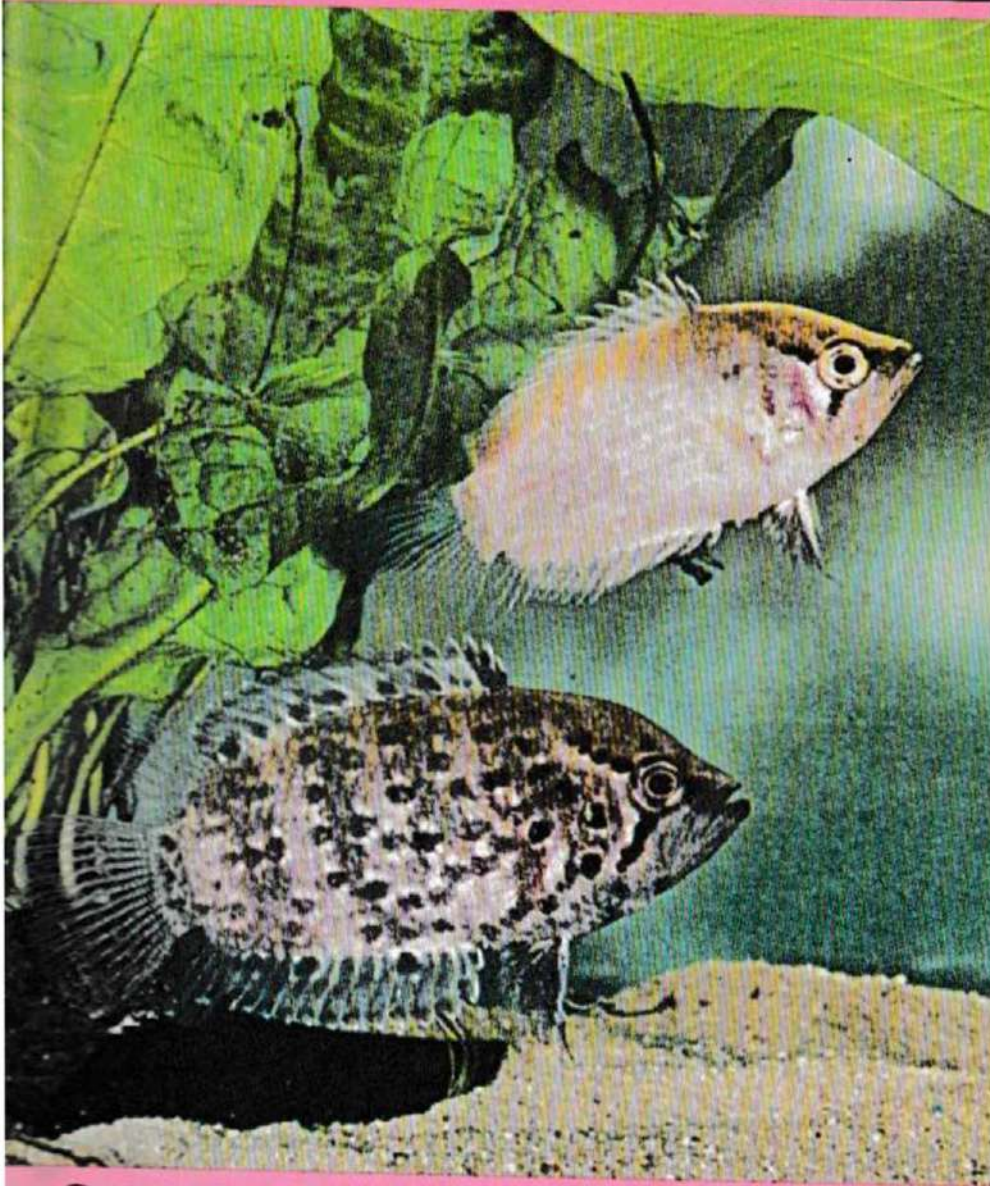


April, 1969

# tropical fish hobbyist

DOMESTIC 40c / British Isles 3/-



Spawning \_\_\_\_\_

*Polycentrus schomburgki*

# tropical fish hobbyist

Vol. XVII, April, 1969 (#158, No. 8)

