink. Some of my fish eat in the middle of the aquarium, as they are adapted to this procedure. I usually put my selection of food in a small vial, partially fill it with water and then shake it. The food should then be put in the aquarium *slowly* as it sinks rapidly. Do you have fishes that eat at the surface? Just sprinkle the non-wet food on top. – *T. Harding Jones, Middletown, Ohio.*



Joergen Schéel
Copenhagen, Denmark

A broad cinnamon girdle around the body — an unusual offering for killifish fans

Aphyosemion cinnamomeum

PART I

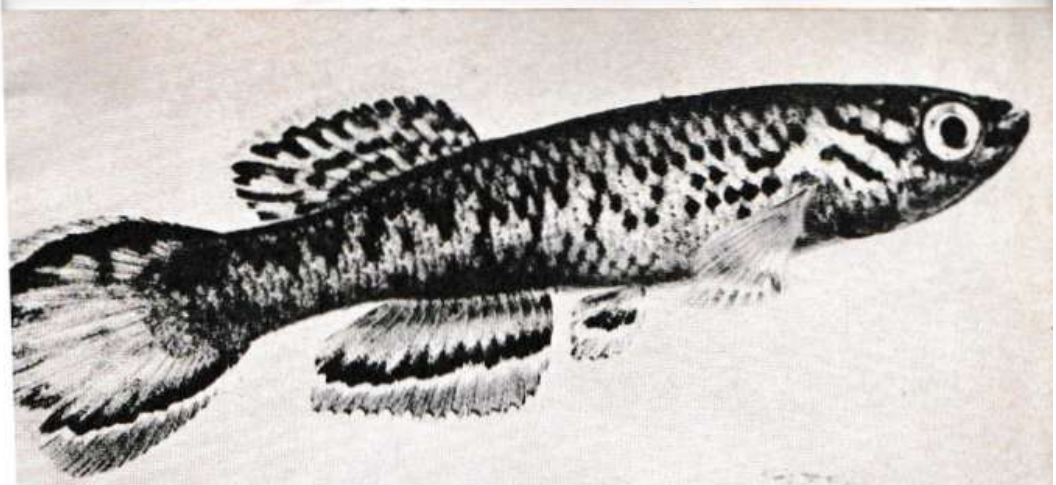
(Translated from the Danish by Albert J. Klee)

IN 1959, Stenholt Clausen returned from Nigeria bringing with him a small collection of aphyosemions containing four species. A year later, these species were placed partly in the tanks of Hans Klementsen, Hjortekaer, and partly in my own tanks. The future *Aphyosemion cinnamomeum* was taken over by Klementsen whereas I took charge of the *A. gulare* specimens from southwest Nigeria, the *A. filamentosum* from Ijebu-Ode and an unidentified species from Ndian River in northern Cameroun. The latter is still undescribed and will remain so until we have collected live material in south Cameroun during 1964-65. As Klementsen did not reproduce his species, he delivered the specimens to me. It was soon realized that the spawning normally takes place in peat and because of this, the eggs are like annuals. We soon raised a fresh stock of this fish. In March 1963, Stenholt Clausen described this species as *Aphyosemion cinnamomeum*, placing it into the subgenus *Fundulopanchax*.

Aphyosemion cinnamomeum is known from its type locality only. This is a small stream in a low mountainous area 44 miles north of Kumba in the northern Cameroun rainforest (an area of very high rainfall). The male of the species differs greatly from the common *Aphyosemion* style, not only by its strange coloration but also in its general appearance and behavior. In some ways it is rather *Nothobranchius*-like but one should not consider it as a link between these two genera.

The mature and active male is a

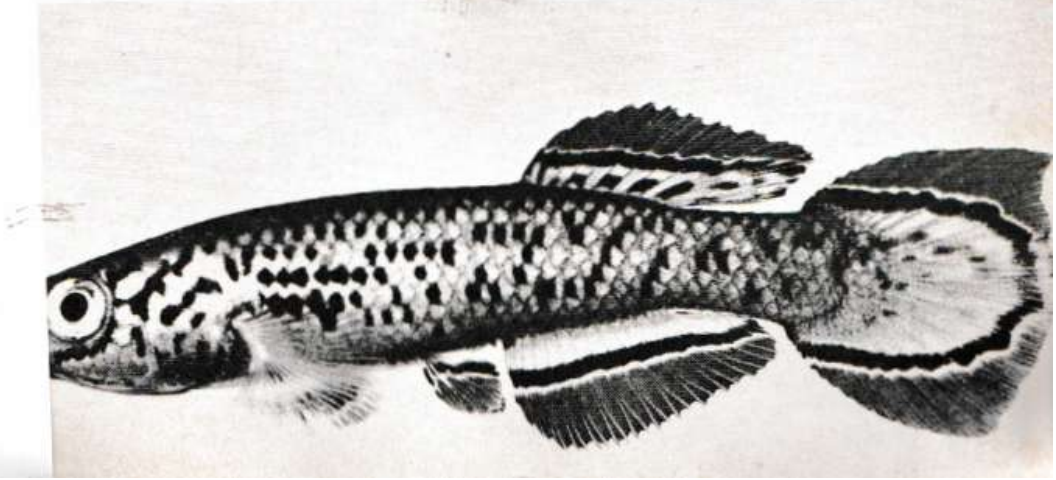
Photo: **Aphyosemion cinnamomeum**, male above, female below. All photos in article by the author.



beauty indeed when either fighting or flirting. However, normally his coloration is rather drab and no one would consider him to be handsome. When active, the body color is very dark all over. The brilliance seen on the sides of the body of most males of this genus is only present as very small spots reflecting a particular bluish-violet glow. In addition to this, the whole area of deep, blackish body color has a certain violet tinge except on the area next to the pectoral fins. These deep-orange colored fins continue their color into the sides of the body, forming a broad cinnamon girdle all around the foremost part of the body. This girdle is more easily seen on the sides of the body of either sex. The ordinary worm-like markings on the gill-covers of aphyosemions are here transformed into a marbled area behind the eyes. The ordinary, rather complicated throat pattern of the male *Aphyosemion* is not present and probably is not needed for identification as the male's throat when activated is colored by a deep, blackish-violet hue. Under the microscope, traces of the usual red pattern are seen below the eyes, at the corners of the mouth and also sometimes here and there along the line of side-line pores behind the lower lip. Traces of red pigments are found below the gill covers.

The ventral, anal and caudal fins have similar color patterns. Close to the body there is an even, deep-violet-blue color which often turns into a nearly black color when not viewed in oblique lighting. Then follows an even darker line which has a somewhat reddish tinge, and

Photos: (Top) Masculine intersex hybrid from male **Aphyosemion** species from Ndian River and female **A. cinnamomeum. (Below)** Hybrid male, **nigerianum** cinnamomeum. Notice shape of caudal fin.



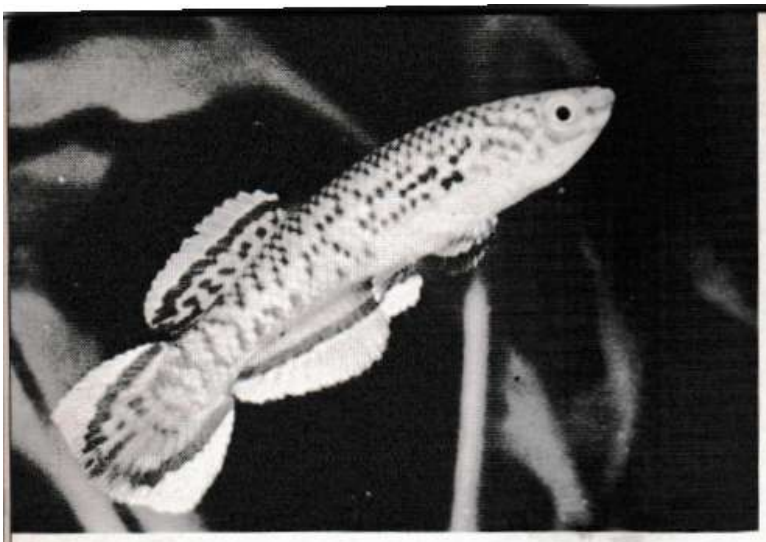


Photo: Hybrid male, **Aphyosemion nigerianum x A. cinnamomeum**, as photographed by the author, J. J. Scheel, F.A.I.

afterwards, a very thin bluish line with the outermost part of the fin being a brilliant yellow. When compared with the corresponding edges of *nigerianum* (the "yellow" variety), the color on *cinnamomeum* is warmer or more orange. At the hindmost part of the caudal fin the very dark separation line may not be quite unbroken and in such cases, the bluish coloration (guanin) of the inner part of the fin may spread into the yellow area, turning this into a brilliant green color. The color pattern of the caudal fin is not unlike that described for *Aphyosemion meinkeni* and also has a similarity to that of *Nothobranchius rachovii*. The dorsal fin is colored very much like the anal fin; however, there is a certain marbled pattern of more or less brilliant areas. The separation line is narrow and the outermost part of the fin is normally without yellow color. However, on a few males one may notice a very weak yellow coloration.

The female's color is a nearly uniform, olive-brown which, however, becomes lighter towards the belly. The unpaired fins and in particular, the anal fin, has a conspicuous lemon color when activated. There are no traces of dark spots in her fins, however, in incident light one may notice a certain marbled pattern in her dorsal and also her ventrals while the anterior edge of the anal may have some bluish brilliance as most females within this genus.

