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THE GREAT CURATOR SWAP

aquarium journal

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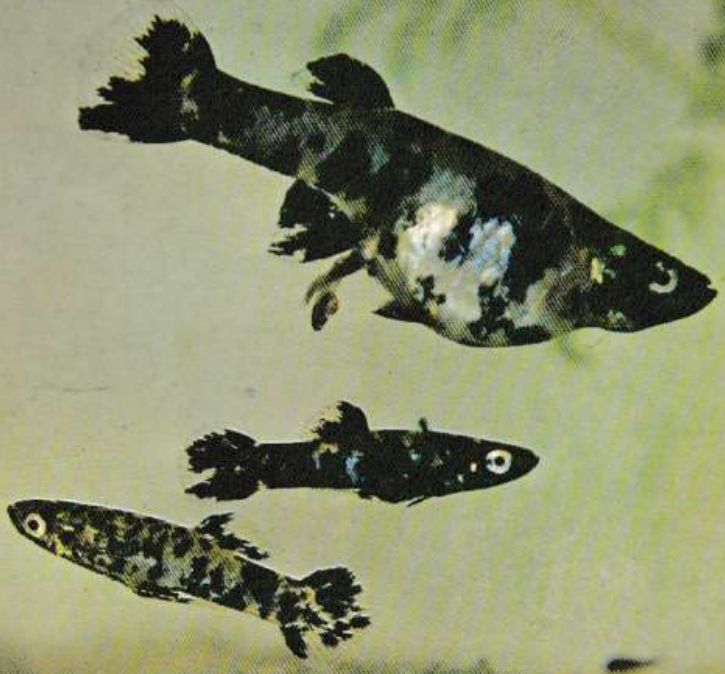

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contents

cover photograph

Two male and a female Gambusia affinis. *The female is dropping young. Regarding the photo, the photographer, Gene Wolfsheimer, F.A.I., says: "These fish were collected in Florida by a young member of the Los Angeles Aquarium Society and given to me."*

Ever thought of swapping jobs with someone in a different part of the world?

The Great Curator Swap

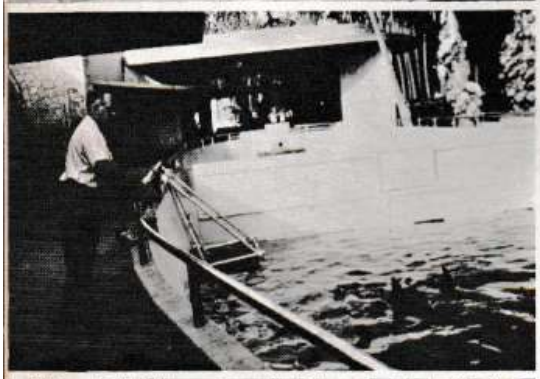
Diane Schofield
Burbank, California

Photos: (Top) Spencer Tinker, curator of the Waikiki Aquarium in Hawaii, who traded jobs temporarily with Louis S. Mowbray **(Left)**, curator of the Bermuda Aquarium. Photos in article by the author unless otherwise credited.

When suddenly confronted by the curator of the Bermuda Aquarium, I thought, "Good heavens, I've got the wrong ocean!" For there before me stood Spencer Tinker, who normally does his curatoring in the Waikiki Aquarium in Honolulu. He exclaimed with a surprise that matched my own, "I know you!" I had to admit that I knew him too, and true, whenever I was in Honolulu I did drop in on him to see what was cooking out at his "fish city." But this time didn't he take the wrong turn somewhere, say back at the Panama Canal?

So thus unfolded his story. A tale in which two men exchanged jobs, houses and cars. The only place where they drew the line was in swapping wives. This was for the period of September, 1963 to June of 1964 to give their respective offsprings an uninterrupted school year. To this day these two men have never laid eyes on one another.

It all started back in 1960 when Spencer Tinker paid a visit to the Bermuda Aquarium on his way to a conference of ichthyologists at Monaco. At that time, Louis S. Mowbray, the regular curator of this aquarium, was in Miami. Liking what he saw, Mr. Tinker sat down and drafted a plan in



a letter to Mr. Mowbray. Would he care to switch around for a while, thus giving both of them a chance to work on new projects in a new atmosphere and with fresh associates? Mr. Mowbray would. So to make a minimum upheaval in the lives of both, they merely moved into each other's house and used the car that belonged to the other.

This move took a bit of adjustment, even though it was but a long jump from one tropical isle to another. Bermuda is technically a tropical island, but it really does not resemble our usual concept of a tropical island. Bermuda is only 22 miles long with a land surface of 21 square miles. It is on a section called "Flatts" that the Bermuda Aquarium is located.

This aquarium was built in 1926, but didn't open until February 1, 1928 because of a general strike in England that prevented the reception of glass for the front of the tanks. On the day of opening, Louis S. Mowbray was the assistant Curator. Later after the death of his father, Louis L. Mowbray, in 1945, he became curator.

Louis Leon Mowbray was a remarkable man. During his lifetime he was responsible for four large aquaria: Miami Beach; Boston; Agars Island, Bermuda; and the current one at Flatts. He also served for 15 years as the superintendent of the New York Aquarium.

Incidentally, the aquarium at Agars Island probably was one of the most unique public aquariums ever to exist. It was built inside of an old underground British powder magazine. This had a central hallway with side halls radiating out at angles from it to minimize the results of a possible explosion. The senior Mr. Mowbray cut skylights

Photos: (Top) Pool for turtles and spinning porpoises at the Waikiki Aquarium; **(2nd)** Mr. Mowbray feeding spinning porpoises at Waikiki Aquarium; **(3rd)** The collecting boat for the Bermuda Aquarium; **(Bottom)** Museum that is a part of the Bermuda Aquarium.

to the outside so that the tanks were illuminated with natural daylight. Small boats brought the public over to this tiny island to admire the fishes in these tanks. It lasted until almost the beginning of the first World War which saw the aquarium once more with powder instead of fish inside.

After learning of this unusual public aquarium, Spencer Tinker had to see for himself what it might have been like and what, if anything, was left of it. Utilizing the aquarium's collecting boat, he paid Agars Island a visit. All of the subterranean passages were still there but with only ghostly memories of its once wet inhabitants.

With a father, who had this imposing background that revolved around public "fish houses," it would have been strange indeed had Louis S. Mowbray followed any career other than that of a "fish housekeeper." He spent many years assisting his father, first in one of his aquariums and then another. Nevertheless, one of the first loves of his life is catching fishes on rod and reel, and not catching them for his aquarium by net.

In their environment, both curators started projects aimed at improving the respective aquariums, projects that would live on after each one had gone back to his own stamping grounds. Mr. Mowbray was instrumental in bringing the first spinning porpoises to the large pool outside of the Waikiki Aquarium. These porpoises are so called because when they leap into the air, they often whirl around smartly like big wet tops before landing once again back into the water. The addition of the porpoises was made possible through the cooperation of David Brown, curator of mammals at Marineland of the Pacific.

Another project which Mr. Mowbray had in mind and which never saw fruition was a ramp-like addition to the green turtle pool so that they could

Photo: Exterior of the Waikiki Aquarium, bailiwick of Spencer Tinker.

reach the beach, via a runway, and spawn in the sand. As it is, frustration runs rampant in the Waikiki Aquarium turtle pool. Females try their best to reach the beach for their egg-laying chore but end up with hard concrete.

Mr. Tinker chose to do work on turtles too, as part of a new project. He arranged to have a better enclosure for those on display in the Bermuda Aquarium. He also worked on the better displaying and photographing of an unusual and very valuable exhibit in the museum that is a part of the aquarium. This exhibit is what is known as The Tucker Treasure. In the era between 1593 and 1595, a Spanish ship en route to Europe from the New World was wrecked on Bermuda's outer reefs, nine miles from shore in 30 feet of water. Recently this wreck was discovered by Teddy Tucker and Bob

Photos: (Top) The Bermuda Aquarium, headquarters of Louis S. Mowbray, Curator. **(Right)** Portrait of Curator Mowbray's father, Louis Leon Mowbray, which hangs in the museum at the Bermuda Aquarium.

Canton. From the remains of this galleon they took cannon, solid gold jewelry, Carib spears, navigating instruments and dishes. Not too long ago, both *Life* and *Saturday Evening Post* ran feature articles on this treasure and Mr. Tucker. Some of the items, such as the emerald encrusted golden cross, are considered to be one of the most valuable treasures ever taken from the sea in the Western Hemisphere.

Asked how the two aquaria compare, Mr. Tinker said, "The two are similar, except that the one in Bermuda has tanks that are 3 to 4 times larger than the one in Waikiki so that they can display larger fish." While on the other ocean, Mr. Mowbray reported, "The fish exhibited in the two aquariums are about the same except for color. The Atlantic has the same types from the same families."

Another point of variance is that 90% of the admissions of the Bermuda Aquarium comes from adult tourists, since the aquarium is a part of one of the main sightseeing tours of the isalnd. The Waikiki Aquarium has only 75% tourist trade since tourists get there on their own. Tuesdays and Thursdays are the biggest days, since there are the times that the Kodak Hula Show is held and this is only a short distance from the aquarium. Tourists returning to their hotels, often stop and view the aquarium.

The Waikiki Aquarium draws on the average of 250,000 people, while 100,000 see the Bermuda Aquarium annually. The admission, however, for the aquarium in the Atlantic is just double that of the one in the Pacific – 50c (or 3 shillings 6 pence). The Bermuda Aquarium is administered by the Department of Agriculture and Fisheries

Photos: (Top) Moray eel in gregarious mood at the Bermuda Aquarium; **(2nd)** Inside of the museum at Bermuda Aquarium; **(3rd)** Part of the Tucker Treasure, showing the emerald and gold cross in the center. **(Right)** Strolling turtles at the Bermuda Aquarium.

while the Waikiki Aquarium is operated by the University of Hawaii.

Oddly enough these two curators who have never met are similar in age and appearance. Both are handsome graying men. As a matter of fact while he was walking along the street one day, Mr. Tinker reported that a woman ran up behind him and exclaimed, "Oh, I didn't know you were back yet!" When I related this incident to Mr. Mowbray a month later when I visited him in his adopted Hawaiian atmosphere, he said with a twinkle in his eye, "Well, I hope it turned out to be interesting for him!" ◄

Fatally-drugged fish sometimes arrive in apparently good shape — but beware!

Over-Drugging Marine Fish

Robert P. L. Straughan
Marine Collector
Coconut Grove, Florida

THE USE of "sleep drugs" in transporting or shipping salt water fishes throughout the world should be studied with a critical eye by the final recipient of the fish. There is continuing evidence that the drugs which tranquilize or put to sleep completely, fish in transit, very often do permanent damage to the fish. Unfortunately the damage does not appear for a week or two so that the middle man handling the fish often gets by unscathed with little loss while the end receiver of the fishes, the dealer or the hobbyist may suddenly find his entire shipment of fish dying in wholesale lots and often absolutely nothing can save them!

The villain in this instance may be either the drug or the improper use of the drug, but either way, once the damage is done, the fish are doomed. Since there are many "sleep drug" formulas on the market and since most shippers do not divulge the name of the particular brand they use, it is impossible at present to put the blame on any specific product but at this point, dealers who suffer substantial losses with their salt water fishes, especially when the fish appear in fine condition, should question their source.

A typical shipment of fatally drugged fishes usually arrives in apparent good condition. They look healthy and fat and after they have been placed in aquariums, they swim vigorously about and the receiver feels confident that he

CLUB NEWS

Northeastern Indiana Aquarium Society, Inc.
(Fort Wayne, Ind.)