## contents

Spawning <i>Polycentrus schomburgki</i>	4
Bettaphile	10
The Golden Ram	14
Those Satisfying Swordplants	26
Your Fishes' Health	29
<i>Pygocentrus nattereri</i>	33
Guppy Corner	62
<i>Aphyocharax dentatus</i>	67
Mail Call	69
Salts From The Seven Seas	85
My Bulging Bagrid	90
Photo Contest	98

### cover

All of the aquarium leaf fishes (that is, *Polycentrus schomburgki* and *Monoctenopus polyacanthus*, the South American species, and *Polycentrus abbreviatus*, the African species) offer very little in the way of color and movement. Why, then, do they continue to remain on the aquarium market? Why haven't they, along with other fishes that have lacked esthetic appeal while presenting very definite problems of aquarium management, been consigned to the aquatic junkpile? Perhaps the answer lies, as author/photographer Rudolph Zukal believes, in their interesting behavior and frequent changes of color. And maybe that they are comparatively easy to spawn and raise the fact having to do with it, too. Mr. Zukal took the cover photograph of the about-to-spawn pair of *Polycentrus schomburgki* and tells about his experiences with this fish in the article beginning on page 4.

### exotic tropical fishes supplements

Pages 33 and 34, 67 and 68. These pages are perforated for easy removal and punched to fit into the Looseleaf Edition of EXOTIC TROPICAL FISHES.

rates 40¢ per copy in the U. S. 60¢ per copy in Canada or foreign. \$4.00 for 12 issue subscription in U.S. Add 60¢ per year for foreign subscriptions. Index available in every 12th issue.

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 13 Mulvey Lane, Reigate, Surrey, England. All subscriptions and inquiries should be sent directly to them.  
©1969 T.F.H. Publications, Inc.  
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc., at 245 Harrison Avenue, Jersey City, N. J. 07302. Printed in U.S.A.

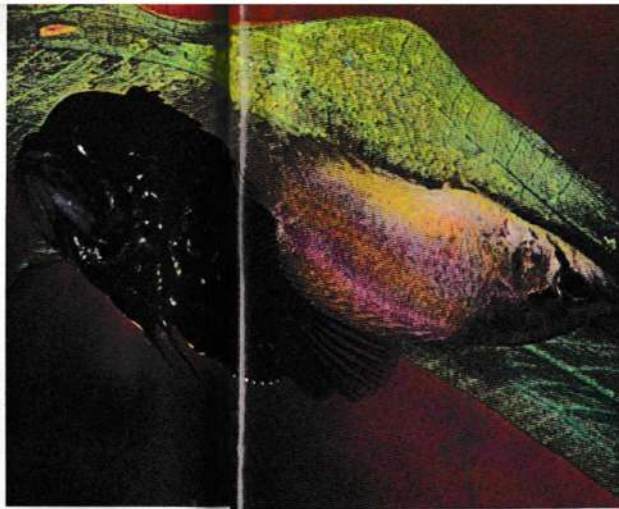


WILLIAM T. INNES 1874 - 1969

Dr. William T. Innes, whose talents as publisher and editor/writer of aquarium books and periodicals kept his name as a byword for excellence in the hobby for more than fifty years and whose personal qualities as a true gentleman earned him the affection and respect of his many acquaintances for just a little short of a century, died at his home in Philadelphia on February 27.

Dr. Innes' passing will be noted with sincere regret among hobbyists everywhere; he was a good man, and more, and we are all the losers by his death.