From Klementsen I received three males and a number of mature females. The males were of equal size but only one male had the contrasting yellow edges of its ventrals, anal and caudal. First I thought that there may be two kinds of males as we find in *A. nigerianum*. The two unimpressive males were placed into a big tank together with many specimens of *Aphyosemion, Epiplatys*, etc., whereas the handsome-colored male was used as a breeding male. Klementsen had had all individuals in a four-gallon tank and in this, they were raised to maturity. For many months the two "intersexed" males were kept under control and they did not develop any yellow coloration. Suddenly, they were just like the breeding male! Their age at that time probably was more than 12 months. I think that we may explain this in the following way:

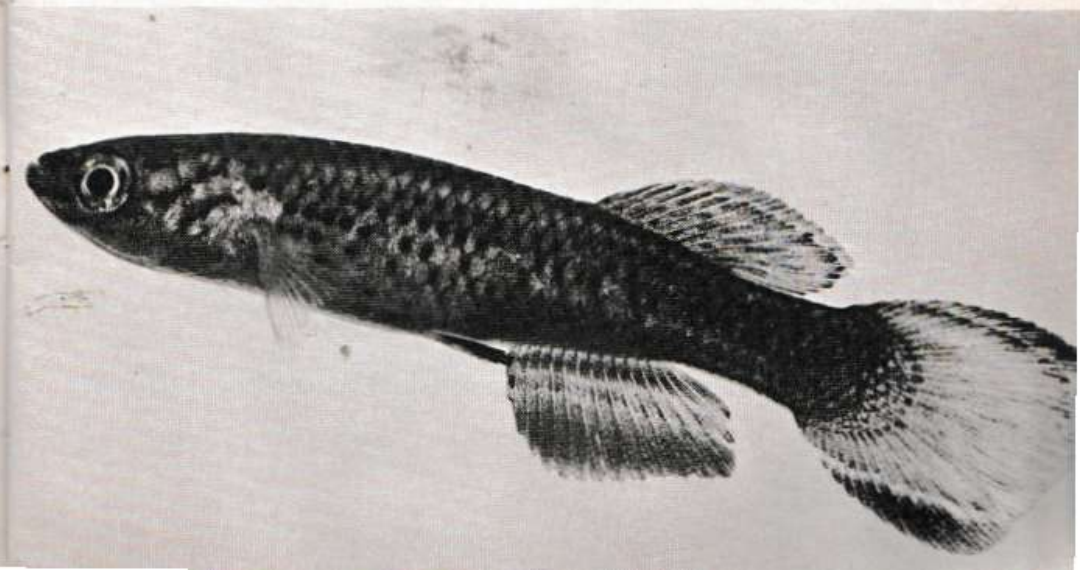
If you raise a brood of *Colisa lalia* (the dwarf gourami) in one tank you will realize that some individuals will grow more rapidly than others. At a certain time, one big male will start blowing bubbles and he will develop the beautiful colors of the mature male. Once so colored he will keep those colors for the

remainder of his life. Normally, only one male will mature like this. If you remove the mature male, his place will soon be taken over by another male which soon develops his own mature coloration. *Elassoma evergladei* from Florida has a similar behavior. In a brood of young specimens which are normally kept in a small tank, only one male shows the deep, velvet-black colors of the mature male. The other males are colored mostly like females, however, here and there on their bodies, black spots are seen. Now and then, one of these males within seconds, develops the matured colors of a breeding male and a fight may take place between the two black males. The loser after the fight, will develop the female-like coloration.

In my opinion, a similar system is working within populations of *A. cinnamomeum*. Breeders of killifishes know that one male normally will be able to serve several females, thereby forming a breeding team. I myself have used up to five females to each male with different species without getting more infertile eggs than usual. In nature, it may be important that only a few males develop into breeding males who govern a certain territory. In this way, a surplus of males does not develop all at once but rather are kept as reserves. A mature male is rather conspicuous as compared with females and unmatured males. He is more easily seen and taken by birds and fishes of prey. If the breeding male within a certain territory is lost, another male will take his place and keep the unmatured males from developing the yellow edges of the fins. If you place two mature males of this species in one tank, a fight very soon will take place. According to my own observations, the males of this species do not make "scissor-like" movements of dorsal, anal and caudal fins, and the movements of the males before and during the fight are more like *Nothobranchius*, i.e., a stretching of the fins and then "attack." Such attacks are often directed towards the brilliant yellow edges of the anal and caudal fins. The loser very often does not show anything but mere traces of his previous yellow edging. If the loser is not removed from the tank and should he survive the battle, the remains of his yellow coloration will be very inconspicuous. Thus, his body coloration will be very close to that of females.

If the breeding male of *Aphyosemion cinnamomeum* did not possess the yellow fin edges, he certainly would be very difficult to discover and females would be out of luck when they were ready to spawn. On the other hand, animals of

Photo: Masculine intersex of cross between Ndian River species and **Aphyosemion cinnamomeum.**



prey can take him more easily. Perhaps the lack of yellow color in the dorsal fin is a sort of a compromise between these two opposing forces since a reduction of the conspicuous pattern in this fin will decrease the vulnerability towards birds of prey, whereas such reduction does not interfere much with the possibility for discovery by females. An even more pronounced reduction of the yellow fin edges is seen inside the *Aphyosemion roloffi-calabaricum* group where the yellow color has been lost in both anal and dorsal fins. *(To Be Continued)* ◄

Spawning by this bottom-living fish takes place near water's surface

The Neglected Native

PART II

Paul Loiselle
Santa Clara University

IF THEIR NORMAL requirements justify their treatment as dwarf cichlids, then the spawning pattern of *Elassoma* qualifies its treatment as a top-spawning killie. Despite the fact that *Elassoma* is a bottom-living fish, spawning takes place near the surface of the water, in dense masses of *Ceratophyllum* or some similar floating plant. A spawning mop would probably be accepted as a substitute for the plants, although I have never tried one. However, those who want to experiment might keep in mind the small size of the breeders and make the mop looser and more open. The male chooses a more or less fixed site, and after eliminating any snails present, searches for a female. Once a sutable mate has been found, the male engages in a positively Polynesian display of tail-wagging and fin-snapping, occasionally interrupted by quick dashes towards the nest area. If the female proves reluctant, which she seldom does, then she may be prodded along by judiciously placed nips in the flank. Once she has entered the nest area, the male wraps his fins around her, an action that seems to serve as a "release mechanism" for the female. She deposits up to ten eggs, which are then fertilized by the male. This may occur two or three times a day for a period of two weeks. Then after a short rest period, the female is once more ready for spawning. The male exerts parental care of a rudimentary sort, which ceases once the fry have hatched. The fry cling to the glass and plants for two or three days, until they are free-swimming, the total time from spawning to the free-swimming stage comprising an interval of about six days. The fry require infusoria for the first week of their life, and then are ready for brine shrimp, nauplii and microworms. Growth is not rapid, but steady nonetheless. The fry are mature six months later, though precocity is often apparent up to six weeks earlier.

It will be immediately apparent to anyone who has ever bred killies that the lag between spawnings in *Elassoma* will lead to a disparity in the size of the fry much like that found in such fish as *Epiplatys chaperi*. While the fry will ignore the fry, the gap in sizes will have effects upon the growth of the fish. Consequently, some kind of sorting after the first three weeks is wise, lest the first-hatched individuals retard the development of their smaller brethren by eating most of the food. Strangely enough, the fry of this bottom-dwelling fish spend most of their time at the surface of the water. Long shallow trays are a great help in rearing them, for the reduced depth of the container also

reduces the likelihood of food falling below the level frequented by the fry. While not great jumpers, both fry and adults of this species are capable of some pretty spectacular acrobatics when frightened, a fact that makes a tight-fitting cover absolutely essential when keeping them.

Some index of the facility with which these fish can be bred is provided by my own experience with them. Despite the numerous disturbances of a college dorm room, two pairs kept in a five gallon tank produced twelve half-inch fry in the space of six weeks. No special care was given to the fry – I was totally unaware of their existence until the time came to take the parents home! The reader will perhaps now appreciate the statement made earlier that a pair or two of these fish will assure him a constant supply of *Elassoma*.

Keep them in an unheated tank, or else use the heater only as a means of establishing a lower limit in the temperature. These fishes should not be exposed to temperatures over 72° F. for *extended periods of time*. The temperature can be allowed to climb temporarily higher for breeding, as in the case in nature, but it should also be allowed to drop again once the spawning period is over. During the winter especially, high temperatures ought to be avoided. Fish kept at high temperatures are more prone to disease and are less vigorous and prolific.

All in all, *Elassoma evergladei* is a most desirable and beautiful little fish. Those who have never had the pleasure of keeping this bejeweled native are missing a most delightful experience. It would indeed be difficult to find a more attractive means of overcoming many people's resistance to keeping native fishes. ◄

★ IDEAS ★
BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Washing Gravel

My method of washing aquarium gravel is: Remove the gravel, put it in a bucket and go to the garden. Pour the gravel into a sieve or on a very fine screen. With the garden hose make a few passes over it with full pressure of water. This leaves the gravel clean and the garden fertilized. – *Jaime Ortiz Padilla, Mexico City, Mexico.*

(The authors won first place, goldfish class, in S.F.A.S. Show)

IF YOU APPRECIATE the color and beauty of the calico oranda goldfish on the cover, then you may be on your way to becoming a goldfish fancier. You start by admiring them, and gradually the desire to own them grows. Then one day you buy your first fancy goldfish. From then on you will argue with anyone who says they are not the most wonderful fish in the world.

A strong, happy fish of good temper and curiosity — one with few problems!

On Keeping Goldfish

George and Valerie Mitchell
Colma, California

The fish on the cover is a male Azumanishiki (calico oranda), about three and one half years old. This fish was imported from Japan by our friend Stanley Gee. His name (the fish) is "Stony"—our most prized specimen. We purchased him as a two-year old specimen in December 1962. At this time his color was much different. His basic color was bluish gray. The red, orange, and white were quite muted. The black markings alone were vivid. As he developed, the bluish gray area intensified to blue, and the other colors became more vivid. He was kept in isolation for about one year in a large tank. During this time he doubled his size, and at present is about eight inches long from nose to end of tail.

There are of course many other types of goldfish and we have some of almost every type. However the orandas are our favorites, and they offer a wide range of colors. The regular oranda is called shishigashira, and comes in chocolate, white, yellow, gold, red, blue, black and two color combinations such as gold and white. There is supposed to be a black oranda with a red hood. However, we have not seen it. We have in our collection: lionheads, pearlscales, shukins, orandas, telescopes, moors, celestials, bubble eye, and various fantails.

If given proper space and food the goldfish presents few problems. It is a fish of strong constitution, good temper, and full of curiosity. Our basic rules for the beginner in the goldfish hobby are:

(1) *DON'T crowd them.*

(2) *DON'T confine them in unsuitable containers, such as globes, tall thin tanks with little air surface.*

(3) *DON'T mix them with tropical fishes.*

(4) *DON'T catch them in nets, thereby tearing fins and scales. Instead, use a suitable container such as a large jar, catch them in it and transfer it.*

(5) *Keep them* cool, *sixty five degrees is ideal.*

(6) *Give them a varied diet, and finally . . .*

(7) *Keep their water filtered and clear.* ◄

Results of S.F.A.S. Spring Fish Show

THE 1964 Spring Fish Show sponsored by the San Francisco Aquarium Society was a huge success, according to the Show Committee headed by Ray Cabrera. Thousands of persons flocked to the show on the weekend of May 23rd, Cabrera said. Special thanks were tendered to Billie and Ron Hofling, Charles Bange and Ted Steinhauer for their assistance in running the show.