The N.I.A.S. will present its Sixth Annual Tropical Fish Show on Nov. 14 and 15 at the West Creghton Ave. Christian Church, 845 West Creghton Ave., Fort Wayne, Ind. Inquiries concerning rules and entry blanks should be directed to the show chairman, Miss Sandra Dentzer, 1655 Third St., Fort Wayne, Ind.

has brought in a good shipment. However, after a week or so, the fishes will begin to die one by one or several dozen at a time. Water changes, filter cleaning, disease remedies, etc. all will be of no avail for the fish are doomed. They are victims of drug poisoning and chances are that although they may have swam about normally for a few days, some of their vital organs, perhaps their liver or even their brain, have been damaged beyond repair.

"Sleep drugs" are most commonly used in shipping to reduce freight rates, especially from overseas and the idea behind them is that fishes may be crowded many times over the normal shipping capacity of un-drugged shipments. But is the savings in freight worth it if the end result is total loss to the dealer or hobbyist? What good are cheap rates and cheap fishes if they do not survive? Drug poisoned fishes usually cannot be saved even with the most expert care and with the most optimum conditions. In fact, fish fatally poisoned would die even if returned to the coral reefs from which they were obtained.

It is most distressing to see beautiful giant angelfish, butterflyfish or spectacular lionfish which have been poisoned by overcrowding in drugged water. The fish may be in perfect color but its eyes will be dull. It will hover in a corner, moving only when prodded. It will show no interest in food and will gradually waste away and die. It is a shame that after so much effort has been expended in capturing the fish, bringing it to a holding station and then shipping it half way around the world, that the fish must die even after arriving alive at its destination.

Perhaps we should go back a dozen years when clownfish were shipped in pure, fresh sea water. What was the mortality then? It didn't compare with today. Many aquarists kept common clownfish for years. Today it may be another story. Unless your shipment was lucky, you are apt to feel that marine fishes are not very hardy. You may place the blame on your artificial sea water, your aquarium cement, *Oodinium* or just plain mis-handling of the fishes, but perhaps it wasn't your fault at all.

CLUB NEWS

Louisville Tropical Fish Fanciers

The L.T.F.F. are featuring a one-day guppy show along with their 8-day tropical fish show Oct. 4-11, 1964, at The Mall, Shelbyville Rd. and Waterson Expressway, Louisville, Kentucky, according to Marion Hayley, corresponding secretary. The guppy show will be open to the public and the guppies will be judged by A.G.A. standards. Date of the guppy show is Sunday Oct. 4, Mrs. Hayley said. For more information, write Mrs. Hayley at 122 Dorchester Rd., Anchorage, Ky. ◄

If the fish were over-drugged, little or nothing you could do would have saved them. They were moribund when you opened the shipping box.

In all fairness I cannot say that all drugs are no good as regards to shipping large quantities of fishes but I can say that many losses of marine fishes appear to be due to the combination of overcrowding and drugging the fishes. I am convinced that it does permanent harm to the fishes in many instances, and I would recommend that dealers and jobbers request that a few boxes of their fishes be shipped in uncrowded conditions *without drugs* so that they may better evaluate sedated fishes. One such shipment of course would tell little or nothing as there are so many variables involved but if after a dozen shipments, the undrugged fishes consistently live better and longer for the customers than the drugged fishes, the evidence would point to the cause. It is better to spend money in freight than have your fishes die prematurely. I feel an evaluation of drugged fish in relation to survival of transported fishes is in order. ◄

These are real jumpers — and grow up to two feet long in nature!

Leporinus nigrotaeniatus

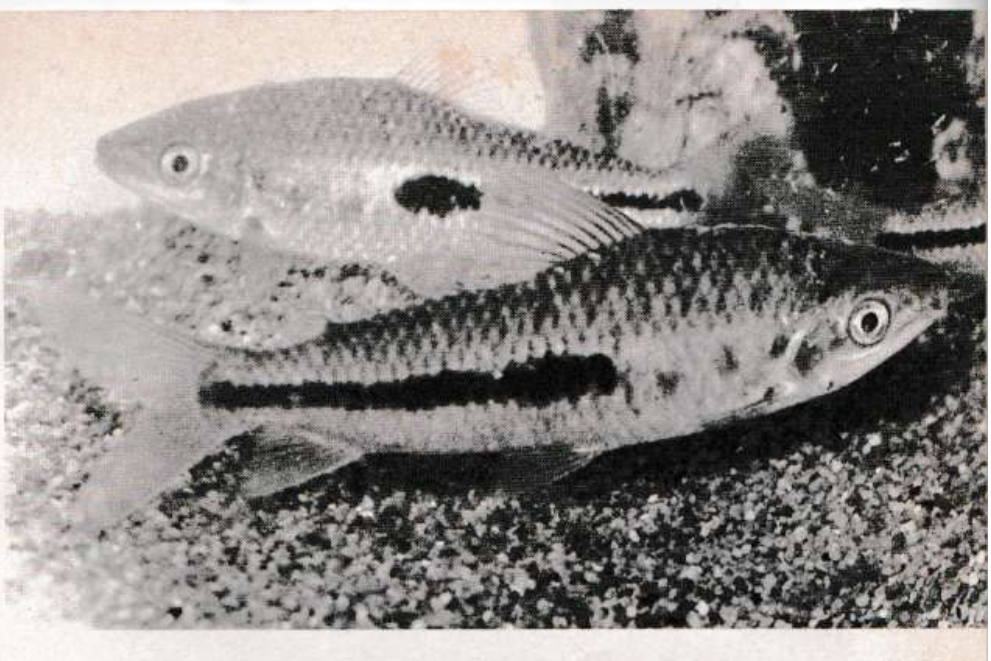
Braz Walker
Waco, Texas

THE SOUTH AMERICAN characins include a number of torpedo or cigar-shaped fishes which are among the showiest of aquarium inhabitants. They range in size from the tiny *Nannostomus marginatus* to some of the larger members of the genus *Leporinus* which often grow to a length of as much as two feet in nature. Like the golden "Dorado," another characin whose fantastic aerial display after being hooked has made him perhaps South America's most fabulous game fish, most of these are excellent jumpers. The Dorado (*Salminus*) is trout-like in appearance and gets larger than two feet. The species of *Leporinus* are especially skillful and utilize their ability to avoid the nets of collectors.

Several years ago I obtained a number of specimens of *Leporinus* which were somewhat similar to *Leporinus frederici* but instead of the spots of *frederici* it was adorned by a lateral band beginning under the dorsal fin and extending all the way to the caudal fin. The fish ranged from four to six inches in length and were a beige color with a faint hint of metallic green when sunlight reflected from their sides. The adipose fin had an orange center and a dark edge.

The fish turned out to be *Leporinus nigrotaeniatus* (Schomburgk). This fish, like *L. frederici* has a heavier, slightly more compressed body, than the more familiar *Leporinus fasciatus* which has been an aquarium favorite for over 30 years. If my color description of this fish gives the impression that *Leporinus nigrotaeniatus* is drab in appearance it is misleading. Actually this is one of the more striking members of the genus.

The species of *Leporinus* are reputed to be "head-standers." This characteristic is true to a certain extent but in my experience with four separate species the head-standing is more apparent when



the fishes are a bit too crowded for their complete comfort. *Leporinus* are large fishes which need abundant feeding and spacious quarters. Although their hardy nature will keep them alive under almost any but the worst aquarium conditions, they remain nervous and are easily frightened unless they have plenty of free swimming space. They are largely vegetarian and quantities of lettuce or spinach as well as occasional feedings of algae, if available, are essential if they are to be kept in top condition.

Unfortunately, like the other members of this genus, *Leporinus nigrotaeniatus* becomes rather aggressive as his size increases, and although the tiny mouth is not likely to engulf any of his tankmates, this *Leporinus*, like the others, is a "Till Eulenspiegel" type of character who enjoys nipping others. At any rate it likes a meal of fins. Although they are very outstanding show fish, because of this prankishness they usually end up like the Boll Weevil in the familiar folk song "just lookin' for a home."

Photo: Leporinus nigrotaeniatus, as photographed by Braz Walker.

Footnote: "Till Eulenspiegel" was a practical joker of German folklore and was the subject of a tone poem by Richard Strauss. One of his pranks resulted in his being hanged. ◄

★ IDEAS ★
BY HOBBYISTS

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

Tank Divider

I recently needed a tank divider for a short time. Therefore, I did not want to go to the expense of buying one. For this I purchased a yard of nylon netting and a number of kite sticks. I made a frame out of the kite sticks, to fit the tank, and tied the netting on the frame with fishing line. The holes let the water circulate freely without the addition of another filter. It also allows one heater to heat the entire tank evenly. This net provides a very inexpensive temporary divider. — *Dayle Ober, Gresham, Oregon* ◄

PART II

An interesting fish worth your while —
can be bred without too much difficulty

Cynolebias whitei

Dorothy O'Quinn
East Point, Georgia

SOMETIMES, as you watch, a strange thing will happen. The dots on the sides of the body will fade away and the body will take on a series of slanting vertical lines or bars. These bars are even more prominent on the female, and often much darker. Her fins are more transparent; her dorsal and anal fins, less pointed. Her sprinkle of dots is only a suggestion. She has two black spots on each side of the body, and sometimes two at the base of the tail, which the male does not have at all. They show up at such an early age, the sexes can be easily determined when the fish are quite small. When grown, the female is much smaller than the male – hardly more than half his size, I would say, which makes them look like an odd pair.

Being bottom spawners, their breeding habits are similar to those of various species of *Nothobranchius*, and other species of *Cynolebias*. They spawn readily, and will often spawn when they are only six weeks old.

There are a number of methods used for spawning this group of fishes, but the easiest method for me is to put a small plastic sandwich box filled with boiled peat moss in one end of a bare bottom tank, and fill the tank about half full of soft water. An air stone in the opposite end of the tank from the box of moss helps to keep the water clear. A cover should be kept over the top of the tank, and the light should be subdued. The water may be neutral or slightly acid, and the temperature may range between 72 and 75 degrees F.

I use two females and one male, but a single pair is satisfactory. I feed them only live or frozen food while they are in the breeding tank, and leave them there for about two weeks. At the end of this time, I remove the box of moss, drain off as much of the water as I can and place it on a lower shelf, uncovered, for two or three days. This will let the excess water evaporate. The moss should be damp, but not soggy. I then cover the box, label and date it. (Plastic sand-

wich boxes have covers that fit tight and retain moisture.) Sometimes, if the water does not look cloudy, I give the breeders a new box of moss, and they will continue spawning.

In about eight weeks I uncover and submerge the box of moss in two or three inches of aged soft water in a small tank, and add a few drops of a prepared liquid fry food. This seems to help the eggs to hatch. The eggs are not long in hatching, and the babies can take newly hatched brine shrimp almost immediately. I add an air stone after the babies are swimming about. They grow fast, and begin to shape up very early, which makes them interesting to work with; they eat heartily, which is always gratifying. They are not as susceptible to "velvet" as the various species *Nothobranchius* – another point in their favor.

One of the nice things about working with the bottom spawners is that the incubation period is flexible and the eggs may be hatched at a convenient time for the aquarist. I consider eight weeks a good average time, but I have hatched them in less, and I have kept them longer with good results.