## Spawning

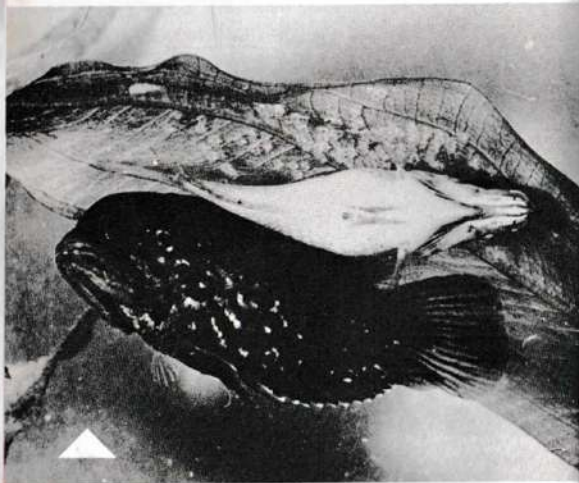


## *Polycentrus schomburgki*

◇ *Polycentrus schomburgki*, native to quiet, brackish waters of the tributaries of the Amazon River as well as to the same type of water in Trinidad, Venezuela and the western Guianas, is a truly predatory species, happily gobbling up just about any other fish that it can fit into its capacious maw . . . but a number of hobbyists appreciate the species

Wearing his nuptial finery in a colorful turnabout from his normal drab splotchy brownish pattern, the male *P. schomburgki* waits as the upside-down female attaches her eggs to the undersurface of an Amazon swordplant leaf.

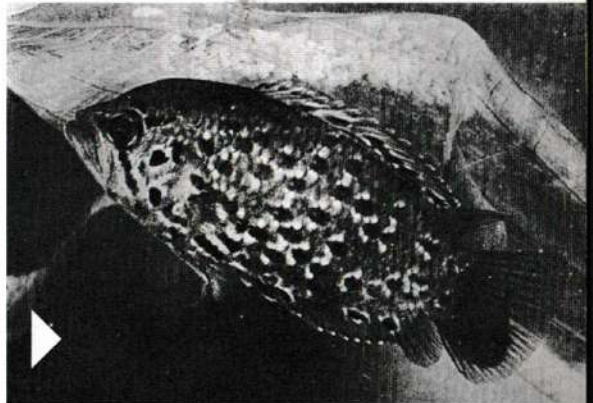
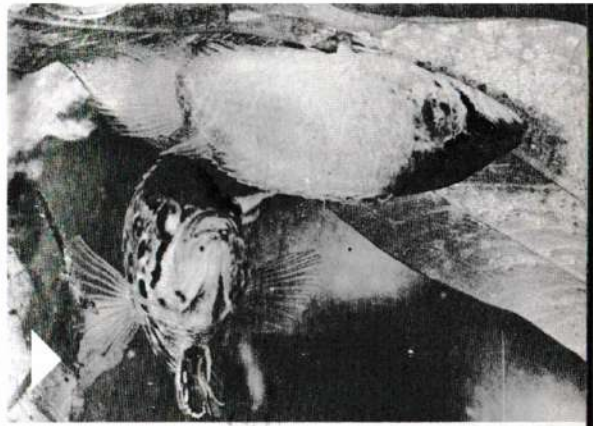
BY R. ZUKAL



The swollen abdominal region of the female is partly the result of her egg-laden condition and partly the result of the conditioning process given by the author to the parents; both male and female had received a daily portion of live guppies for close to a month before the spawning. The parent fish had not been separated during this time.

Right, above: The female is about depleted of eggs and is making her last deposit on the leaf; between four and five hundred eggs were laid at this spawning.

Below: the female has fallen away from the leaf and the male has taken over guard care for the eggs.



anyway, probably because of its interesting behavior and frequent changes of color.

The leaf fish, as it's usually called, likes a roomy tank filled with slightly saline water. The fish needs warmth, so any tank housing this species should not be allowed to fall below 70°F. It should be kept alone if possible; if it's not possible to devote a tank to leaf fish alone, keep them with harmless species at least as big as themselves.