The show was judged by five experts from Southern California: Gene Wolfsheimer, Richard Haas, Dr. Sylvan Cohen and Dr. William Dewhurst. Winners received awards at the June meeting of the S.F.A.S. ◄

Photo: Ron and Billie Hofling at the headquarters table of the show.

WINNERS OF 1964 SPRING FISH SHOW

BEST IN SHOW—Tank No. 69 (Junior Community)—Randal West

Class 1(a)—Guppies—black, green or blue broadtails
First — Tank No. 101 — John Gabri
Second — Tank No. 49 — Joan Yamasaki
Third — Tank No. 50 — Joan Yamasaki
Special — Tank No. 50 — Joan Yamasaki

Class 1(b)—Guppies—red broadtail males
First — Tank No. 84 — Joe Hadac
Second — Tank No. 20 — Joel Cane & Mike Clement

Class 1(c)—Guppies — other males
First — Tank No. 85 — Joe Hadac
Second — Tank No. 12 — Jim Mills
Third — Tank No. 7 — Jim Mills
Special — Tank No. 5 — Jim Mills

(Continued next page)

Photo: Part of the crowds shown attending the S.F.A.S. Spring Fish Show, which was held in North American Hall at the Academy.

Photo: Awards meeting of the S.F.A.S. (l. to r.) Billie Hofling, Ted Steinhauer, Charles Bange, Joe Canuli, Frank Tufo, Bob Dempster and Treva Bell.

Photo: Some of the winners of ribbons at the 1964 Spring Fish Show, at the June meeting of S.F.A.S.

Photo: Many of the trophy winners at the 1964 Spring Fish Show, at the S.F.A.S. June general meeting.

Class 1(d)—Guppies — females
First — Tank No. 100 — John Gabri
Second — Tank No. 6 — Jim Mills
Third — Tank No. 8 — Jim Mills
Special — Tank No. 10 — Jim Mills
Class 2 — Marine Tanks
First — Tank No. 83 — Alfred Gianascol, M.D.
Class 3 — Community Tanks
First — Tank No. 15 — Mr. and Mrs. Ralph White
Second — Tank No. 58 — Art Almquist
Third — Tank No. 82 — Owen Kenny
Special—Tank No. 21—Mr. & Mrs. George Mitchell
Class 4(a)—Bettas spawned and raised by exhibitor
First — Tank No. 41 — Dennis O'Rorke
Second — Tank No. 40 — Dennis O'Rorke
Third — Tank No. 42 — Dennis O'Rorke
Special — Tank No. 81 — Wayne West
Class 4(b)—Bettas not spawned and raised by exhibitor
First — Tank No. 67 — Wayne West
Second — Tank No. 66 — Wayne West
Third — Tank No. 43 — Dennis O'Rorke
Special — Tank No. 65 — Wayne West
Class 5 — Terrariums
First — Tank No. 98 — George Silva
Second — Tank No. 81 — George Silva
Third — Tank No. 35 — Richard Hansen
Special — Tank No. 32 — John Uniack
Class 6(a)—Livebearers not spawned and raised by exhibitor
First — Tank No. 24 — Mr. & Mrs. George Mitchell
Class 6(b)—Egglayers not spawned and raised by exhibitor
First — Tank No. 29 — Mr. & Mrs. George Mitchell
Second — Tank No. 60 — Gary Kearns
Third — Tank No. 47 — Art Almquist
Special — Tank No. 56 — Art Almquist
Special — Tank No. 55 — Gary Kearns
Class 7 — Livebearers spawned and raised by exhibitor
First — Tank No. 99 — Ron Deacon
Special — Tank No. 97 — Ron Deacon
Class 8(a)—Killifishes spawned and raised by exhibitor
First — Tank No. 51 — John Romero
Second — Tank No. 80 — Art Almquist
Third — Tank No. 76 — John Romero
Special — Tank No. 52 — John Romero
Class 8(b)—Cichlids spawned and raised by exhibitor
First — Tank No. 71 — Joe Foon
Second — Tank No. 95 — George Wong
Third — Tank No. 36 — John Glennon
Special — Tank No. 72 — Ed Hallenbarter
Special — Tank No. 3 — Gertrude Castillo
Special — Tank No. 53 — Roger Sitkin
Class 8(c)—Anabantids spawned and raised by exhibitor
No exhibitors
Class 8(d)—Other egglayers spawned and raised by exhibitor
First — Tank No. 79 — Art Almquist
Second — Tank No. 73 — Ed Hallenbarter
Third — Tank No. 71 — Ed Hallenbarter
Class 9 — Junior Community Tanks
First — Tank No. 69 — Randal West
Second — Tank No. 45 — John Tate
Third — Tank No. 87 — Judy Dan
Special — Tank No. 16 — Richard Hansen
Class 10(a)—Dealers' Display — fresh water
First — Tank No. 37 — Capitol Aquarium
Second — Tank No. 38 — Capitol Aquarium
Third — Tank No. 47 — Bay Aquatics (Joe Canuli)
Class 10(b)—Dealers' Display — salt water Tropicals
First — Tank No. 96 — Dellbrook Tropicals
Class 11(a)—Goldfish
First — Tank No. 22 — Mr. & Mrs. George Mitchell
Second — Tank No. 54 — Mr. & Mrs. Ralph White
Third — Tank No. 25 — Mr. & Mrs. George Mitchell
Special — Tank No. 18 — Mr. & Mrs. Ralph White
Special — Tank No. 89 — Michele & Stephen Leialoha
Special — Tank No. 94 — Marshall Wong
Special — Tank No. 1 — Gertrude Castillo
Class 11(b)—Carp
No exhibitors
Class 12(a)—Pet
First — Tank No. 53 — Ed Guillory
Second — Tank No. 23 — Mr. & Mrs. George Mitchell
Third — Tank No. 48 — Dick Law
Special — Tank No. 78 — Art Almquist
Special — Tank No. 46 — John Tate
Class 12(b)—The Most Decorative Tank
No exhibitors
Class 12(c)—Novelty
First — Tank No. 70 — Margaret Motta
Second—Tank No. 30—Mr. & Mrs. George Mitchell

BOOK REVIEW

Book: "A Manual of Aquarium Plants," by Colin D. Roe; 7½" x 10", 110 pages, soft cover, 1964.
Publisher: Shirley Aquatics Ltd., Monkspath, Shirley, Solihull, England. Price postpaid, $3.50.

IN THE PAST I have recommended four books, each reasonably priced, that are basic to any aquarist's library (as a refresher these are: Sterba, "Freshwater Fishes of the World"; Innes, "Exotic Aquarium Fishes"; Emmens, "Keeping and Breeding Tropical Fishes," and Duijn, "Diseases of Fishes"). I should now like to expand this basic list to five with the addition of Roe's "Manual of Aquarium Plants." (The aquarist will find these five books to form a very fine and concise library, covering a catalog of fishes, general fishkeeping and breeding, diseases and plants). Some hobbyists may already have a copy of the first edition of this plant book, published in 1960. The first edition, however, has only 64 pages to the second edition's 110 and thus we are really talking about two entirely different books.

The Manual is arranged alphabetically by genus and then within each genus, alphabetically by species. With this system, therefore, no index is needed but aquarists desiring information about a particular plant will have to be fa-

miliar with its scientific name. For example, if one desires information about underwater clover, one must know enough to look under *Marsilea*.

The Manual is very concise. Immediately after each new generic heading there is a brief discussion of the genus as a whole. Each species (in addition to its scientific name, synonyms and distribution) is provided with a short description (usually illustrated) and in most instances, notes on its cultivation. One cannot complain about scope. Mr. Roe, for example, describes sixty species (and or subspecies) of *Cryptocoryne!* These descriptions and notes do not waste words but they are more than adequate for the average aquarist. The illustrations are almost all drawings but very good ones. As a matter of fact, for identification purposes I suspect that drawings are superior to photographs for the later often bring in extraneous nuances that only confuse the viewer.

That the Manual is authoritative there is no doubt. Although it is not a scientific work (nor does it claim to be . . . American authors could follow Mr. Roe's modesty to decided advantage) the author has had the assistance of some leading botanic authorities in its preparation (e.g., Dr. Heino Heins of the Paris Museum; Prof. H. C. D. de Wit of Holland, the Royal Botanic Gardens, etc.). The brief preface provides useful information on the scientific names of plants, also. The latest classification of plants (mentioned in the Manual) as used by the Kew Herbarium is presented at the rear of the book as well as some general remarks on plants and the "decorative aquarium."

There are some important changes in nomenclature that are noted in the Manual. For example, the plant known in the hobby as *Cryptocoryne "cordata"* is really *C. Beckettii*, the true *cordata* having broad leaves similar to a *radicans* swordplant. It (Beckettii) is a very variable plant and there are a number of botanical forms. We find also that the correct name for the Amazon swordplant is *Echinodrus paniculatus* (two varieties: *E. paniculatus* var. *gracilis*, a narrow-leafed form and *E. paniculatus* var. *Rangeri*, the well-known broad leaved form). The true *E. brevipedicellatus*, a name erroneously applied to the Amazon swordplant, is really the popular "junior swordplant."

There are many interesting observations on aquarium plant cultivation in this book. For instance, it is suggested that although *Hygrophila polysperma* is very seldom cultivated in this manner, it can be grown as a bog plant and cuttings transferred to the aquarium. In this way, the plant undergoes an environment similar to its natural state and will experience very strong growth. This reviewer has always had trouble with *Ludwigia* and Mr. Roe's suggestion that the plant should first be grown emersed, then transferred to the aquarium as required is most helpful. Want a hard-water or even a slightly brackish water *Cryptocoryne*? Then obtain a specimen of *Cryptocoryne ciliata* as it is one of the few members of the genus that can take such conditions!