From my observation, *Cynolebias whitei* are congenial fish. I have kept them with several other killies and there seemed to be no trouble among them. I have also kept them with an assortment of tetras with apparently no trouble, except they had a tendency to hide. It may be that they would be tempted to take a bite out of a fluttery guppy tail – I have not kept them with guppies.

They can be kept in an outdoor pool in the summer, and they grow well outside. Often in the summer I put my killifishes out when they are only two or three weeks old, and when I bring them in, I have fine specimens. They may be put out earlier than many of the other fishes, as they can stand a lower temperature than some.

I would recommend *Cynolebias whitei* to any aquarist, especially the killifish lover. They may not be readily available, but if you get a chance at them, don't pass them up. Let them show you what they can do for you and I believe you will be glad you did. ◄

★ IDEAS ★
BY HOBBYISTS

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

Hard Plastic Tubing

I have an idea which may help some aquarists. Sometimes it is difficult to push the plastic tubing over valve lead-ins or filter stems, etc. To remedy this situation place the tip of the tubing in hot water until soft and rubbery, then place it over the valve or the filter stem. – *Lea Penta, Brooklyn, N.Y.* ◄

"I think you should turn that vibrator pump down a little!"

Albert J. Klee

looks

• Under the Cover Glass

I DON'T KNOW how many other hobbyists have had the same difficulty as I have experienced, viz., sorting out all of the varieties, forms, names, types, etc. of fancy goldfish that have been mentioned in the literature, but I can state that the confusion slowed me down some! The purpose of this month's column is to save those of you who have not yet gone through this ordeal, time and trouble in future reference. The following describes the major varieties of goldfish and in addition, provides an index whereby any unfamiliar name may be linked up with the proper type. I have selected among synonyms to represent a given type, what I have considered to be the name most used by American hobbyists (synonyms are given alphabetically in parentheses). The terms "metallic," "nacreous" and "matte" refer to the amount (and form)

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wakin	J
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watonai	L
wild	A
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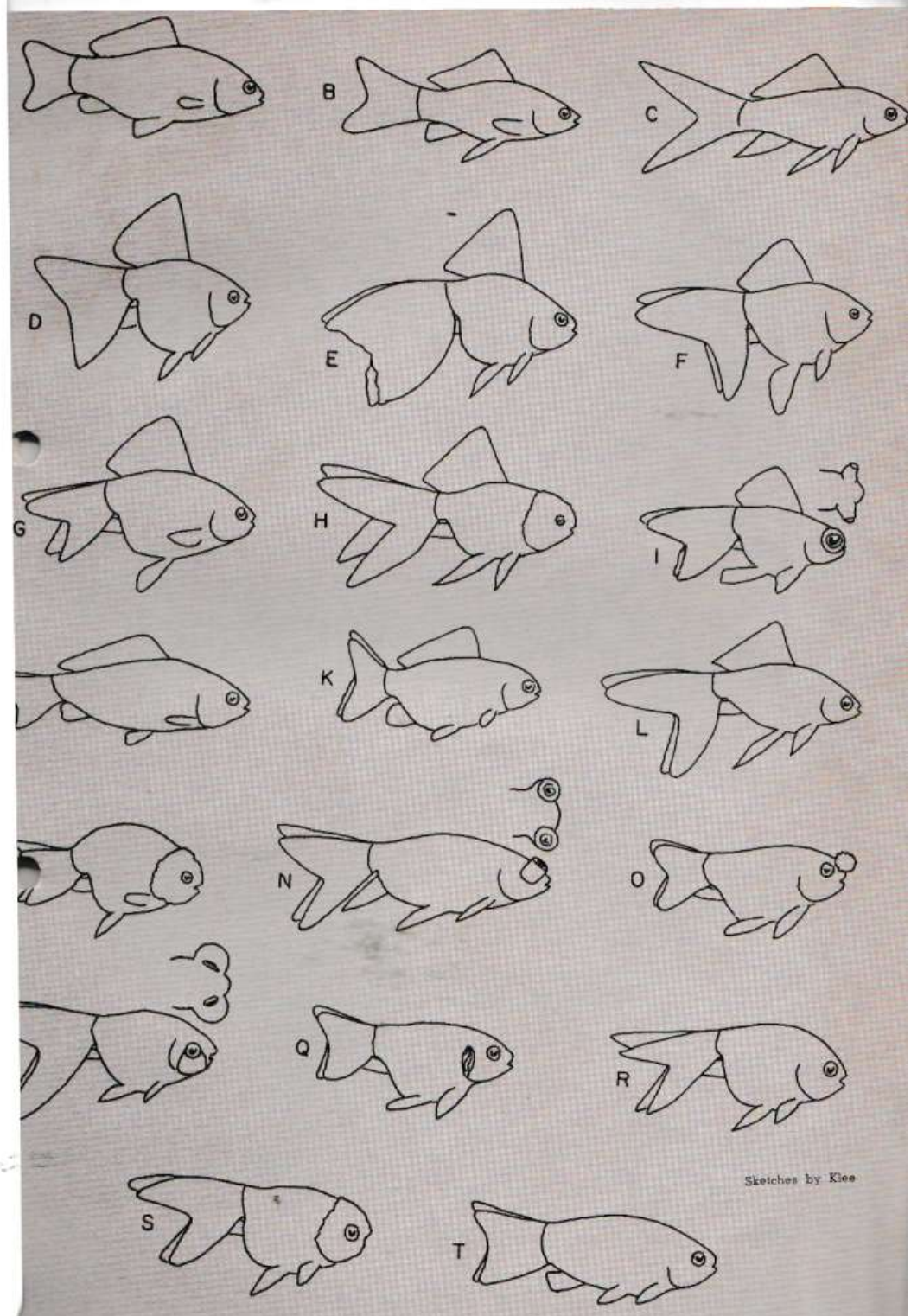


Major Goldfish Types

of guanine crystals present in the skin of the fish, in decreasing order respectively (metallic = shiny appearance, nacreous = mother-of-pearl appearance, matte = dull appearance). I have no doubt that the list is incomplete but at least, it should serve as a starting point for serious study. Additions or corrections would be welcomed.

Category I
Single-Tailed Goldfish

TYPE A: *Common* (chinyu, hibuna, wild). This is basically a xanthic mutation of the wild fish, the term "wild" as its name being decidedly incorrect.

TYPE B: *Shubunkin*. Similar to common with longer fins, but has nacreous form of reflecting tissue. A very common fish. Both nacreous and matte forms of the common goldfish are also known as the *London shubunkin*. A similar fish with shorter fins is known as the *singletail*. A comet-like shubunkin but with somewhat shorter fins than the comet is known as the *Bristol shubunkin*.

TYPE C: *Comet* (tatsugyo). Body similar to common with long and pointed fins, anal and tail fins single.

TYPE D: *Nymph*. Body short and deep, fins long, anal and tail fins single.

Category II
Doubletailed Goldfish with Dorsal Fin

TYPE E: *Veiltail* (liuken, loochoo, nagasaki, onaga, rukin, ryukin, twintail). Body short and deep, anal and tail fins paired, fins long. The nacreous type is known as the *calico* (synonyms azumanishiki, kyariko, nacreous twintail). The metallic type with wild-type coloring is known as the *tetsuwonage*.

TYPE F: *Fantail*. Body short and deep, fins moderately long, anal and tail fins paired.

TYPE G: *Pearl-scale*. Body short and deep, fins moderately long, anal and tail fins paired, scales convex forming ridges in skin parallel to lateral line (fish appears "bumpy" or corrugated). A type with very slightly curved scales is known as *hammered-scale*.

TYPE H: *Oranda* (oranda shishigashira, shau sing tau, tigerhead). Body short and deep, fins long, anal and tail fins paired, head with hood. If the hood is confined to the sides of the head it is known as a *hiroshima;* if confined to the top of the head it is known as a *goosehead* (which conflicts partially in terminology with that of the lionhead).

TYPE I: *Telescope* (demekin, dragoneye, globe eye, lungchingyu, popeye). Body short and deep, fins moderately long, anal and tail fins paired, eyes large and project sideways. The metallic black type is known as a *moor* (synonym kuro-demekin); the metallic orange type is known as *sanshoku-demekin*.

TYPE J: *Wakin*. Like common but with paired tail fin.

TYPE K: *Jikin* (ji-kingyo, jio, kujaku, shachi). Body deep and moderately long, fins short, anal and tail fins paired with four lobes of fins forming an X when viewed from the rear.

TYPE L: *Watonai*. Body long and slim, fins long, anal and tail fins paired.

Category III
Doubletailed Goldfish Without Dorsal Fin

TYPE M: *Lionhead* (bramblehead, buffalohead, chosen, korean, maruko, ranchu, she-tau, shishigashira-ranchu, tigerhead). Body short and deep, fins short, dorsal fin absent, anal and tail fins paired, head with growth (hood) giving produced and rough appearance. When the hood is confined to the top of the head it is known as a *tokin* (synonym goosehead); when confined to the region below the eye and over the gill covers, it is known as an *okame;* when the hood is absent it is known as a *nankin* (synonym osaka-ranchu).

TYPE N: *Celestial* (celestial eye, celestial telescope, demi-ranchu, skyward eye, stargazer). Body long, fins longer than wild type, dorsal fin absent, anal and tail fins paired, eyes large and project upwards. A variety without upturned eyes is known as *chotengan.*

TYPE O: *Pompom* (hanafusa, narial boquet, velvet head). Body and fins short, anal and tail fins paired, dorsal fin absent, nasal septa enlarged to form pompons.

TYPE P: *Bubble-eye* (water-bubble eye) — Body and fins short, anal and tail fins paired, dorsal fin absent, fluid-filled sac projects mainly from underneath eye.

TYPE Q: *Puffy-gills* (outfolded operculeum). Body short and deep, fins short, anal and tail fins paired, dorsal fin absent, posterior margin of each gill cover folded outwards.

TYPE R: *Eggfish* (phoenix egg, yatan-yu). Body short and deep, dorsal fin absent, anal and tail fins paired).

TYPE S: *Shukin*. Body short and deep, fins long, dorsal fin absent, anal and tail fins paired, head with hood. A derived type produced by crossing an oranda with a lionhead.

TYPE T: *Kinranshi*. Body like common, fins short, dorsal fin absent, anal and tail fins paired. A derived type produced by crossing a veiltail with a lionhead.

It might be added that there are many possibilities for combining characteristics of the types listed .For example, telescopic veiltails or calico fantails are not unknown. The term "calico" originally included any goldfish that was not metallic but nowadays mostly refers to the nacreous form (veiltail especially). In view of the confusion still existing in terminology, it would be an excellent step forward should the National Goldfish Society attempt to standardize these names. ◄

• • •

Pomona Valley Aquarium Society

This new club is doing very nicely, with 53 active members. They have had four regular meetings and also a picnic, plus a field trip to Scripps Institution of Oceanography in La Jolla, according to Billie Simpson, secretary of the group. ◄

FINNY FOLKS

By Diane Schofield

A FUNNY THING happened to me on my way out of the Princess Kaiulani Hotel in Hawaii. Somebody screamed, "Diane!" Now often during my lifetime, it has occurred to me that I don't have an exclusive right to this name and besides, who in the world did I know that well in Waikiki? But there, sandwiched between red hair and a brightly colored muu-muu was a very familiar face – a face that belonged to Mary Doughty. Now I knew that Mary and her husband, Jim, were on a buying trip to the Orient, but I didn't realize that we were going to converge upon Hawaii at the same time.