Leaf fish take only live foods, but of all sizes and in huge quantities. Even very tiny fishes are relished. Since the species spends the daylight hours in hiding, one has to create many possibilities for concealment made up of rocks, flower-pots, and so on. The life of the species practically begins with twilight, when no fish smaller than

The normal coloration of the male leaf fish changes dramatically in comparison with that of the female during spawning; except for being lighter, the female looks like much the same fish, whereas the male darkens greatly and adds spangles of color.

itself is safe from its voraciousness. Its attacks are lightning-quick, its victims disappearing immediately in its large protractile mouth.

The male is darker, and during the spawning period the normal brown coloration turns totally black while the body is seeded with silvery blue-green dots. The female, also normally brown, becomes a lighter brown during

rule. I set up a four-gallon tank with fine gravel, filled it with normal tap water, and raised the temperature to 80°F. In the background I placed *Microsorium pteropus* that had grown on a rock. Literature had taught me that the fish spawns in caves, and aquarists generally use overturned flower pots instead, but I wanted to try my luck with a plant. From an



A young leaf fish (the specimen shown here is only a few months old) is generally paler than adults of its species but is just as ready to swallow its tankmates as they are. Photo by Stanislaw Frank.

the spawning period; her belly is much rounder than, too.

Generally I am very interested in the spawning behavior of my finny pets, and that of *P. schomburgki* certainly was no exception to the

Amazon swordplant I tore a leaf and set its stem in a bent glass tube that had the shape of a "T". Then I stuck the leaf into the gravel and anchored it fast with rocks so that it could not move any

Continued on Page 52



## Bettaphile

Frederick J. Kerr

### Show Standards

Q. Since "Bettaphile" became part of *Tropical Fish Hobbyist*, it has been the first page I have turned to in each new issue. Even though I have read everything I could find on bettas, I still have some questions.

1. What makes a champion betta?
2. Do the qualifications vary from show to show?
3. Is there a betta registration club anywhere in the world?

Sylvia Lemons  
Falls Church, Virginia

A. 1. I fear that the qualities that make a champion are the same qualities which meet the judge's prejudices. Naturally, perfection of fanage, growth and color are considered.

2. Unfortunately, in the past, each show tended to have its own standard. The International Beta

Congress has established a standard which in my opinion is the best available; the continual process of revision promises to make it better. It is based on a standard which I wrote for the November, 1963 issue of *Tropical Fish Hobbyist*. Information about obtaining copies of the IBC standard may be had by writing the secretary of the Congress at 1845 North Pulaski, Milwaukee, Wisconsin 53202.

3. There is at present no registration club for the betta, although the IBC is considering this function. Of course the problem is one of expense. It would cost just as much to register a betta as a dog. Because of the market price differences between dogs and bettas, registration may be economically impossible.

### Wild Male

Q. I recently bred my male betta. It is all red with a dorsal fin that is so short that it looks as if it has been chopped off.

1. Is this a Labby betta or is it one from the wild? I saw a picture of a wild male and it looked like mine.

2. Should the light be left on while the male is tending the eggs?

Ronald Fagg  
Morris, Illinois

A. 1. First of all, it is not correct to call every short-finned male "wild." There are very few wild bettas in this country (less than a dozen), and they are highly valued by those who own them. You only mention the dorsal as being short. If the other fins are long, this male may represent a sport for a rather unattractive dorsal fin.