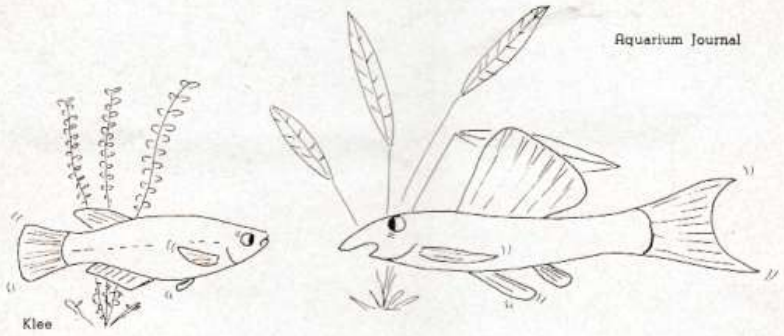
The Manual could be improved by the addition of a popular name index and information regarding the meanings of each of the scientific names given. Many aquarists will wish for more detail in both descriptions and cultivation notes but this is a good book and even more. Mr. Roe is to be congratulated on an excellent job and I sincerely recommend the Manual to all hobbyists. ◀

— *A.J.K.*

Albert J. Klee

looks

• Under the Cover Glass



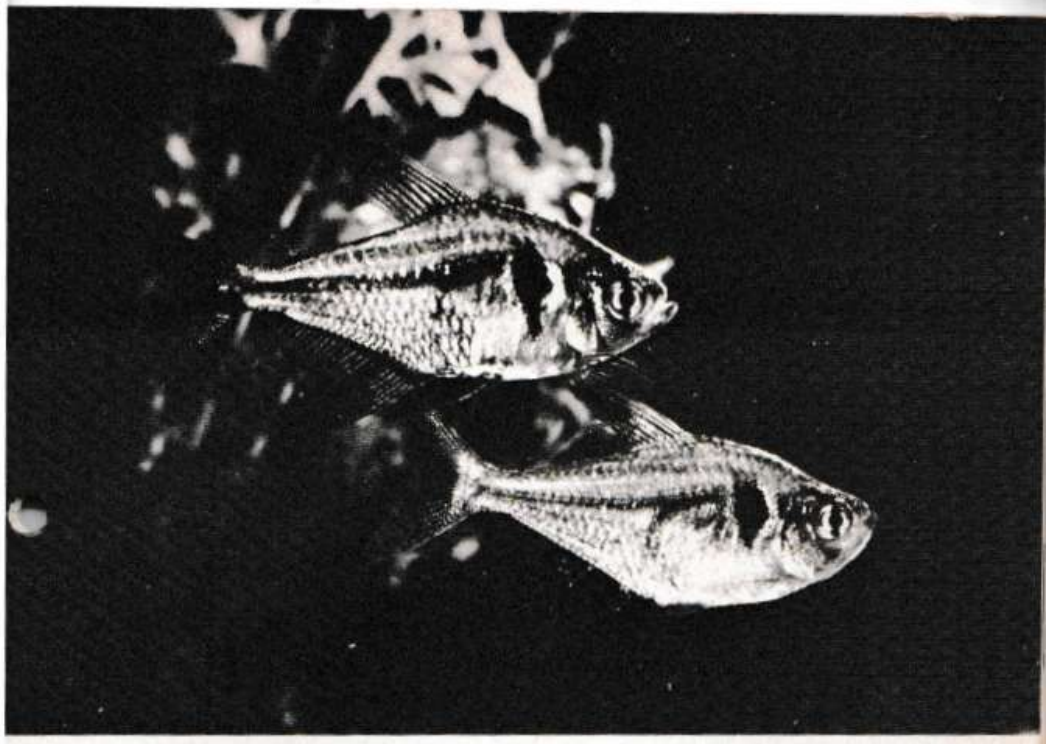
"I know what I am . . . I just can't pronounce it!"

NOW THAT THERE successfully have been organized two associations dealing with selected aquarium fishes (i.e., AGA – guppies and the AKA – killifishes . . . a third, NGS – goldfishes, is somewhat in doubt at this time). One wonders if similar organizations might not also be developed for other fishes. Two possibilities immediately come to mind: bettas and cichlids. The first would most likely resemble the AGA since we are dealing here with variations of a single species (although betta fanciers could conceivably entertain the several other species of *Betta*). A strong goal would be linebreeding to perfect selected strains. The latter group would most likely resemble the AKA since it would be concerned with an assemblage of species and the goal of linebreeding relegated to a relatively low priority.

At present, this columnist is concerned with sundry species of what are commonly called "dwarf cichlids." Now this term has been bandied about and much criticized but as far as South American cichlids are concerned, it includes most assuredly species of the genus *Apistogramma*. To this we might add *Nannacara*, *Crenicara* and certain diminutive species of *Aequidens*. When African species are considered, selected members of numerous genera are probably eligible for this designation (*Paelmatochromis*, *Nannochromis*, etc.). Since cichlid fanciers still do not have any formal organization, this column will devote a reasonable amount of space to these fishes now and in the future.

Recently, I have been asked on a number of occasions how I spawn dwarf cichlids. Although one must always realize that cichlids tend to be individualistic creatures, there are certain standard procedures I follow in attempting to reproduce dwarf cichlids. But these are only my personal, preferred techniques and to suggest that they are the only techniques that will "work," would

(Continued on Page 359)



A tank of tetras is most impressive —
may require less care than other fishes

Black Phantom Tetra

Dorothy O'Quinn
East Point, Georgia

The more I work with tetras, the more fascinating they become to me. A tank full of nothing but tetras is not only lively, colorful and attractive, but seems to stay cleaner and require less maintenance than tanks of some of the other fishes. Most tetras live together peaceably and, when groups of more than one species are kept in the same tank, it's interesting to watch each little fish as it seeks the companionship of its own kind.

Last summer I acquired my first pair of black phantoms, *Megalamphodus megalopterus*. But summer is often full of various activities – trips or visitors – and it is not always easy to concentrate on a new breeding program. As last summer seemed to have more interruptions than usual, it was fall before I had time to work with my charming little newcomers, but I now have three different sizes of the youngsters swimming around in their respective tanks and I must say I have felt repaid for my belated efforts.

The phantom looks somewhat like the serpae – especially when it is small. The body is pink with a blackish overcast. The female has a black crescent-shaped spot in the tail and a rather large black

Photo: A pair of **Megalamphodus megalopterus**, owned and photographed by Gene Wolfsheimer, F.A.I.

dorsal, held erect. The adipose and ventral fins are small and bright red; the anal fin is edged with black and a black bar on the "shoulder" shows some blue iridescence around the edges when in the proper light. The male is easy to distinguish as he is generally darker, has a black adipose and ventral fins and a longer dorsal that curves to the back similar to the rosy tetra. His "shoulder" spot also has "spangles" around the edges.

Phantoms spawn in the same manner as serpaes, emperors, glowlights, etc. They need soft water, but the water pH doesn't seem to make much difference. I keep in neutral or slightly acid. I like spawning moss as a medium, but a nylon mop would probably do just as well. A thicket of plants such as *Myriophyllum* or hornwort is fine, but the drawback is that in keeping the tank darkened the plants tend to shed, making a mess on the bottom of the tank. This can make the fry hard to find.

I have recently made one change in my tetra breeding tanks that I think is an improvement. Where I was using a bare bottom tank with only an air stone, I now use an under-gravel filter with white (French's bird gravel) sand on the bottom. I wedge a plastic gravel guard (optional) across one end to leave a bare feeding area, place the moss on the sand toward the other end and shade it with a piece of cardboard over the glass cover. I do not use any plants. There are two advantages in this set-up: first, the fry are easier to see on the white sand and can be found much sooner; second, the tank stays in better condition because the filter can help take care of excess food that may be put in during the time the undetermined number of fry are staying up in the moss and too small to observe closely.

My phantoms spawn readily but are slow growers. Twice I have run a little experiment with them and emperors, setting up two tanks exactly alike and spawning emperors in one and phantoms in the other at the same time. Each time I had a larger number of phantoms than emperors; the phantoms were easier to see in the beginning, but progressed much more slowly. They didn't seem to be able to take brine shrimp as quickly and when, at the end of the third week, I was able to move the emperors into a larger tank, the phantoms were still very small and hopping back up into the moss, and I had to wait another two or three weeks before I could move them. By that time they were just beginning to shape up whereas the little emperors were already well shaped and growing rapidly.

★ IDEAS ★

BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Removing Calcium Deposits

Unsightly mineral deposits, mostly calcium carbonate, occur on the tanks of those who live in areas with hard water. This can be quite a problem. I live in such an area and have tried many ways of removing the deposits. The method I use is as follows: Materials, cotton swabs, 10% hydrochloric acid, (pool acid will do) and household ammonia. Procedure: Dip a swab in 10% acid solution. Be careful, it is powerful stuff! Swab over the deposits and do this at least three times or until the spot, or "ring" disappears. Take a clean swab and dip in ammonia, swab over the same area. The ammonia will neutralize any acid left. Wash tank out very carefully and with several changes of water and scrub thoroughly with a rag. *Caution do this only on a tank that is empty of everything.* – Ed Fetherston, Pompano Beach, Florida. ◄

When the phantoms were in a larger tank without the moss to hide in, I could see them better and they were really cute to watch. They were a deeper shade of pink than the adults, probably because their tummies were stuffed with brine shrimp. First they had a speckled look, but soon lost this as their little dorsals started to show the black spots and the shape of the anal fins could be distinguished.

It's interesting to watch young fishes as they go through the period in their lives when each day seems to show a change in growth and development. When I buy fishes, I always like to get them as small as possible and finish raising them myself. But there is a period between the time a tiny speck hatches from an egg and the time it begins to take on the shape and color of its parents that can be most gratifying to almost any serious hobbyist, and this is an experience that will have been missed if the fish is bought. ◄

CLUB NEWS

San Francisco Aquarium Society, Inc.

The next regular meeting of the S. F. A. S. will be Thursday July 2, 1964, at 8:00 p.m., Steinhart Aquarium, California Academy of Sciences, according to Robert P. Dempster, President.

The famed film, "The Sea Around Us," made from Rachel Carson's equally famous book, will be shown as a part of a "Family Night" program, Frank Tufo, Program Chairman, announced.

Fish of the Month competition for July will be (1) Male *Betta splendens*, (2) *Corydoras*, and (3) Livebearers (Junior Members only – under 18 years of age), according to Charles P. Bange, Chairman.