Jim and Mary own J & M Enterprises of Glendale, California, an establishment of great size that deals in practically everything that crawls, walks, jumps, hops or slithers along. They also deal in a great many things that swim too. A part of their business is devoted to one very large tropical fish room. It is to keep their stock filled with all sorts of fascinating fauna that they take to the Orient once a year.

One spot that they visit in the Far East is the hatchery of Somphongs Leharee that is just out of Bangkok, Thailand. This is the outstanding collector of tropical fish who has had three different fishes named after him, *Tetraodon somphongsi* (commonly called the "red-eye puffer"), *Rasbora somphongsi* and a barb, *Puntius somphongsi*. Somphons is, incidentally, the gentleman's first name and not his last.

On the Doughty's last trip to visit him, Mr. Lek-aree gave Jim a very large fish. This fish has been given the rather appropriate name of "Fire Eel," since its body is a charcoal black with fiery red markings. It hasn't been properly identified as yet, but is a form of *Mastacembelus*. They are very scarce, even in Thailand and Mr. Leh-aree gives the few that he finds to special friends.

• • •

The manager of the fish department of J & M Enterprises is a man who has a name that sounds like a command, Reed Forward. Reed is an interior decorator, but he limits his work to only the inside of aquaria. Reed produces startlingly different arrangements for Jim and Mary. For example just before the 4th of July, Jim said, "Let's have something a little different!" So Reed sat down for four hours, surrounded by

Photos: (Top) Jim and Mary Doughty, owners of J & M Enterprises. **(Below)** Jiro Matsui of Hawaii, dressed like a Mainlander.

several sacks of colored aquarium gravel, cardboard and glue. When he was finished, he had a huge American Flag that when placed behind a large tank looked as if it were waving. As citizens of this tank, he added a whole school of small tinfoil barbs *(Barbus schwanenfeldi)* to flash their silvery sides and wave their red, black and silver dorsal fins. This was as near as they could come to red, white and blue.

* * *

Life is full of unusual occurrences and coincidences, another connected with J & M Enterprises: I walked in their front door one day, to have Mary grab my arm and whisper in a conspiratorial tone of voice, "Do you know Jiro Matsui?" I had to admit that I did, but the last time that I had seen him was on one of my shop-hopping binges in Hawaii and had visited him in his Honolulu Aquarium and Pet Supply. "Well," she said triumphantly, "there he is over there!"

And so he was, looking a bit more subdued and different in his conventional "mainland" attire instead of his usual garb of an "aloha" shirt. Mr. Matsui was just freshly back from attending the APPMA (American Pet Products Mfg. Assn.) and the NAPI (National Assn. of Pet Industries) shows in the east. But no matter what his garb, Mr. Matsui is a most remarkable figure in not only the tropical fish hobby, but in the one that pertains to goldfish and carp as well. Listening to him talk is like reading a book on the subject that you wish had been written. This is a well versed subject with him since he has been addicted to fish since he was four, although he did forsake them to study law in college. Arid law tomes couldn't compete with the flash of a golden tail and as soon as he got out of the service after the second World War, native Hawaiian born Jim Matsui went into the fish business.

He now owns not only the Honolulu Aquarium and Pet Supply and Birdland (which contrary to its name is mainly tropical fish, goldfish and carp) in the Ala Moana shopping complex in Honolulu, but he also has 4 acres of fish-filled pools in Hawaii, carefully guarded by 14 watch dogs. These pools contain not only tropical fishes but many of the

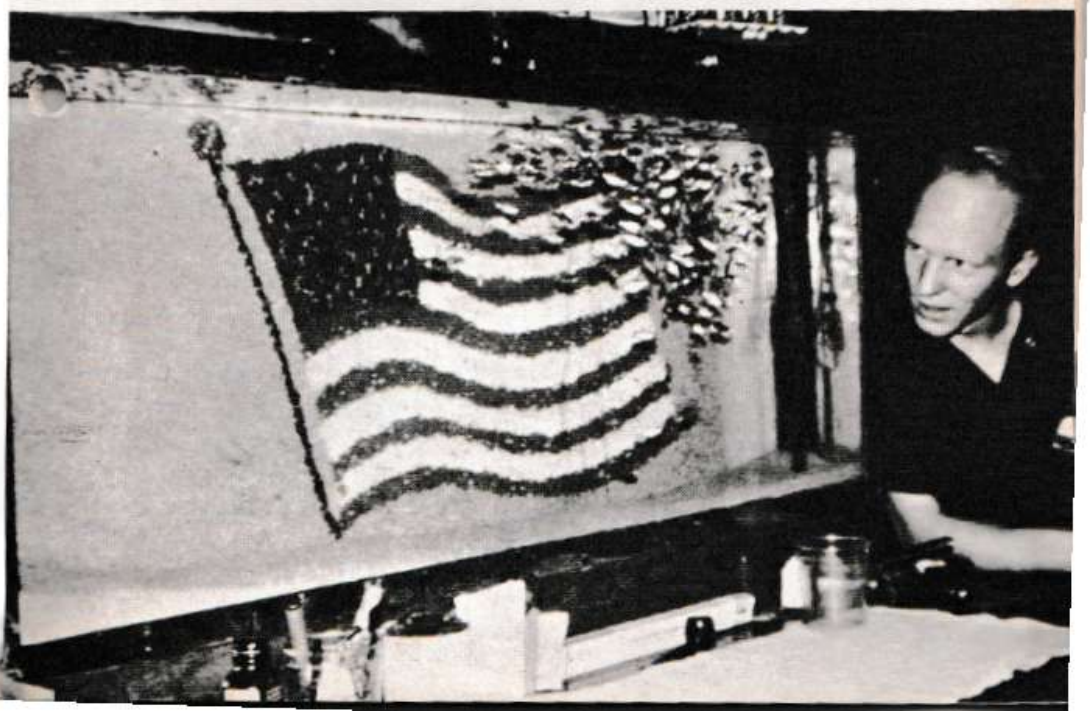


Photo: Reed Forward and his "Fourth of July" tank.

fancy varieties of goldfish and carp as well, such as the oranda, lionhead, pearl-scale, bubble-eye, celestial and a fish that Mr. Matsui said is correctly called the Nishiki-Koi. Koi means carp. To call this specific variety of carp, a "Koi Carp" is being redundant, as the entire name when translated from the Japanese comes out "Multi-colored carp," thus almost inadequately describing these brilliant hued fish.

Mr. Matsui is a veteran judge of many a fish show, although judges are frequently brought in from Japan to judge many of the Hawaiian fish exhibits. He said that the Oriental breeder demands a much greater degree of perfection from his fish and hence it is a far bigger challenge to raise a good show goldfish or carp than a tropical fish. For instance, the Japanese no longer consider what we call the "veil-tail" goldfish in their shows, although I much prefer the more poetical name that the Japanese use to describe this variety, that of "Flowing Gold." The reason that a dim view is taken of this type is that it now breeds true and hence there is no challenge! On the other hand, to get a good show lionhead is difficult. Perhaps out of 1,000 lionheads, only one will make an adequate show fish.

When a Nishiki-Koi is judged, not only do the usual show standards have to be met, such as are necessary in our tropicals, i.e. condition, color, size, etc., but the markings have to be symetrical and it has to swim straight as an arrow with nary a wobble from side to side! No wonder Mr. Matsui curls his lip slightly at the mention of raising fancy guppies and says, "They've never interested me to any degree – they're too easy."

• • •

There is a "new-old" editor who hangs up his nets and siphon hose in Omaha, Nebraska. He is a walking commercial for he is not only an editor of an aquarium bulletin, but a club member of an aquarium society as well. Fred Gross of the Aquarists of Omaha speaks frankly, "I enjoy putting out the paper and receiving all the exchanges and hearing from all the nice people throughout the country. I think that anyone seriously interested in keeping fish is miss-

Photos: (Top) If you look carefully you'll see, intertwined in the rocks, a "fire eel" rarely photographed; **(Middle)** Jiro Matsui, Hawaii, this time in "islander" style at his Honolulu Aquarium and Pet Supply; **(Bottom)** Nishiki-Kois in outdoor pool.

ing a lot if he or she does not belong to a club."

Fred has spent over 10 years in the hobby and from 1961 to 1963 he was the editor of "Tank Talk," the bulletin of the Midwestern Aquarium Club of Nebraska. A brand new club was started last February, The Aquarists of Omaha. He comments (not unhappily), "since no one else knew how to type, I, of course, was elected editor of the bulletin, 'Driftwood.'"

Fred has also been responsible for bringing *Aphysomenion nigerianum* to Omaha and that species is still going strong there. This happened through his membership in AKA and the eggs came originally from Dick Haas. "Since joining the AKA I have had many kinds of killies, including the spawningest pair of blue gularis you ever saw. They produced 125 eggs every 3 days."

To supplement what he calls his "fish fund," Fred repairs tanks for other hobbyists. This is not without its problems, however, as he lamented, "I have a 40-gallon out on the driveway, and every time I fill it to test for leaks, it rains!" ◄

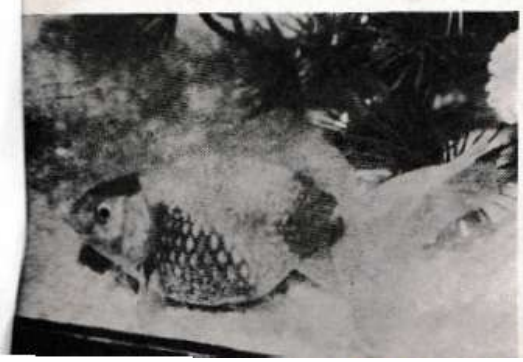
Photos: (Above) Fred Gross of The Aquarists of Omaha. Photo credit to Mr. Gross. **(Below, Left)** Pearl scale goldfish taken at J & M of the type that Mr. Matsui raises outside in his pools. This little gem costs $65. **(Below, Right)** More Nishiki-Kois in outdoor pool. These fish are always judged from looking straight down at them for correct conformation and swimming ability—never from the side view.

★ IDEAS ★
BY HOBBYISTS

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

Spawning Danios

We thought that perhaps some of your readers might like a few hints on how we have successfully spawned the species of danios. We have found that nylon net available at any department store is very useful for this purpose. Use a five-gallon tank and the net constructed in the following manner. Take 2 coat hangers and insert in neoprene tubing as was described in a previous issue of the *Aquarium Journal*. It is then bent into a U shape which can be hung at each end of the tank. The net is folded and sewn with the use of nylon knitting yarn into a shape to fit the tank you are using. This is then attached to the previously constructed forms which are then hung from the tank. Water, approximately 80° F, is then added to give a maximum depth of



away). The day she found earthworms in the refrigerator . . . However, boys (already-rational-minded boys, strong for the hobby) have ways of defending vital issues such as giving earthworms the cold they need to stay alive, specially when their female betta is getting fatter on this "best of all conditioning foods," and when the male betta on the other side of the glass partion has begun to build a nest. Our defense was as follows: "First of all, mother, the worms and their earth are in a cardboard container. Second, the reason people don't like worms is the IDEA of worms, that's all. Actually they won't hurt anybody and they don't have germs." So what else, we ATE one to prove it. I remember it was gritty, even though we had thoroughly washed it off under the kitchen faucet.

The "aquarist bible," the dark-green William T. Innes' book, had a waterproof cover, and over the years I almost feel guilty about the fact that I never read it near our tanks and therefore never got it wet, even though I could have just wiped the water off with a cloth. How well I remember the wonderful *Aquarium* magazine. It was through this magazine that we were introduced to ampullaria snails (among many other subjects) and thereby to our next crisis with mother, who this time sounded alarmingly as though she meant it when she again cried, "I'm going to throw those tanks out to Auburn Avenue!"

Ampullaria snails enjoyed a brief vogue in the early forties, mainly because for snails they could crawl amazingly fast, they breathed air from above the waterline through a retractable tube, they were supposed not to eat plants and because they laid their eggs out of water. For us, the latter trait is what did it, though. After laying a few batches on the inside of the aquarium, which had no cover, our snails took to crawling

out of the aquarium completely, down the outside and up the wallpaper to lay egg masses there! I've never since heard of similar behavior on the part of ampullarias, but needless to say it was futile to plead the singularity of it all to mother. The snails were repeating, and already there were eight or nine masses – and trail stains – on the wall.

We had to lay the Monopoly set board over the top of the tank. This too, of course, soon became covered with eggs, and we never played Monopoly again.

Each batch of eggs, however, contained many baby snails, and soon a 15-gallon tank was filled with an "uncountable" number of ampullarias, all crawling over each other in different directions at top speed. The inevitable had to happen. We did not know it at the time but this snail cannot stand foul water. In their tank were old lettuce leaves, cloudy infusoria, and probably some dead ampullarias after a while. Soon the remainder died and within a very short time the gravel was black, the water was black, and I think the air in our room must have been a sort of cloudy black too. The smell, in any case, suggested to everyone, but to mother first, that their propulsion to Auburn Avenue was at hand.

We took the survivors, a dozen or so to the nearest body of water, which was a ten-minute walk beyond the end of Auburn Avenue to the right along Macmillan Street. There was a goldfish pond, a part of the "nonfactory look" a landscape architect had tried to give to the Gruen Watch Company.

But it was worth it. I remember few thrills to compare with what we felt months later, when we sneaked again onto the Gruen grounds and hopefully tried to see down through the green

(Continued on Page 507)

Be sure there's ample sunlight for these unusual "snow blossoms"

Water Snowflake

Charles O. Masters
Walbonding, Ohio

IF WATER SNOWFLAKE plants growing in an aquarium do not receive enough direct sunlight, they refuse to send up the tiny blossoms from which they obtain their most beautiful name. Instead they continue to grow much like miniature water lilies soon filling the surface of the water with heart-shaped leaves. Other, more beneficial plants can suffer much because of the peculiarities of this plant so it must therefore be selected and propagated with extreme care.

The habits of the water snowflake are sometimes considered as being intermediate between those of the true water lily, *Nymphaea*, which is rooted in the mud and the floaters which have roots hanging freely in the water. According to some botanists it belongs to the gentian family, Gentianaceae, which is a large one made up mostly of terrestrial plants but the genus *Nymphoides* to which the snowflake belongs, is strictly aquatic. Some botanists classify them as the buckbean family, Menyanthaceae, with two genera, *Menyanthes* (Buck or Bog Bean) and *Nymphoides* (the Floating Hearts.) Others consider the Menyanthaceae as a subfamily of the Gentianaceae and then the proper subfamily name would be Menyanthoideae. Regardless, the genus includes some very pretty little aquatics with floating leaves and a lot of small, snowflake-like, flowers. Other common names besides the water snowflake and floating heart are swampflower and the sea canna.

Although there are quite a few species of these plants scattered throughout the world in both tropical and temperate regions, the ones most commonly used by aquarists are as follows: (1) *Nymphoides indica* from India and other tropical parts of the Orient as well as from the rain-forest swamps of Australia, (2) *N. humboldtiana* from the tropics of South America, and (3) *N. peltata* which has now been introduced from parts of temperate Europe and Asia and naturalized in widely scattered places in the United States.

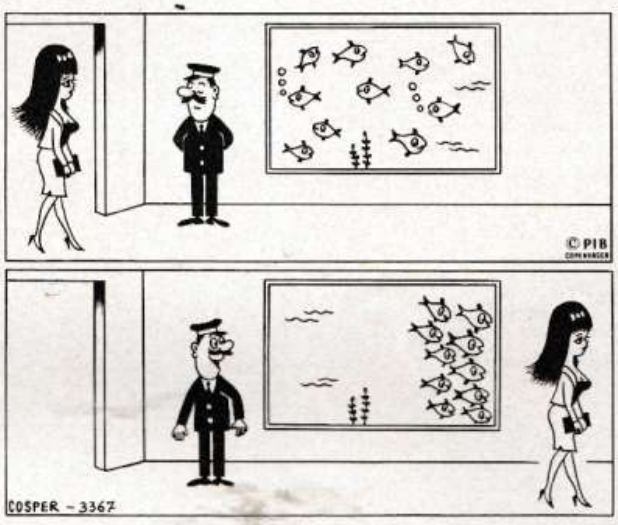
Sometimes a few others which are American natives make themselves quite

at home in aquaria and are to be recommended. These include *Nymphoides cordata* from the eastern and southern states and *N. aquatica*, a true southerner which is now found in New Jersey, Delaware, and even Iowa.

Many other very desirable species are found in the ponds and sluggish streams of tropical Africa, Asia, South America, and Polynesia, and new ones keep showing up from time to time (*L. kirkii*, from S. Rhodesia in 1952, and *N. flaccida*, from Colombia in 1952) so that it is possibly here that new "miniature lilies" may some day appear.

The three to four inch leaves of all species are quite small and closely resemble those of water lilies although on a much smaller scale. Blooms which appear at the base of the leaves are held a few inches over the water and are usually white in color. Those of the species *peltata* are yellow. All are about one inch in diameter and quite star-like in structure. Although the blossoms last only a day, there are so many coming all the time they can be appreciated all season long. Direct sunlight is required, however, for the continued production of blossoms.

Small heart-shaped leaves float on the surface of the water and their number is in direct proportion to the richness of the soil. The species *peltata* was so named because the numerous leaves resemble so closely the shape of shields (peltate=shield), but the resemblance to a heart is more generally accepted. Growth is extremely fast where conditions are best so some attempt should be made to control the plant in aquaria or outdoor pools. The author remembers how difficult it was to kill mosquito larvae by the aerial spraying of DDT solution on water covered with *Nymphoides*. In 1925, research work on the Volga River demonstrated that the growth of petioles in deep water is extraordinary rapid. In fact, they will sometimes grow more than three feet in two days or, at times, an inch per hour.



Because of this amazing potential for growth, it is best that the proportion of rich soil to coarse sand for the substratum be kept at a very minimum. In fact, perhaps the use of coarse sand with-

out any plant nutrients in the soil should be recommended. In Java lakes, poor in soluble plant nutrients, high iron content, and with a striking deficiency of potassium, calcium, and phosphorus, the plant grows well. Conversely, the use of a rich loam will produce heavy leaf growths and then it is only necessary to furnish a wide surface area of water so they can spread rapidly. Any piling-up of leaves will cause the death of those underneath with a polluting of the water.

Reproduction is by means of runners at the water's surface or bottom and the production of seeds in pods. Leaves break off and float away, re-establishing themselves as new plants in shallow water. The parent plant should be rooted in soil with the crown of the root 6 to 18 inches below the surface. Mature leaves, if cut off and placed flat on wet soil, will form roots in a short time but it is necessary that the entire leaf be pressed flat on the sand's surface. New plants are thereby easily obtained.

Temperatures of seventy to eighty-six degrees are best for *N. indica* and *N. humboldtiana* but *N. peltata* will thrive in the colder tanks and pools where it "dies down" to "hibernate" during the winter season.

In waters of greater than fifteen degrees hardness, growth of both leaves and blossoms is reduced considerably so that it is suspected that best results can be obtained in the softer waters.

Where conditions are optimum, the growth of competing species is very easily checked by the plant itself. No other aquarium plant can easily crowd out the water snowflake, especially if all culture requirements of the species are present. *N. peltata* seems to be most successful in the average fish tank, especially if adequate light is furnished but the tropical species are quite in demand at all times. ◄

Bear

(Continued from Page 503)

water for signs of that characteristic fast crawl on the bottom of the pond. We suddenly realized instead that right under us a tiny wormlike tube was sticking up out of the water drinking in fresh air. From this one we went on to discover approximately all the original number. I don't know why but we were on the verge of being misty-eyed; we felt that the ampullarias had done something almost heroic.

I remember too, from those days, the shock and disappointment of finding out that some of the people commercially involved with tropical fishes were ignorant, that they said pH and other water factors were a lot of bunk, and that some writers were just trying to make a little money and that they didn't know anything about fishes at all. One very large breeder I finally met pronounced cichlids as "chicklids," and he fed his fishes oatmeal, not something special, much less alive. [*Editor's note: The British pronounce it in a fashion close to kick'lids and is our pronunciation of it as* sick'*lids so much better?*]

But fish-keeping and fish-raising were good for us. It gave us adolescents another dimension to life. After the softball games in the street, there were always the tanks to come home to and occupy our interest. The tanks where the latest breeding was taking place or where a recently purchased fish was surviving, or not surviving. It was a good thing for two teenagers. ◄

PRODUCT NEWS

Rila Marine Aquarium Kit

A marine aquarium can be set up and maintained easily and economically with Rila's Salt Water Aquarium Kit. Complete kit contains (10

gallon size) 3 bags Rila Marine Mix. Hydrometer-Thermometer combination, Salt Water pH Test Kit, Formula 'T,' Liqui-Glass, Revita-Sol, and a 3-page Instruction Booklet. Can be used for setting up larger aquariums – simply add extra bags of marine mix as needed. Packaged in an attractive, easy-to-display carton . . . makes an ideal gift item. For additional information write: Rila Products, Box 114, Teaneck, New Jersey 07666.

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Gro-Wel Spawning Grass

The Gro-Wel Division of Aquariums Incorporated, 87 Route 17, Maywood, New Jersey is proud to announce that at the American Pet Products Manufacturers Association Trade Show held in New York City on July 9th, 1964, their Gro-Wel Spawning Grass display Box was awarded a Certificate of Honorable Mention in the category of 'point-of-sale' display box.

This beautiful display box will certainly aid in the sale of a product which has won universal acceptance in the aquarium industry.

Gro-Wel spawning grass, an entirely synthetic product, made with special plastic fibres and *stainless steel* wire, is an ideal aid for breeding tropical fish of all kinds. This product has been used for egglayers and adhesive egglayers as well as for livebearers. ◄

New Aquarium Shop Opens In East Bay — San Leandro

"San Leandro Tropicals" is the name of the attractive new aquarium store now open for business in the East Bay, according to Gregory Gillespie, owner and well-known hobbyist in the Bay Area.

"San Leandro Tropicals offers everything for the aquarist, including the finest quality and selection of fish – in sparkling clean tanks. Also the hobbyist will find a varied selection of fishfoods, remedies and equipment," Gillespie said.