Ray Cabrera, Librarian, urged that members make use of the Society library, open a half-hour before each meeting, and also reminded those members with overdue books to please return them so that others may share the library facilities. ◄

★ IDEAS ★
BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

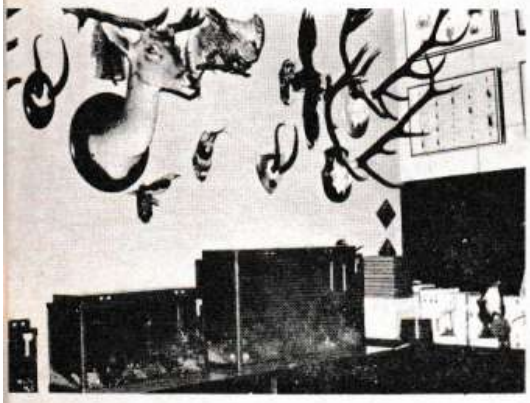
Cave Decoration

An attractive cave-like decoration can be made simply with five rocks and a piece of colored glass. Arrange two rocks of appropriate size several inches apart. Place the piece of glass across the top, then two smaller rocks above the original ones but toward the rear. Then an appropriate rock toward the front to hide the glass. As the light filters through the glass it makes a beautiful cave. – *V. Walters, Oak Park, Illinois.*

FINNY FOLKS

By Diane Schofield

IN MY LAST COLUMN I let you in on a rather different bit of merchandising which included side by side displays of our damp little pets and the white porcelain fixtures that are essential in any powder room. This past month I ran onto still another off-beat combination.



Before leaving the States I had heard that this shop was a "must" to visit as it was the largest of Madrid's approximately three or four fish stores. Thus, as soon as I could get away from my duties as a "People Herder" (Tour Courier), I went to 55 Avenida Jose Antonio to see just what Spain had to offer the fish fancier.

The shop was located in a pleasant little arcade with other shops and looked much like an ordinary fish store from the outside. But once inside I couldn't confuse it easily with any other fish emporium! From every available space, stuffed, mounted heads of a vast assortment of animals peered glassily down at the customers. Birds poised silently on dead branches like small feathered statues and beetles glared stoically up from drawers. In short here was a shop combining taxidermy and fishes.

This fact was brought home to me rather smartly when, in order to get more of the shop into the range of my camera, I kept backing up. Suddenly my foot hit something and down I tumbled. Mr. Juan Rene Critikian, the owner of the shop, rushed over, I thought, to solicitously help me up. Instead, I saw him rush past me and pat his stuffed deer on the head and murmur, "Thank God, it wasn't worse!" I never had a thing against stuffed deers, but I never quite expected them to be lurking around in a dark corner of a tropical fish store. I do hope that a few band-aids fixed it up just as good as new.

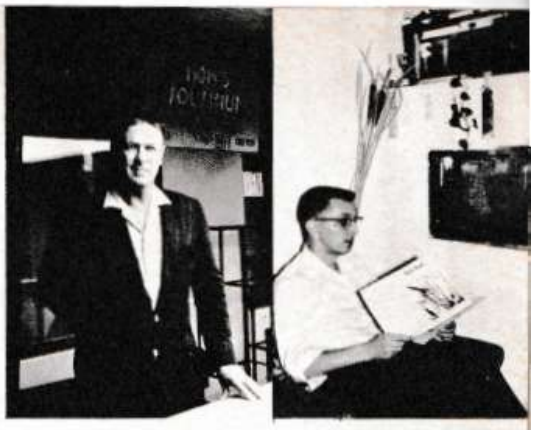
After we staunched the flow of blood on the stuffed deer, we got down to dis-

Photos: (Top) Interior of Juan Rene Critikian's Aquarium shop in Madrid, Spain, showing the cohabitation of stuffed animals and non-stuffed fishes. **(Middle)** Shop owner Critikian makes the fancy Spanish wrought iron tank stands shown here. **(Below)** Exterior of Juan's shop in Madrid. All photos by the author.

cussing the aquarium hobby and the woes of a dealer in Spain. To be a dealer in Spain, so it seems, one has to be almost self sufficient, raise one's own fish, make your own fish food and tanks. The tanks that he makes were among the most attractive and different that I had ever seen. The frames are covered with baked enamel because stainless steel is not obtainable at a reasonable price in Spain. These frames are finished in various shades of maroon, gray, green, etc., and blend well with the wrought iron stands that have a definite Spanish feeling in the scroll-like design. The hoods are completely different from anything that we know – a large rectangle is cut into the top and a piece of sanded glass inserted. It is then possible to feed the fish without removing the hood. Illumination is provided by a "fluorescent-shaped" incandescent bulb that has two screw-terminals, one on each end. How one screws a bulb simultaneously into two sockets is something only Spaniards know so far as I am concerned.

• • •

Another bit of interesting information that I discovered on my people-herding tour of duty was a brand new aquarium society that is flourishing. Since I have an overwhelming desire to seek out tropical fish stores, when I reached Bermuda you know what I did. There is only one shop in Bermuda that is devoted exclusively to fish and that belongs to Mr. Robert Doe. There in the window was an announcement of a meeting of the "Bermuda Fin Fan Club." Of course, I had to get to the bottom of this, since I was completely unaware of it. When I questioned the man who came out to meet me, he said, "Well, the president is sitting right back there!"



Photos: (Top, left) President of the Bermuda Fin Fan Club, Ross Doe, posing in front of Bob's Aquarium in Bermuda. **(Top, right)** Ervins Liepa shown reading a copy of "Aqua News" which he edits for the Minnesota Aquarium Society. **(Middle)** Baked enamel (red) tank that Juan Critikian makes in Madrid. **(Below)** Col. Harry MacDougall of the Suncoast Aquarium Society.

And so he was – Mr. Ross Doe, the father of the owner of the shop.

It seems the club has only been in existence since January, 1964, but in April they put on a show at the Agricultural Exhibition with an excellent

turn out from their members. Not only that, but they publish a fine little bulletin called, "Something Fishy" that has a section called "Fan Tales" devoted to experiences of their members with fishes. An example of the contents can be found in their March issue. It involved a gravid female swordtail which had just died. One of their members, Darnley Evans, "– took a razor blade, split her open and put all the 'innards,' eggs, young and all in a saucer of warm (85°) water. In about 10 minutes the baby swords started wriggling their way out of this mess and soon were darting around the saucer. They were eventually transferred to their own tank and were in good condition at last report."

Both Mr. Does were surprised that clubs exchange bulletins with one another and said that they would be most pleased to start doing so. Their mailing address is Bermuda Fin Fan Club, c/o Bob's Aquarium, Walker Arcade, Hamilton, Bermuda.

• • •

There is one man in our hobby who has earned a title that is likely never to be taken away from him, and that is "Good Will Ambassador Without Portfolio of the Tropical Fish Hobby." Every summer, Col. Harry MacDougall sets out all by himself in his car, and with his assortment of cameras on board, starts a safari that often stretches from one seaboard to the other. The main purpose behind this yearly journey is visiting various aquarium societies; the people of note in the hobby, who may or may not belong to a society; and the tropical fish shops in each city that he visits. When visiting any aquarium club, there is nothing that "Col. Mac" likes to do more than to put on a program for them with his excellent slides of both fish and the various fish stores that he has encountered on his travels.

• • •

St. Petersburg may have Col. Mac and Doug Bliss, but its sister city, Tampa sports one of the most unusual tropical fish stores on record, the Minnehaha

Well-tanked Teepee

Aquarium. I don't recall too many stores having a stream running through their shop, however the real point of variance is on the outside. How many tropical fish stores have you seen in the shape of a wigwam?

• • •

Are you tired of being belted by a vast assortment of confusing common names? There is one editor of an aquarium society bulletin that decided to do something about it. Ervins Liepa, who edits "Aqua News" for the Minnesota Aquarium Society took matters into his own hands, and has put out a booklet, "Common Names of Aquarium Fishes." He prints it himself and sells it for the rather nominal sum of 50c to anyone who will contact him at his home, 5109 15th Ave., S., Minneapolis, Minn. ◄

CLUB NEWS

Next meeting of the G.G.G.G. will be Tuesday July 21, 1964, at 8:00 p.m. at the Visitation Valley Community Center, 66 Raymond Ave., San Francisco. Meetings are held the third Tuesday of each month. The public is invited to attend. Coffee and cake are served, according to Virginia Masters, Secretary.

New million-dollar diversion for honeymooners

offers porpoise tank, penthouse restaurant

Niagara Falls Aquarium

One of the outstanding aquariums in the world will be built in Niagara Falls (N.Y.) under the supervision of a Cleveland firm, Aquariums, Inc.

Plans for the aquarium, first of a series planned by the organization, were developed by William E. Kelley, world-famous aquarist, and until recently director of The Cleveland Aquarium.

It will occupy a full city block bounded by 2nd and 3rd Streets and Walnut and Cedar Avenues along the Robert Moses Parkway. The cost of the land, building, equipment and marine animals will exceed $1,000,000, the company announced.

"The Niagara Falls aquarium will incorporate new marine technology which should allow us to display animals so delicate that they have never before been shown to the public," Kelley said.

The exterior of the building, which has been designed and engineered by Howard Cain of Dickerson and Cain, Cleveland architects and engineers, will be of aquamarine brick with marine sculpture by a noted Cleveland sculptor, Viktor Schreckengost.

Construction of the aquarium is expected to start in July 1964, with completion scheduled by June 1965. Design and engineering are completed, and deed to the land has been transferred.

In the center of the circular 30,000 square-foot building will be a huge porpoise tank. Porpoises will be trained to accept blindfolds, then search out food with their natural "sonar" tracking systems. Sounds of the porpoises as they

Sketch: Circular 30,000 sq. ft. building of the new Niagrara Falls aquarium in New York.

track down their food will be broadcast through microphones around the 75,000 gallon tank.

Smaller displays of exotic marine life, include types of octopuses which have never before been shown in an inland marine aquarium, will run the full circle of the interior of the building. Plans call for a total of some 50 separate displays.

Man-eating sharks, electric eels, piranhas and other notorious marine life will be seen along with gentler and more beautiful fish from every part of the world, reflecting the international character of the Falls area.

According to Kelley, emphasis will be placed upon the educational value of the aquarium. "Our displays will show the natural abilities of marine animals," he said. "It is not necessary to put on a circus. By themselves, marine animals are the most intriguing in existence."

★ IDEAS ★

BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Good-smelling Microworms!

Microworms are a good food for new fry and I have come up with a formula that does away with the odor that the old formula had. Instead of using oatmeal or baby cereal to start a culture of microworms, try using Wheaties. Crush the Wheaties, add water to moisten and a little yeast. Into this mixture add microworms from an old culture, cover and set aside for a couple of days. This culture should not be too wet but only wet enough to form a "cake." When feeding, simply add a little water, swish around and strain through a cloth. Turn the cloth upside down in the tank that is to be fed and there you are! – *Roy Anderson, Omaha, Nebraska.*

A series of displays will show North American game fish. Additional plans call for cutaway exhibits showing how the Falls and the Great Lakes came into existence.

The upper section of the aquarium will have a restaurant with a view of the porpoise tank. The site commands a splendid view of the North River Gorge, on Rainbow Bridge, the city of Niagara Falls, Ontario and an edge on view of the Falls. Supporting facilities will be in the basement level.

Niagara Falls, New York was chosen by the organization as the first site for an exhibition aquarium not only because of the great international tourist traffic, but also because of the interest of the community in developing high-level attractions for visitors. Another reason is the orientation of the area to the water, its beauty, and its economic significance.

The special displays are made possible by a new type of synthetic sea water developed by Kelley which will sustain marine life in peak health. Development work on the sea water was carried on at The Cleveland Aquarium and is sufficiently advanced so that the synthetic water would be used even if an aquarium is built by the group in an oceanside site.

"We are able to provide a completely controllable marine environment," Kelley said. "Every constituent of the water is known and controllable. This means that first-rate inland marine aquariums are now possible.

"The water is clearer than natural sea water. We can display, for example, the giant king crab of Alaska and the basket starfish, which has five arms that open out to form a net that catches fishes. These and other marine animals which we will have regularly on display are so delicate that they have rarely been

shown even in oceanside aquariums. We expect to have the healthiest marine life in any aquarium."

Aquariums, Inc. was formed last month by Kelley, who is executive vice president and manager; Vincent Smith, a Cleveland businessman and attorney, president, and a group of other Cleveland businessmen. In addition to building exhibition aquariums, the company will conduct continuing research in the marine sciences, consult with public aquariums, manufacture and sell complete systems for maintaining sea life in restaurants at wholesale outlets. Headquarters of the new organization are in Wickliffe, Ohio. ◄

WANT ADS - $2

Hobbyists, breeders, and dealers **(only)** may now place Want Ads in **The Journal.** An opportunity to contact other hobbyists for wanted fishes or equipment, or sell same in a Journal Want Ad! The cost is nominal: $2.00 for 20 words, plus 10 cents each additional word. Send your ad along with payment today!

FOR SALE

100% dehydrated worms—for aquarium fishes. 12 grams, $1.75, 8 grams, $1.20, 4 grams, 65c, postpaid. Coarse, medium or fine. Lake Sawyer Worm Gardens, Route 1, Box 979-A, Kent, Washington.

Far East Tropical Fish — Write for price list today for the high quality fish with the most reasonable price: Larsens Aquarium, Prakanong P.O., Box 125, Bangkok, Thailand.

Live cultures—Dwarf white worms, $1.50. Microworms, $1.25, including instructions. Airmail 50c additional. Add sales tax where applicable. Blue Lagoon Aquarium, 1644 Irving St., San Francisco 22.

Salt Water Fish — coral, sea horses; not cheap, but fish are all healthy and disease free! Coral Reef Exhibits, P.O. Box 59-2214, Miami (AMF BR.), Florida.

Live Cultures—Tropical red worms, $1.25; white worms, $1.25; micro-worms, $1.25. Any two for $2.25. All three for $3.00. Generous cultures. Shipped postage prepaid. Instructions included. Air mail 50c additional. Culture Gardens, 454 Leonard, N.E., Grand Rapids 5, Michigan.

Marine Fishes from Philippines—Exporters. Conditioned, various colorful species. Inquire direct: Tropical Pet Shop, 1008 Ongpin Street, Manila, Philippines.

Serious? — Then feed fish **live** food! Directions (we pay postage): Wingless fruitflies ($1.75), Microworms ($1.25), Whiteworms ($1.50.) Sudden service! Airmail .30c extra. Special delivery .30c extra. Aqua Engineers, Box 1-B, Ortonville, Michigan; or Box 97, St. Basile le Grand, Quebec, Canada.

Microworm Cultures — only $1.00. Instructions and extra food included. Airmail 50c extra. Postage prepaid. Microworm Cultures, 8 Hamilton Road, Wakefield, Mass.

Aquarium Show Plants—greenhouse grown — Includes one Amazon Sword; 4 Crypts; and at least 8 other varieties. Satisfaction guaranteed. $5.50 pp in U. S. Westerleigh Aquarium, Box 11, Staten Island 10314, New York.

Japanese Carp — Any size, any color. Shipments anywhere in U.S. Prices upon request. G. R. Gillespie, 15388 Churchill Street, San Leandro, Calif. Phone (Day) 357-8280; (Night) 638-0008.

Green Discus — Tank-raised babies $7.50 each. Also big female, excellent mother, $50 or highest offer. Wanted: Young, genuine blue discus. Rolf Jensen, 312 Third St., Davis, Calif. 95616. Near Sacramento.

Topsail platies — Red-tailed blue variatus, Hi-fin swordtails, red velvet or red velvet wag. Young stock $10 pair, airmail postpaid. Mrs. Don Norton, 2305 Broadmoor, Ames, Iowa 50010.

Exotic Marine Specimens—Aquarium supplies, illustrated catalog. Write Box 626-116, Dania, Florida.

Imported African Platannas — Entirely aquatic, tongueles, noiseless. Of the frog family. Extremely interesting. Six for $7.75. Frogarium, Box 87, Cockeysville, Maryland.

White Convict Cichlids — (mutant **C. nigrofasciatum**). Will sell or swap for other unusual fish. Can be mailed easily. Halverson, 512 Hicks Ave., Jackson, Ala.

WANTED

Oscars — Five inches and over. G. R. Gillespie, 15388 Churchill St., San Leandro, Calif. Phone: (day) 357-8280; (night) 638-0008.

Experienced Fish Breeder wanted — (egg-laying varieties). Must have at least five years experience with a Florida hatchery. Apply: Eastland Tropical Fish Hatchery, Inc., P.O. Box 302, City of Industry, Calif.

PRODUCT NEWS

New Flakefood from Germany

Longlife Fish Food Products proudly announces a new flake fishfood from West Germany – **BiOrell** – an ideal, nutritious food for both freshwater and marine tropical fishes.

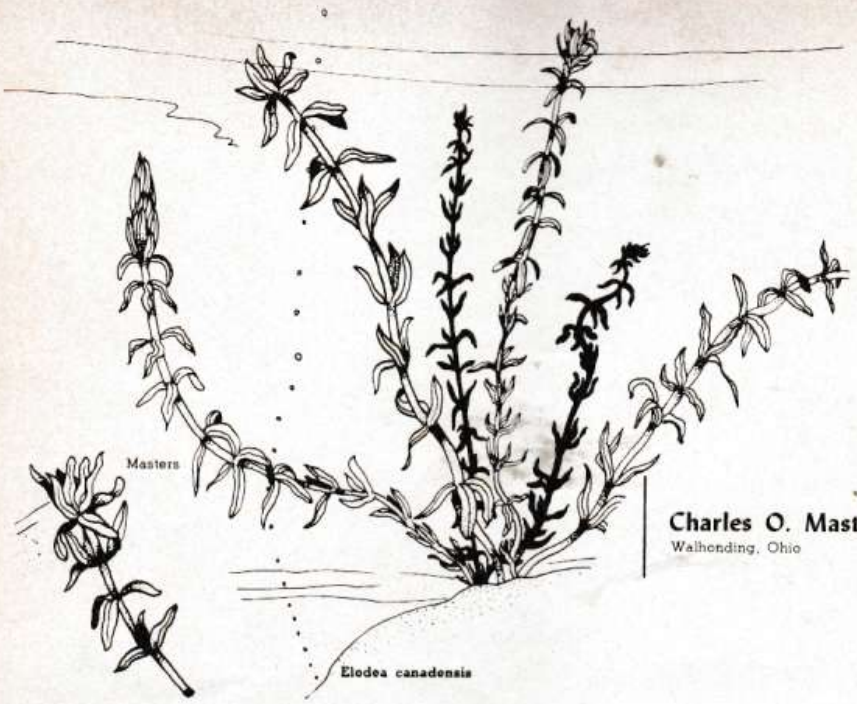
Now available at your favorite pet shop in the U.S., **BiOrell** *will not cloud your aquarium water.*

In order to convince hobbyists of the superiority of **BiOrell** over other fishfoods, Longlife will pay hobbyists 25 cents to try the product! All you have

to do is to purchase a can at your pet store. You'll find a token inside the can, packed at the bottom. Simply send the token, with your name and address, to: **BiOrell**, Longlife Fishfood Products, 50 Cooper Square, New York 3, N. Y., and your 25c will be sent by return mail.

For dealers, Longlife has a special introductory offer of **BiOrell** flake fishfood from West Germany: If the dealer buys a dozen cans, he gets a dozen cans *free* – along with an attractive **BiOrell** counter merchandiser. So, either way – as a hobbyist, or as a dealer, **BiOrell** fishfood is a sound investment in good nutrition for your fish, and wise for your pocketbook, too.

Ask your dealer about this special offer today, or write directly to: **BiOrell**, Longlife Fish Food Products, 50 Cooper Square, New York 3, N. Y. ◄



Charles O. Masters
Walhonding, Ohio

When introduced in England, this prolific American water plant was cursed roundly!

Babington's Curse

As the years go by, more and still more evidence keeps cropping up to clear the name of Charles Cardale Babington, Professor of Botany at Cambridge from May 1861, until his death July 22, 1895. It was approximately in the year 1852, in England, when word first started to get around that Babington, then an instructor at Cambridge, had introduced the American plant *Elodea canadensis,* to the waters of his country five years earlier. It seems the water weed's population exploded everywhere it went. Swimming and boating in most of the parks came to a complete standstill. Even the barge traffic along the water ways was seriously hindered. The government found it expedient to investigate but it did no good. The American waterweed became known as the water pest, then as the choke pondweed, and finally as Babington's curse!

In American waters, even though the plant was well adapted, it was kept under control by other plants such as the stonewort, *Chara,* the tapegrass *Vallisneria,* and common floating plants such as duckweed. At about that time too, the family aquarium hobby was just beginning and these very early aquarists would gather fragments of the plant to place in their cold-water bowls but no word had yet been heard of its spread

(Continued on Page 355)

Here are 32 ways to improve your exhibit when entering a fish show

Show Hints!

Ron Carrow
Omaha, Nebraska

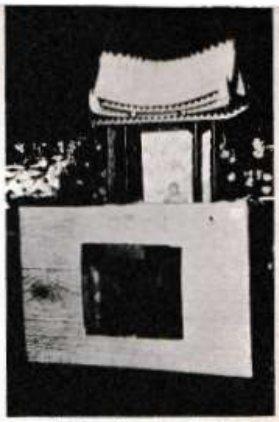


Photo: Novelty shrine tank by Valerie and George Mitchell at the S.F.R.S. Spring Show. It won second place in novelty class.