CLUB NEWS

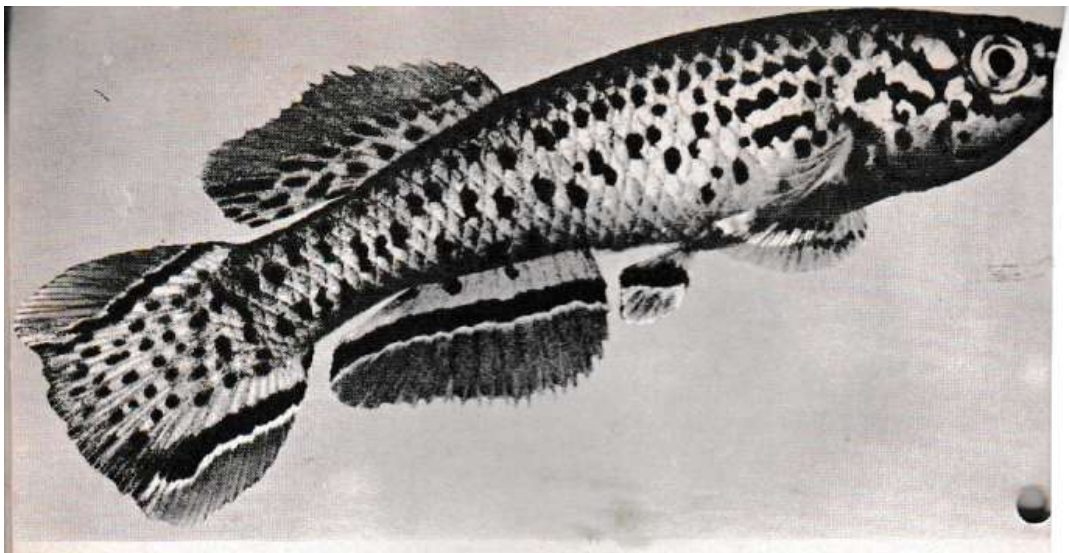
Greater Cincinnati Aquarium Society

The Annual Guppy Show and Aquarium Beautiful Display of the G.C.A.S. will be held Sun. Oct. 18, 1964 at the Xavier University Armory on the university campus at Dana Ave. & Victory Parkway, according to Mrs. Art Hopkins, publicity chairman. For further information, write Art Hopkins, show chairman, 5705 Adelphi Ave., Cincinnati 27, Ohio.

• • •

Blackhawk Aquarium Society
(Moline, Ill.)

The B.A.S. will hold its Fifth Annual Tropical Fish Show Sept. 12, 13 and 14, 1964 in the Rumpus Room at Blackhawk State Park, Rock Island, Ill., according to Karen S. Bream, chairman. For more information about the show, contact Miss Bream at 744 24th St., Rock Island, Ill.



Discovered in 1955 in Western Nigeria
and first brought to Denmark in 1957

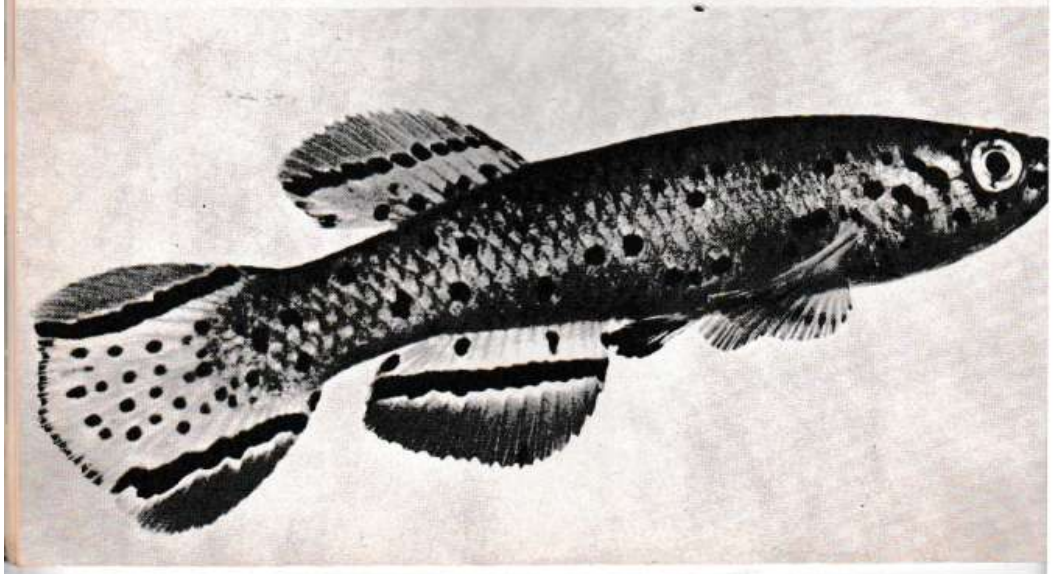
Aphyosemion Nigerianum

PART I

IN 1955, a population of an unidentified *Aphyosemion* was discovered by H. S. Clausen at Akure in Western Nigeria. Specimens from this area were brought alive to Denmark in 1957 by the zoologist, J. Birket-Smith, from whom I obtained the fishes. During 1958-60, eggs from this species were distributed by airmail to many aquarists abroad and several aquarium stocks were established, even as far away as

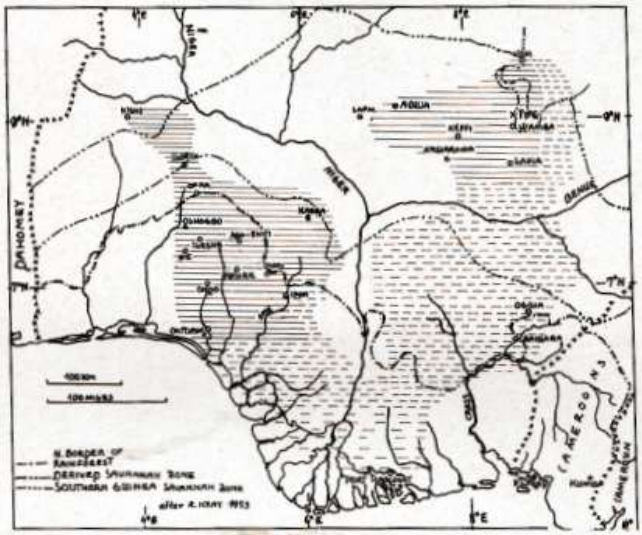
Joergen Scheel
Copenhagen, Denmark

Photos: (Fig. 1. Top) Adult male **Aphyosemion nigerianum.** Port Harcourt strain. **(Fig. 2. Below)** Adult male **A. nigerianum.** Owo strain. Photos in article by the author.



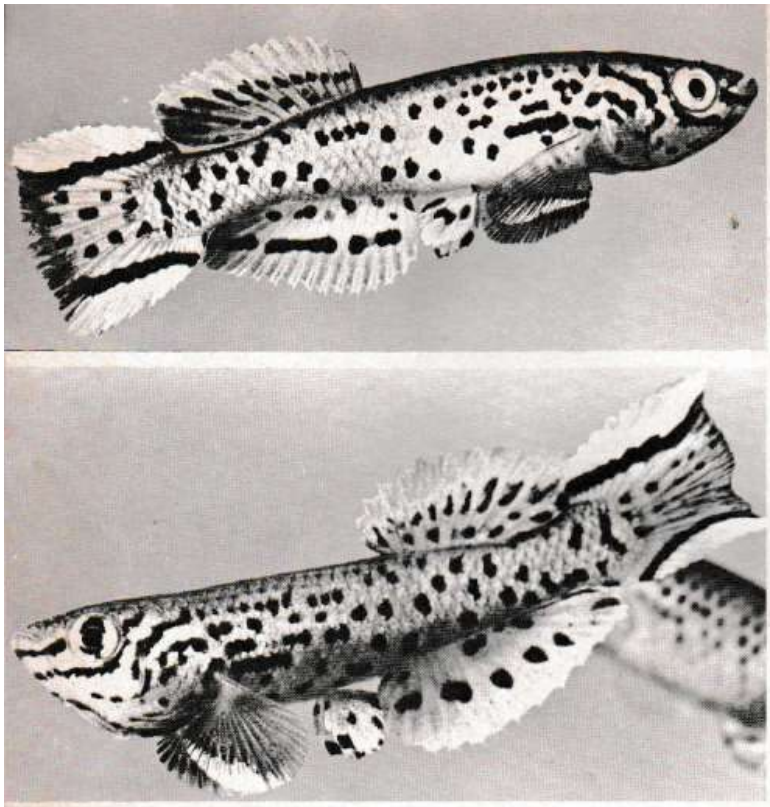
New Zealand and Uruguay. I used the name "*Aphyosemion calliurum*" for this species at that time. As far as I know, all aquarium stock at present originated in my tanks and belongs to this Akure population. Young Ulf Hannerz of Sweden caught two small males in 1961, apparently belonging to the same species, at Wokocha River near Port Harcourt in the eastern Niger Delta area. In 1962, Clausen caught live specimens of a third population at Owo, some miles east of Akure. These fishes also found their way to my tanks.

Soon after the importation of 1957, Clausen and I were aware that the fish from Akure could not be the same as Boulenger's "*Haplochilus calliurus*," said to originate from Liberia. There is a discrepancy when one compares the written descriptions of Boulenger and J. P. Arnold (who delivered the preserved material on which Boulenger based his description of *calliurus*). According to Arnold, the fish came from freshwater pools in Sierra Leone whereas the Liberian material originated from Monrovia (Liberia) and contained only *Epiplatys dageti* (called "*chaperi*" by aquarists) and *Aphyosemion liberiense*. Clausen has inspected the type specimens at the British Museum and he is quite sure that this material belongs to the aphyosemions found east of the Dahomey. Also, Arnold expressed doubt that the locality given him by the sailor who brought the fishes to him, was the true one. Shortly after the first importation of "*H. calliurus*," new importations of this fish came in from the Niger Delta area. The only difference which Arnold found between these two stocks was that the second importation did not feature males with very long fin rays. Descriptions of the live fish, drawings, photos, etc., in the German aquarium magazines of that time clearly indicate that "*H. calliurus*" and in particular, the second importation, is extremely close to an *Aphyosemion* which Clausen brought home in 1962 from southwest Nigeria.



Sketch: Map showing areas where fish were collected.

The following account is by H. S. Clausen:



Photos: (Fig. 3. Top) Young male, Port Harcourt/Akure cross. The "blue" pattern of the anal fin is not normal **(Fig. 4. Below)** Young male, Port Harcourt/Akure cross, with normal anal fin pattern.