SHOW JUDGES like to see very well arranged tanks and are quick to take off points for those poorly planned. The following, I hope, will point out some of what judges expect and what might be of general help to competitors in aquarium shows.

1. Read and *understand* the show rules. Any member of the show committee will be glad to clarify any doubtful points.
2. Days before the show, make a list of items needed, so that nothing will be forgotten in the rush of show time. Extra air tubing, chlorine neutralizer, and the like are easy to forget.
3. Mark all equipment with an identifying mark.
4. Clean the tanks to be used, before and after setting up. Note especially a film that appears on the innerglass after the tank has been set up a few hours, and watch for water spots on the frame and reflector.
5. Touch up all spots of rust or corrosion. Repaint entire tank frames if necessary.
6. Show stands supplied by the club are not always absolutely level. Be sure to level tanks before filling.
7. Use, if possible, new well washed and boiled gravel. This avoids initial cloudy water.
8. Gravel in show tanks should be a little deeper than in home tanks. Some hobbyists like a slightly textured surface to their gravel rather than a plain flat surface.
9. In general large tanks are easier to arrange for show than small tanks.
10. Some sort of an external background (Crystal lacquer, colored foil, 3-D backgrounds, etc., but not plain aluminum foil) is a must. [Editor's note: *I am one judge that only likes plain, dark backgrounds.*]
11. Use gravel and background colors that do not hide or clash with the fish shown. A red or orange fish against a red or orange background generally makes a poor showing.
12. If rocks are to be used, 1, 2, or 3 large rocks are generally better looking than a number of small ones.

Photo: Crowds at the California Academy of Sciences, headed for North American Hall and the Show.

Photo: Fish Show sign outside North American Hall. Photos on this page by Richard W. Law.

Don't overcrowd a tank with rocks.

13. Don't use sea shells or coral in freshwater tanks.
14. Don't use artificial decorations (no sunken ships, glass temples, etc.) except where the tank is entered as a novelty tank as may be permitted in show rules of some clubs.
15. Keep comic, and all other signs off tanks at least until after judging.
16. Don't use artificial plants unless the fish shown cannot be kept with live plants.
17. Generally, show plantings should be kept simple with a few large plants or bunches of plants.
18. Trim all plants to remove all brown or broken leaves. Thin plants look better than bushy ones with damaged leaves.
19. Make sure that the roots of all plants are completely covered. Plant anchors help.
20. Don't provide good cover for fish which tend to hide or they won't be seen by the judges. Fill in corners with plants and/or rocks to keep fish out in front.
21. Outside filters take up less space than bottom filters and make a tank easier to arrange properly.
22. Set up tanks a day or so before the fish are to go in, if possible. This gives water temperature time to adjust and water a chance to clear.
23. Make sure that water is sparkling clear at judging time.
24. Change old light bulbs for brighter ones. Bulbs tend to dim with age and produce a dark tank. When using new but slightly used bulbs, clean off any water spots.
25. Remember that show tanks often have a larger fish population than home tanks, but this is not a hard and fast rule. Let the appearance of the tank be your judge.
26. Enter only mature fish where at all possible. Best Family Group entries

PRODUCT NEWS

News About Aquari-sol

The manufacturer asks: "What's so great about Aquari-sol?" And then proceeds to list umpteen reasons why, the first and most important being that Aquari-sol *prevents* "ick." And that Aquari-sol *cures* "ick." That Aquari-sol is extremely effective in curing most causes of "closed fins," body fungus, velvet and "sluggishness." Aquari-sol can also be used as a net dip, a disinfectant for your nets. It works in freshwater aquariums regardless of pH or hardness. Aquari-sol has been tried and proven in this country and Europe before it was introduced to the commercial market. It is being used by the National Aquarium, Washington, D.C. and by the U.S. Bureau of Fish and Wildlife. Remember that Aquari-sol is manufactured for freshwater fish only – do not use in marine tanks. The ¾ ounce size will treat 375 gallons. If your dealer does not handle Aquari-sol, send 50c for a plastic dropper bottle, to: Aquarium Products, 4143 Hayward Ave., Baltimore, Maryland 21215. ◄

CLUB NEWS

Pomona Valley Aquarium Society

This new group was recently formed in Pomona, California, and meets the second Tuesday of each month at 7:30 p.m. at the Washington Park Community Building, corner of Towne Ave. and Grand Ave., Pomona, according to Billie Simpson, Secretary.

Recently elected officers of the P. V. A. S. are: Glen Henderson, President; Lester Parr, Vice President; Billie Simpson, Secretary; and Betty Barr, Treasurer. Board of Directors includes Paul Salado, Charles Smith and Art Fitzwater. ◄

and the like are exceptions. Also if all the fishes are young there will be a better showing than if young of only moderate size were mixed with fully grown fishes.

27. Don't mix normally tough fish with "community" fish. Even if they get along, judges will question such a mixture.
28. When showing species group entries, uniformity is more important than numbers or size. One or two large, colorful fish can cost points in a species group entry of otherwise moderately, but uniformly-sized fish.
29. A tank will do better if malformed, injured, sick, or overly small fishes are left out, even thought the tank may look a little empty.
30. Air conditioned show rooms may get very cold in the day and warm at night when the air conditioner is turned off. A thermostatically controlled heater is necessary for most tanks. A light left on may keep a small tank warm, but watch the temperature closely.
31. Don't feed your fishes the night before judging. This avoids any possible fouling and unsightly uneaten food. Also a slightly hungry fish is more alert and makes a better showing.
32. Leave nothing to chance. One careless slip-up may cause even the best fish not to win. ◀

(Reprinted from "Midwestern Aquarist," Omaha, Nebraska)

Masters

(Continued from Page 352)

Those who were so anxious in 1852, to point an accusing finger at the Cambridge instructor were not aware that ten years earlier *Elodea* was already growing in a quiet pond at Dunse Castle, Berwick, Scotland, from where it was spreading along the length of the Whit-

adder River, fifteen miles to its mouth in the North Sea.

In 1845, the plant was already well established in ponds in the Market Harborough area east of Birmingham, England, from where it spread rapidly all over the English countryside. Evidence indicates that fragments of *Elodea* as well as its seeds could easily have become lodged in cracks of American timber logs floated on the St. Lawrence River prior to shipment wet across the Atlantic.

Several years after the plant was already growing well in parts of England and Scotland, instructor Babington was very much absorbed in his study of the pollination of *Elodea* blossoms and the plant's method of reproducing itself. It was in the year 1847, that the Curator of the Botanical Garden at Cambridge, approached Babington for some of his laboratory plants and was given a few very healthy strands. Some time later, growing fragments were detached and placed in the River Cam by the curator and not by Babington.

After only five years practically every stream and pond in the country was choked, or almost so, with vegetatively produced strands of *Elodea canadensis*. It is an aquatic plant normally living submerged and occasionally drifting about with any water current whether it be the slow movement of a river or the rapid gushing of a flood. Sometimes portions are attached to logs floating downstream and are in these ways dispersed about the country.

British botanists found no evidence that the plant was reproducing itself in a normal sexual manner by the production of seeds but instead by the continual growth vegetatively of the stem and its branches. In this light, the *Elodea* plants throughout all of England were but parts of a very few female individuals introduced into the country.

It is quite probable that the plant was

brought in several times from America, both in timber and as packing material for more desirable aquatic plants such as the sweet-scented, white water lily and several species of *Aponogetons*. In any event, *Elodea* appeared quite often in ponds after the introduction of the more attractive species.

Eventually in 1860, ponds in Belgium, France, and Holland, began to fill up with the water weed and a year later reports came in that *Elodea* had reached Germany and Russia. At about that time too, root stocks and fragments began to serve as part of the material with which Swedish birds made their nests. Fragments of *Elodea* were found twisted about the legs of water fowl as they approached isolated ponds and in this way the plant was introduced into new waters. Tests were made in order to determine about how far a bird could fly before the plant dried up beyond the point where it could revive once more in water. It was decided that a bird flying forty miles per hour could thereby plant the species in water 920 miles away and it could easily survive.

In Edinburgh, Scotland, in 1879, the first male flower of *Elodea* was found and since then the plant has been growing normally as a naturalized citizen of Europe. Fifty years later by the turn of the century, the invading *Elodea* had become rather scarce and now is just holding its own along with the other aquatic plants.

It is interesting to note that still another species of *Elodea*, once more attractive in many respects, has been recently introduced into English waters from South America by aquarists and is already considered a pest in a few localities. Who might eventually be blamed for this? ◄

Letters to The Journal

From: Donald W. Kent
Lake Minchumina, Alaska

I have a problem and I need a little help and advice. I recently purchased two *Corydoras aeneus* for my tank. After two weeks they died. There was no indication of what caused the death on the body of the fish. They just got very "lazy" and that was it. Well, I started a new tank and purchased two *Corydoras aeneus* and after two weeks the same thing is happening. One has already died and the other is on his way out. Both tanks have the following conditions:

1. Hardness 153.9 per million
2. pH approx. 7.0
3. Temperature, 78° night, 82° day
4. One teaspoon salt per 2½ gallons.

(I am raising mollies and our water has no salt content.)

5. Filter okay.

That's all I can think of and I sure will appreciate any help you can give me.

REPLY: From what you say I would guess that your Corydoras *are being poisoned. There are reports that several species of* Corydoras *are sensitive to salt. Are you sure your statement about no salt in your water is correct? The salt content of fresh water varies greatly in different areas. The amount you add may be too much for* Corydoras. *Try some* Corydoras *in a tank without added salt.*

From: Hilda Grace White
P. O. Box 5845
Birmingham, Alabama

I have recently acquired an aquarium and a few interesting fishes and have become quite interested in this as a hobby. Because I am confined to a hospital room my ability to search out sources of information is mainly limited to written correspondence. Could you possibly advise me as to the best ways a beginner can acquire basic literature and information on the raising of these fishes? As I am a registered nurse, I have some knowledge of scientific terminology but this is all I know I am afraid. Any assistance you could give would be greatly appreciated.

REPLY: If you will look in Mr. Klee's book review in this issue, page 335, you will see several books he considers basic to aquarium culture. I agree completely with his choice. These books are still in print and any good aquarium or book dealer should be able to get them for you. Perhaps you have a friend who could help, or one of our readers would be willing to help.

° ° °

From: L. P. Olsen
Montebello, California

Can a grower sell his fish to a pet store without getting a commercial license? I have been trading off with other raisers up to now but I have 500 baby bettas in the nursery tank now and I don't want to expand to 200 gals. I would like to sell them to a pet shop. Can you answer this question?

REPLY: You should investigate local laws and zoning restrictions. Check with your city's ordinances. Ordinarily a small "Hobby Business" such as you would have is not restricted but you should know where you stand in your community laws.

CLUB NEWS

Queens County Aquarium Society

The Annual Tropical Fish Show of the Q.C.A.S. was staged Friday, Saturday and Sunday, June 26, 27 and 28, at the Republican Hall of Astoria, 3127 41st St., Long Island City, N.Y., according to Frank Ciscone, Secretary.

From: Craig A. Montgomery
Roanoke, Virginia

About one year ago, while in a local pet store, I noticed an issue of the *Aquarium Journal*. I subscribed immediately and have been receiving your fine magazine ever since.

While glancing through an old aquarium book, I saw the photograph enclosed.

So far, I haven't been able to find any information about this fish. Could you please tell me if it is still on the market, and if so, where? I would sincerely appreciate any information you could give me.

REPLY: The photo and text you enclose is of the tule perch, Hysterocarpus traski, *native of the fresh waters of Central California. The fish is a kind of a mystery to me. The source you enclose stated the fish has lived for about two years in captivity, a more recent writer, one we all know at Steinhart Aquarium, Dr. Earl S. Herald, states that no one has kept this species alive more than a few weeks. Mr. Robert Lanier, the writer of the old report you sent to us was once curator of Steinhart Aquarium, too. One thing is certain, the tule perch is hard to keep alive. The fish is not on the market and so far as I know never has been. However it may once have been sold for it was reported on many years ago in the "Pennsylvania Fish Culturist," a strictly Eastern publication. I have caught them in the wild, and specimens in good color have considerable yellow on their bodies. The fact that they are* the only *freshwater representatives of a marine family and that they give birth to large, live young of course makes them extremely interesting. If you want any you will have to go to California and catch them. I would not advise it. Chances are remote that you could keep them alive.* ◄

★ IDEAS ★

BY HOBBYISTS

The Journal will pay $5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Styrofoam Feeding Ring

Inexpensive and easily replaced is a feeding ring made from a one inch wide circle cut from the styrofoam plastic drinking cups. They will adhere to the aquarium side, staying over an easy to clean area. Since they float with approximately one quarter inch submerged they also make fine brine shrimp egg "corrals." – *Edwin C. Symmes, Jr., Atlanta, Georgia.*

Klee

(Continued from Page 338)

be to misinform the reader. To continue, then, my choice of tank is either a 3 or 5 gallon stainless steel aquarium, fitted with an inside filter and left with a bare bottom. To this is added either a piece of slate (about 5 x 9 inches) which is leaned against one of the side glasses, or else a flowerpot (or cocoanut shell, three-quarters of one, that is). Frequently, both slate and flowerpot are employed together. The water used is my standard very soft rainwater (I have a cistern) with no regard to pH whatsoever. This is the basic setup, my specific techniques being as follows.

1. Four to five nylon mops (the floating kind, used by the killifish fancier) are added to the tank, followed by the

dwarf cichlid pair. How the pair is added is usually of little importance as long as both are added at the same time. If I am unfamiliar with the species, however, the female is sometimes added first, followed by the male in a day or two. This allows the female (who is smaller and weaker) the advantage of adjusting first.

2. Here is a most critical stage, the stage during which most females are killed. If an aquarist loses a female, it is his own fault and no one else's! Without the mops, the female has little refuge in this small tank. Should the male be a vigorous driver and the female not ready to spawn, she simply will be killed (or else severely damaged). The aquarist should check the tank as frequently as possible. He should especially look for the female, asking the following questions:

(a) Is the female hiding in the mops while the male is in full view?

(b) Are the female's fins torn?

The moment one finds the female out swimming around with the male in apparent harmony, then the next step must be taken. My preferred foods for the parents, incidentally, are shredded beef heart and adult, frozen brine shrimp.

3. A thermostatic-heater combination is now added and the temperature brought up to 80-82° F. Again, the admonitions of step 2 are necessary. When the pair is fully adjusted at this higher temperature (i.e., swimming around together in harmony), all but one of the mops are removed.

4. Now watch your fish. An intensive coloration is a sign of imminent spawning as are concerted "cleaning" and "investigative" actions. Watch for the pre-nuptial play (spreading of fins, jaw-locking, etc.). Look for eggs. However, if a flowerpot is used, you will not always be able to see them unless you disturb the spawning substrate and look inside with a flashlight. This is not rec-

ommended. If the female is in the flowerpot and seems hesitant at coming out. and/or if the male acts aggressively toward you, chances are that there are eggs in the flowerpot. Often, these eggs will be laid on the upper (inside) roof of the pot. In the case of slate, they often are laid close to the bottom of the tank. Cichlids are individuals, however, and they may just ignore all prepared substrates and lay their eggs simply in a corner of the tank!

5. If your fish are fed well but still do not spawn, drop the water level an inch or so and add cool water (70-72° F.) either right from the tap or from new but aged water (the latter preferred). This often stimulates spawning within two days.

6. Assume now that the fish have spawned . . . now comes a decision. Should the male be removed? Should both parents be removed? In *Apistogramma*, generally only the female cares for the aggs. I prefer leaving both parents in the tank until the eggs are just about ready to hatch. In this way, the female worries about the male and foregoes (sometimes!) eating the eggs. As soon as the embryos are well-developed (about 3 days at 80-82° F.), they are out of the most critical fungusing stage. At this point, I remove both parents, mops, inside filter and any other useless equipment. Aeration is maintained, however. More often than not, the pair will eat their eggs and consequently, the next time eggs are laid, both fishes are removed as quickly as possible. Again, all paraphernalia must be removed (except the spawning substrate, of course). At this point I usually add a few cubic centimeters of peat extract and enough acriflavine to color the water a pale yellow. If the parents or even only the female is left with the eggs, I do not add anything.

7. After the fry hatch, absorb their yolk sacs and become free-swimming (3 days or so), I start feedings or brine shrimp nauplii (with a little egg yolk the first few days). In a week to 10 days, I supply a jug filter (a Miracle drum bowl filter, 1 or 2 gallon size, placed into a plastic sandwich container and covered with gravel). This filters the water without the danger of sucking fry into the filter.

The above steps represent my own personal standard techniques. Again, cichlids are individualistic and when I run into trouble I meet it with personalized action. In my 16 years in the hobby, I have failed in breeding dwarf cichlids in my possession but once using these techniques (the exception was

Salt Water Fishes

By Robert P. L. Straughan

Q. — *Do nurse sharks live well in the home aquarium? What do they eat? How large a tank should they have?*

A. — *Nurse sharks live exceptionally well in the aquarium and make interesting pets. They eat fresh shrimp, fish, earthworms and lean beef. Caution: Do not overfeed young specimens as they may regurgitate the food and foul the water. A small shark eight or ten inches should have a fifteen to twenty gallon tank as they grow quite fast. After a couple years, he may need a larger tank.* ◄

CLUB NEWS

Potomac Valley Guppy Club

The Fifth Fall Fish Fair of the P. V. G. C. will be held October 10 and 11, 1964, at the Arma Motel, Arlington, Virginia, according to Elliott R. Tracy, Secretary. ◄

Lamprologus leleupi of which, the less said the better . . . I violated step No. 2!).

Another question I am frequently asked is, "What are the species belonging to the genus *Apistogramma*?" I am not quite sure that anyone knows for certain, but the following partial key might serve as a rough beginning. The "key" does not separate all the species by any means but it will at least give you an idea of the size of the group.

Incomplete Key to Species of Apistogramma

I. Male with Lyretail

A. Length of snout greater than diameter of eye:
   1. *ortmanni* Eigenmann, 1912 - British Guiana, Amazon
   2. *wickleri* Meinken, 1960 - Guianas

B. Length of snout about equal to diameter of eye:
   1. *cacatuoides* Hoedeman, 1951 - Dutch Guiana
   2. *klausewitzi* Meinken, 1962 - Middle Amazon
   3. *ornatipinnis Ahl,* 1936 - British Guiana
   4. *sweklesi* Meinken, 1961 - Peruvian Amazon
   5. *trifasciatus trifasciatus* Eigenmann & Kennedy, 1903 - Matto Grosso, Brazil
   6. *trifasciatus maciliense* Haseman, 1911 - Middle Amazon

C. Length of snout shorter than diameter of eye:
   1. *borelli Regan,* 1906 - Parana, Gran Chaco, Matto Grosso
   2. *ritense Raseman,* 1911 - Parana, Paraguay

II. Male with Rounded Tail

A. Length of snout about equal to diameter of eye:
   1. *ambloplitoides* Fowler, 1939 - Peruvian Amazon
   2. *steindachneri* Regan, 1908 - Demerara, British Guiana

B. Length of snout less than diameter of eye:

   (a) Dorsal rays of male not prolonged:
   1. *aequipinnis* Ahl, 1928 - La Plata
   2. *amoenus* Cope, 1872 - Ambyiacu & La Plata
   3. *commbrae* Regan, 1906 - Paraguay, Matto Grosso
   4. *pertence* Haseman, 1911 - Middle Amazon, Rio Tapajoz
   5. *pleurotaenia* Regan, 1901 - La Plata, Paraguay
   6. *reitzigi* Ahl, 1939 - Middle & Upper Amazon, Paraguay

   (b) Dorsal rays of male prolonged:
   1. *ramiriezi* Myers & Harry - Rio Meta, Apure
   2. parva Ahl, 1931 - Lower Amazon, Paraguay
   3. *taeniatum* Guenther, 1862 - Amazon to Paraguay

III. Male with Pintail

A. Dorsal rays not prolonged:
   1. *agassizi* Steindachner, 1875 - Amazon to Parana and Paraguay

B. Anterior dorsal rays prolonged:
   1. *weisei* Ahl, 1935 - Middle Amazon

It is hoped that many of these fishes can be described in detail in future articles. ◄

CLUB NEWS

Stanislaus Aquarium Society

Modesto will become the center of attraction for tropical fish enthusiasts when the S.A.S. plays host for the Fourth Annual Tropical Fish Show on Saturday and Sunday, June 13 and 14. The show, which is alleged the largest in the state, is expected to attract exhibitors from all over the state.

Display hours will be from noon to 10 p.m. on Saturday, and 10 a.m. to 6 p.m. on Sunday, at Lyng's Pet and Garden Center, north Highway 99, Modesto, according to Dr. James A. Porter, publicity chairman. Admission is free. ◄