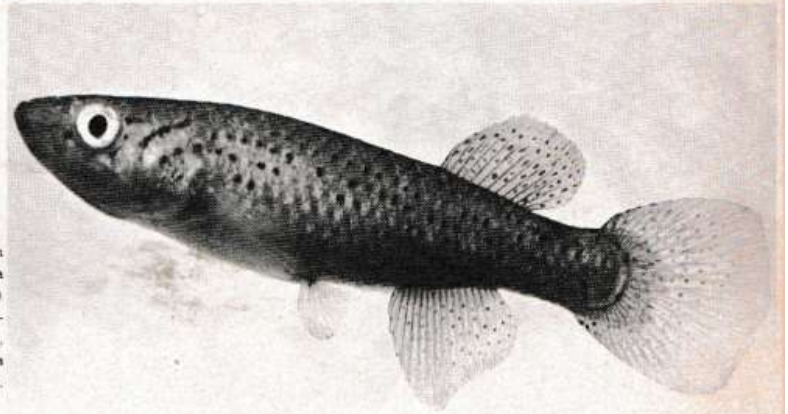
"*Aphyosemion nigerianum* is found all over southern Nigeria except in the western-most parts of the western region. Unlike most other aphyosemions, this species is not confined to the rainforest and derived savanna, but occurs also in the Guinea savannas, and extends over a large part of northern Nigeria. Here, as well as in western Nigeria, it is especially common in streams on old rock of the types grouped by geologists under the heading, "basement complex"; however, although it is often replaced by *A. bivittatum* in the sedimentary areas (both in the savanna and in the rainforest), it may be caught in any geological zone. It is particularly abundant in western Nigeria within the quadrangle Awtun, Ife, Ondo and Akure, and in northern Nigeria on the highest parts of the Jos plateau (Vom and its neighborhood). The type locality is a swamp at Arum, north of Wamba, on the southern foothills of the Jos plateau. Although *A. nigerianum* is widespread both in the southern and northern Guinea savanna, it has never been found in the still more arid Sudan savanna belt. The eastern limit of its distribution is not known with certainty and it is not unlikely to exist farther east than indicated on the map. The typical forms of *A. nigerianum* have not been found outside Nigeria, but closely related forms, which may possibly be races of the same species, were collected from several places in Cameroun. Unfortunately, no live specimens of these survived the rigors of transportation. In the Oban hills and adjoining districts in the Nigeria/Cameroun borderlands east of Lower Cross River, *A. nigerianum* seems at least partially replaced by a related but different species (still undescribed), referred to later in this article as "*Aphyosemion*

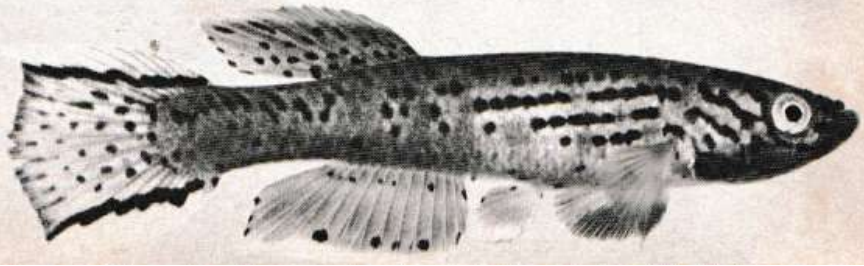
from the Ndian River." *A. nigerianum* inhabits natural waters of widely different ionic concentrations, with conductivities from below 20 to over 200 mhos (reciprocal megohms). This perhaps explains why it has proved to be a much more robust aquarium fish than any other *Aphyosemion* imported."

Within the Akure population, two male varieties occur. According to aquarium tradition, the terms "yellow variety" and "blue variety" will be used for reference. From the Owo and Port Harcourt populations, we have obtained only yellow varieties, and it is likely that the blue variety does not exist there at all. The varieties which resulted from the crossing of the Port Harcourt and Akure populations will be mentioned later on. When dealing with such highly complicated problems as the colors and patterns of aphyosemions, I think that one should not use orthodox descriptions as one, for example, will find in popular aquarium reference books. In this article, I shall try to be much more specific.

The colors and patterns of the mature aphyosemion male probably reflects a complicated system of signals vis a vis its surroundings. The brilliance and contrasting color pattern of the adult male makes it easier for the female to find it when they are ready to spawn. In addition, they signal to other fishes the sex and species of the fish in question. These colors and patterns might be divided into 3 or 4 groups: the black, red and yellow pigmentations, and the bluish brilliance.

The brilliance of the male mostly comes from guanine crystals distributed over the body and sometimes even the fins. Unlike the more constant colors of pigmentation, this brilliance varies much depending upon the composition and angle of the light in which the fish is seen. Normally, *A. nigerianum* is considered as being bluish-green. This is the color in incident light coming from





Photos: (Fig. 5, Top) An old female hybrid from **a gulare/nigerianum** (Akure) cross. **(Fig. 6, Bottom)** Hybrid male, 3 months old, from **australe x nigerianum** (Port Harcourt/Akure) cross.

above. If one directs the light on the fish horizontally, the fish looks much more blue. If the light comes from below, the fish may look violet-blue. As Walter Foersch first pointed out for some South American killies, the brilliance of rivulin males also depends upon the light conditions in the tank where the fish was raised. Males from light tanks become much more brilliant than males from dark tanks. This is probably caused by an increased development of dark pigments in the latter.

Black pigments, so important when studying *Epiplatys*, play a minor role in aphyosemions. Black pigment cells do not form conspicuous patterns but are rather evenly distributed on the sides. The red dots on the sides may show blackish edges or even an even blackish-red color which makes these spots more conspicuous. A few aphyosemions, however, have important black pigments.

Red pigments seem to be the most important pattern-forming element. These pigments form the conspicuous red spots on the sides. There are about three times as many red dots on the sides of males from the Port Harcourt population than on males from Akure. The Owo males are just like the latter.

The intergrades (i.e., "crosses") produced by mating a Port Harcourt male to an Akure female has about twice as many red dots as had Akure males.

Just behind the gillcovers there is a concentration of red dots which are dark-edged or even blackish-red. Such "wounds" or false "eyes" are present also on males of other *Aphyosemion* species and may be rather conspicuous on *Aphyosemion petersi*. An alike pattern exists on males of *Pterolebias longipinnis*. A somewhat different, perhaps more ancient pattern, is formed in fighting or breeding males of *A. bivittatum* by a strong reduction of the upper black longitudinal band. I use the term "false eye" because it may be that these black-

(Continued on Page 519)

PROGRAMS

Readers and societies are invited to submit ideas to The Journal *for Aquarium Society meeting programs, including lectures, slides, films, demonstrations, etc. There is no charge for these listings.*

"Saltwater Aquarium in the Home," a new 16mm film in color. Running time, 25 min. Rental: $15. For information: Coral Reef Exhibits, P.O. Box 59-2214 Miami 59, Florida.

"Story of the Brine Shrimp," a 30-min. color and sound 16 mm film that also covers the tropical fish hobby. Rental: $10. For information: San Francisco Aquarium Society, California Academy of Sciences, San Francisco 18, Calif.

"Fascinating Marinelife of the Pacific Northwest," a visit to the Seattle Marine Aquarium. 30 color slides 35 mm. Rental: $5.00 plus postage. For information: Eric Friese, 105 NW 49th Street, Seattle, Washington 98107.

"Diane Schofield's Color Slides," a selection of different programs of color slides complete with commentary by Miss Schofield. Each program rents for $5.00. Sample programs: "Familiar and Strange Fishy Little Faces," "Fish of India," "Fish of Hawaii," "Marineland of the Pacific," "Seeing the Seaquarium," etc. For more titles and information, write Diane Schofield, 739 E. Valencia St., Burbank, Calif.

"Killifishes," a slide-tape program created by Al Klee, Franz Werner, Richard Blanc and George Maier. The program is available for aquarium societies on the West Coast by contacting Alan Markis, 2607 Bryant St., Palo Alto, Calif. Midwestern and East Coast societies may obtain it from George Maier, 802 Belmont Ave., Chicago, Ill.

"Aquarist Adventures in Southern California," an educational tour of aquatic topics. Local fishes, field trips, fish shows, shops, hatcheries and Marineland with society programming in mind. 50 color slides 35mm. incl. 50 narrative "read cards." Directions. Rental: $15.00 ppd. one way. For information: Gene Wolfsheimer, 4549 Tobias Ave., Sherman Oaks, Calif.

Neglected barbs simply because they grow larger than most tropicals —

The Clown Barb

Jack Hems
London, England

PART I

THERE ARE several outstanding handsome and inoffensive barbs which grow to an appreciable size and, because of that failing (in the eyes of not a few aquarists), are all too infrequently seen in the tanks of dealers.

Among the choicest of these neglected species is *Barbus everetti*, popularly referred to as the clown barb. This fish reaches a length of a little over five inches, is native to the Malay Peninsula, Singapore and Borneo and, according to reliable German authorities, was first introduced to hobbyists as long ago as 1913.

In general appearance the clown barb is greenish olive to greenish gold melting imperceptibly to silvery white on the lower parts and belly. Two or three lavender-blue to blue-black wedge-shaped markings, originating on the back, and pointing downwards, and a few similar-colored blotchy spots and a broken horizontal line, extending from about the middle of the body to the root of the tail, adorn the sides.

Here and there, especially when the fish moves under or before a good natural or artificial light, the largish scales shine with a mirror-like brightness. A pink to wine-red tint suffuses the fins, except the pectorals, which are clear. There are two pairs of well-developed barbels on the mouth. Sexing is comparatively easy when the fish are mature; for then the female's body is heavier- and more rotund-looking than the male's, and her colors are more subdued.

At most times the clown barb frequents the middle to bottom layers of the water, but now and then it will swim excitedly at or near the surface in search of food. Like must cyprinids, it will eat almost anything, but grows fastest, stays healthiest, and lives longest (interested aquarists may care to know that the species has a life-expectancy of about seven or more years) on a diet consisting in the main of regular live and fresh foods supplemented with such greens as bruised or partially cooked lettuce, cooked spinach, duckweed and the like. Perhaps it is superfluous to say that it is passionately fond of pasturing on mossy algae.

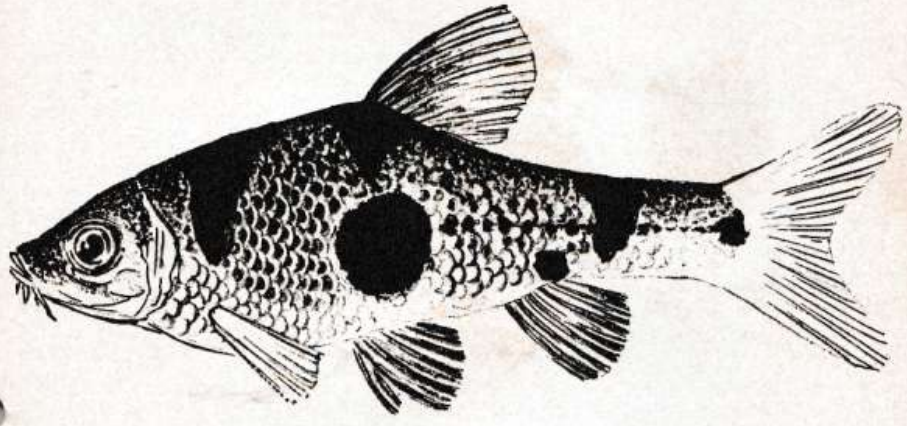
Apart from an aquarium large enough to give it ample swimming space (a tank measuring 24x12x12 inches can be considered the minimum for a full-grown pair), the clown barb flourishes best in clear (that is sediment-free), neutral (or inclining to acid) water maintained at a temperature range of 75 to 80 degrees F.

The clown barb is not a ready breeder, but separation of the sexes for a month or so, combined with a generous diet richer than usual in nourishing live food (chopped earthworms come first to mind) will sometimes bring a couple into ripe spawning condition.

The essential requirements for spawning are a scrupulously clean, well-lighted aquarium at least thirty inches long,

recently matured or oldish water about nine or ten inches deep and, to cradle the sticky eggs, masses of fine-foliaged plant life (or teased-out nylon mops) weighted to the grit-covered bottom.

A couple in spawning condition display enhanced colors, an increased liveliness of manner and, besides and beyond all this, the female's sides show a distinct bulge. If the fish are transferred to the prepared aquarium late at night, and the temperature of the water is gradually raised a degree or two above normal, then the chances are that mating will take place before the next twenty-four hours are out.



Sketch by the author.

The preliminaries to mating are typical of the barbs. There is, to begin with, some inquisitive nosing about among the plants, or substitute spawning medium. Furthermore, the male keeps fussing around the female until, overcome by his persistent attentions, she dashes away. Thereafter, a series of chases takes place during which several hundreds of eggs are scattered as the female is pursued, or brought to a temporary halt, in the spawning medium.

Spawning may continue, on and off, for an hour or more, after which the spent fish (though never too spent to make a meal from the eggs) must be removed to another tank.

At a temperature of 80 to 82 degrees F, the eggs hatch within two days, but the quite large fry – as barb fry go – do not attempt to swim about until they have absorbed the contents of the small yolk-sac. This takes another two days or so, and until then they hang tail-downwards from the plants and the sides of the aquarium. Some may even be seen hanging at the surface of the water. Yet once the yolk-sac is gone they strike out in all directions, and develop an insatiable appetite for food.

Infusoria and thick green water ("free-swimming" algae) are recommended for the first few days of their active lives, after which such things as Grindal worms, brine shrimps, or screened daphnia in ever-increasing quantities are called for.

If suitably-sized small live foods are in short supply, and a dust-fine dried food (which the fry will readily accept, anyway, but not grow so fast on) is used as a substitute, it is as well to

gallon size) 3 bags Rila Marine Mix. Hydrometer-Thermometer combination, Salt Water pH Test Kit, Formula 'T,' Liqui-Glass, Revita-Sol, and a 3-page Instruction Booklet. Can be used for setting up larger aquariums – simply add extra bags of marine mix as needed. Packaged in an attractive, easy-to-display carton . . . makes an ideal gift item. For additional information write: Rila Products, Box 114, Teaneck, New Jersey 07666.

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Gro-Wel Spawning Grass

The Gro-Wel Division of Aquariums Incorporated, 87 Route 17, Maywood, New Jersey is proud to announce that at the American Pet Products Manufacturers Association Trade Show held in New York City on July 9th, 1964, their Gro-Wel Spawning Grass display Box was awarded a Certificate of Honorable Mention in the category of 'point-of-sale' display box.

This beautiful display box will certainly aid in the sale of a product which has won universal acceptance in the aquarium industry.

Gro-Wel spawning grass, an entirely synthetic product, made with special plastic fibres and *stainless steel* wire, is an ideal aid for breeding tropical fish of all kinds. This product has been used for egglayers and adhesive egglayers as well as for livebearers. ◄

New Aquarium Shop Opens In East Bay — San Leandro

"San Leandro Tropicals" is the name of the attractive new aquarium store now open for business in the East Bay, according to Gregory Gillespie, owner and well-known hobbyist in the Bay Area.

"San Leandro Tropicals offers everything for the aquarist, including the finest quality and selection of fish – in sparkling clean tanks. Also the hobbyist will find a varied selection of fishfoods, remedies and equipment," Gillespie said.

CLUB NEWS

Greater Cincinnati Aquarium Society

The Annual Guppy Show and Aquarium Beautiful Display of the G.C.A.S. will be held Sun. Oct. 18, 1964 at the Xavier University Armory on the university campus at Dana Ave. & Victory Parkway, according to Mrs. Art Hopkins, publicity chairman. For further information, write Art Hopkins, show chairman, 5705 Adelphi Ave., Cincinnati 27, Ohio.

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Blackhawk Aquarium Society
(Moline, Ill.)

The B.A.S. will hold its Fifth Annual Tropical Fish Show Sept. 12, 13 and 14, 1964 in the Rumpus Room at Blackhawk State Park, Rock Island, Ill., according to Karen S. Bream, chairman. For more information about the show, contact Miss Bream at 744 24th St., Rock Island, Ill.

East Bay Aquarium Society, Inc.

The E.B.A.S. will hold their 8th Annual Exotic Fish Show Nov. 14 and 15, 1964 at the Exhibition Bldg., next to the Oakland Auditorium, Oakland, Calif., according to Show Chairman George Mitchell and Co-Chairmen Dick Law and Al Seguin.

Set up date is Nov. 13 (after 6 p.m.), and take down Nov. 15 (after 8 p.m.). The Golden Gate Cat Club will also be holding their Annual Show on the premises at the same time. Registration fee is 50c per competitive entry. Minimum fee is $1. The E.B.A.S. will furnish stand, electric power, fresh tap water and air only, according to the chairmen.

Scheel

(Continued from Page 515)

ish dots imitate an eye, and thus save the real eye from some of the attacks which rival males may direct against it during fighting.

As on many other *Aphyosemion* males, the rows of red scale-dots tend to form longitudinal red lines on the anterior part of the sides, and vertical lines on the posterior part of the body. Such systems are more conspicuously developed on *Aphyosemion coeruleum*. On the head, the red pigments form lines rather than dots. On the gillcovers there are the usual "worm-like" patterns. The throat pattern of this species is rather glaring and also somewhat complicated. As usual among African rivulins, a basic pattern is visible. These patterns are generally associated with the system of sideline pores but not always. Principally, the pattern of *A. nigerianum* is that of *A. bivittatum* if we change the black pigments to red. The red line just behind the lower lip is well-developed. From below the eyes, a more or less complete curved red line runs parallel to the first red line. There is also much red pigment below the gillcovers and, here and there, on the throat.

(To Be Continued)

Letters to The Journal

From: A. R. Caspell
Fort Sheridan, Illinois

In regard to the Mitchell's article on goldfish "On Keeping Goldfish," I have a question. Can you keep loaches with goldfish? I now keep a pair of loaches with my goldfish, a pair of pink and black three inch specimens. Many thanks for any help you may offer.

REPLY: Yes, loaches can be kept with goldfish. However the "pink and black" loaches, i.e. the various species of kuhli loaches are true tropical fishes and have a higher optimum temperature than goldfishes. 74 to 75 F will be all right for both but for best health goldfish should be kept at 68 to 70 F. most of the time and the loaches at 78 to 82 F. There are other loaches, such as the weather fish that do best in cooler water and these are available occasionally, especially from dealers that import goldfish from Japan.

* * *

From: Bob Brown
Phoenix, Arizona

Although not a subscriber to your magazine, I usually seem to have several around the house. I would like to have a certain type of fish identified that appeared in your April 1964 copy of the *Aquarium Journal*. It is shown on page 195 in the lower photo in an article about catfish, the author being Braz Walker. The fish appears to be a cichlid and one that I have kept before but had never had a proper identification. I would like the common name as well as the Latin term for this fish and also, if possible, where I could purchase several specimens. For a period of four years, I have raised a number of the less common type of cichlids and this species would make a fine addition to my large tank.

REPLY: The cichlid appears to be Geophagus jurupari, *a fish of wide distribution in South America. The specimen in the photo looks a little deep-bodied for this species but the fish is slightly turned and therefore the body foreshortened, causing it to look deeper than it really is. I have heard a variety of common names for this fish, some of them unprintable, one author sums these up by calling it the devil fish. This is primarily because of its digging habits. The fish is handsome, in a way, and it has interesting breeding habits. It is a mouthbreeder, caring for the young, but apparently not the eggs, orally. Unfortunately I cannot tell you where to get any currently. The best one can do in obtaining a fish that is only moderately common is to watch local tropical fish stores, or if desperate, advertise for them. Also write to larger well known tropical fish establishments that sell and ship fishes in individual containers. Some of these may have what you want.*

* * *

From: Mrs. George C. Bach
Palos Verdes, California

We are in planning stage for a marine aquarium of 50-60 gals. We have read everything available in our library – much of it very dated – and have talked to everyone we can find who knows anything on the subject. The more we read and the more we talk the more confused we get. Our trusted dealer for freshwater fish considers the idea foolhardy. The nearest dealer in marine aquarium and salt water fishes is Dr. Adams in Long Beach. His ideas contradict much of what we have read, yet he has success himself and successful customers. In desperation for some guide out of the muddle we turn to you. From

my reading and reference in numerous books it is apparent that your society is held in high regard throughout the world. We would greatly appreciate your professional opinion of two basic points. First, plastic versus metal framed glass tanks. My reading has led us to believe that plastic was the best possible, yet Adams uses, apparently with success, metal frame tanks. They recommend aging the tanks for 2 weeks. If plastic is definitely more desirable we are willing to pay the extra cost, but don't know where to find them. Can you help us here? Our second basic problem is the filter system. All I read is against a biological undergravel filter for marine aquariums. My freshwater dealer does not like them ever for freshwater systems, and our five tanks are currently equipped with outside filters. Yet, Adams who will be our dealer and advisor for the marine aquarium, believes that the biological filter is best. If you do not prefer the undergravel filter, would you tell us your preference? We shall be extremely grateful to you for any help you can give us.

REPLY: First I would like to say, postpone the 50-60 gallon tank for a few months until you have had experience with a 15-20 gallon marine tank. It is true that it is easier in certain ways to maintain the larger tank; however, if you have a loss due to inexperience, the loss with a small tank will not be as great. When you have success with the smaller tank, then proceed with confidence. Good *quality stainless steel framed tanks are excellent, especially if the inside is "beaded" and the metal covered by a product such as "Silastic." Sometimes, however, really excellent quality stainless steel framed aquaria are hard to find and recognize from the inferior product until later when rust develops. I have kept marine fishes even in old wrought iron aquaria but do not recommend it. Plastic of course eliminates the metal contamination problems but it tends to scratch easily, especially from sand; the plastic must be cleaned with material that does not scratch. I prefer a metal framed aquarium but would not want to say it was the best. I also prefer to do my filtering outside of the aquarium and be able to remove completely from the aquarium environment the filtered material. On the other hand, many people have had success with undergravel filters in marine aquaria and I am in no position to condemn their use. I suggest that you try Dr. Adam's method on a small scale; see how it works for you.*

• • •

From: Robert G. Sims
Sacramento, California

I have some questions, 1) Do you have any information on breeding the "Plecostomus" catfish? 2) Do you have any information on the "Shadow Fin Shark"?

REPLY: 1) I know of no certain records of breeding plecostomus or its several close relatives in aquaria. Few people try. There are records for at least some of the many species of Loricaria, *a related fish. In the spawning, the pair laid eggs on a rock and the male cared for them. Many species of "Pecostomus" and relatives live in holes or mud banks. What significance this may have in breeding is unknown to me but it may indicate that we cannot provide the proper habitat for them in our tanks. One species at least, has escaped and is breeding in Florida waters; (2 I cannot connect this common name with any aquarium fish known to me. Perhaps a reader is familiar with this name and can help.*

• • •

From: Bruce Lingley
Somerset, Mass.

Re: Algae Eater by Hazel Hall, in the August 1964 issue. Enjoyed very much the article mentioned above, and also the article on plants by Wm. Dewhurst. I am interested in finding out more




SCENES AT THE W.W.P.S.A. TRADE SHOW

Top Row: Gro-Wel (Aquariums, Inc.); Framar Mfg. Co. (Clyde and Mrs. Hutchinson); Brine Shrimp Sales Co. (Maurice Rakowicz with visitor Gene Wolfsheimer).

2nd Row: Eastland Tropical Fish Hatchery (John Kopec); Miracle Filter Co. (Norman Hovlid); Santa Anita Tropical Fish Hatchery (Mr. and Mrs. Bert Holstein (left) are shown congratulating winners of their merchandise prize.)

about the bloating disease in the Chinese algae eater. I have just lost an algae eater, and I have another one which seems to be swelling the same way the other one did before it died. I wonder if you can tell me more about this bloating disease, and also if there is any sort of cure for it or not.

REPLY: I wish we had some solid advice to give. What causes the "disease" is unknown to us. I have had two specimens for over a year with no evidence of the disease. A friend bought two from the same dealer's tank and lost his to this within two months. He feeds his fish more heavily than I but I have no idea if this makes any difference. Since Gyrinocheilus *is such an excellent algae eater, even disposing of blue green algae, we would like to see this problem licked. Has any reader had experience with this disease that would help?* ◄

Join the S.F.A.S.