2. Yes, the light should be left on so they can retrieve fallen eggs and fry.

10

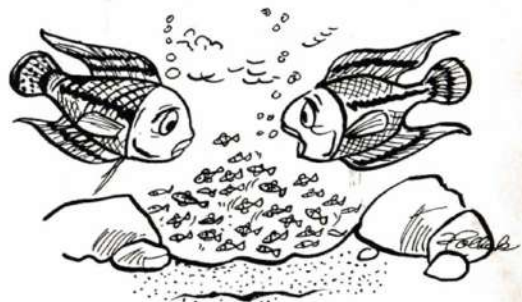
### Crape Disease

Q. My bettas have a disease that puzzles me. The fins begin to look like melted nylon and gradually, over a period of two or three weeks, they disappear. This disease seems to slow the growth, as I have some babies that got the disease and, although they are about nine months old, are only 1 1/4 inches long. Some of the drugs I have used seem to slow the disease down, but none have cured it. I have used all the following: tetracycline, chloromycetin, terramycin, aureomycin, colloidal silver iodide, malachite green, methylene blue, acriflavine neutral and penicillin. I am presently in the experimental stage, mixing some of these. Help! I have 40 jars of this stuff and it is getting expensive.

Ted Bettes  
Oklahoma City, Oklahoma

A. Although this disease, which is sometimes called crape disease, is rarely described in the literature, it is not uncommon if my mail is a reliable indication. The difficulty in finding a cure rests in part on identifying the causative agent. This is best done by microscope examination of a sample from the fins of an afflicted fish by someone with a reasonably good biological background. A doctor, veterinarian or biology teacher should be qualified to determine whether the fins are infected by a bacterium, fungus or protozoan. When this is done, a cure can be selected. My personal opinion, based on the drugs which did not work, is that the agent is a ciliate protozoan. The probable genera are *Irichodina*, *Chilodon* or *Scyphidia*. Gossington has recommended quinine at the rate of 1 grain per gallon or 4 drops per gallon of 37% formaldehyde solution.

"I can't find any more names for them, either."



11

## The Golden Ram

BY LINDA GALE

□ Shortly after my husband Danny and I acquired two pairs of the lovely dwarf cichlid known as the golden ram (a color variety of *Apistogramma ramirezi*) a rumor began to float through the hobby that these little fishes might carry a genetic "lethal factor." Whether or not this rumor proves to be founded in fact remains to be seen. Possibly this suggestion was offered because of the difficulty which some aquarists have in spawning Rams.

We question the possibility of a "lethal factor" for two reasons. Foremost, it is evident from the frequent appearance of golden rams in dealers' tanks that they do reproduce with regularity. Secondly, we have spawned the golden ram a number of times.

There is no doubt that golden rams can be spawned successfully, and there is every indication that the resulting fry can be raised to maturity with adequate care and feeding.

Perhaps the first rule for the aquarist should be simple, direct and brazen: Consider very carefully all the blanket rules that you hear or read concerning fishes. One of the most important realizations that a hobbyist may come to is that for every "aquatic rule" set down, the fishes will break two such rules!

Another "cardinal rule" for the hopeful breeder is that fishes should be maintained in the same water in which their species lives in nature, and that breeding should be attempted in the same type of water. On the contrary, we feel that, with some exceptions, fishes should be kept in water similar to that in which they were raised or to which they have been accustomed for a long period of time. In the spawning described here, for example, the water was hard and alkaline—a far cry from the soft, acid waters that duplicate native conditions for the ram.

The golden ram is a copy of his better-known cousins who are called simply rams or butterfly cichlids. Looking like pearlized gold, with fins that flutter like a hummingbird's wings, the golden ram reaches a size of

14



Although this golden ram is a poor representative of the strain, it manages to convey at least the over-all impression of the fish's appearance. Photo by Dr. Herbert R. Axelrod.

about two inches. They are colored in a tasteful balance of bright orange snout and fins which blend to a buttercup yellow over the remainder of the body. The body is overcast with a translucent iridescence, and the fins and tail are liberally sprinkled with blue spangles. The ventral fins are streaked with blue, and some narrow blue markings may appear on the body, though they are not very definitive.

The male is slightly larger than the female and may exhibit elongated first dorsal rays; he appears to be more generously peppered with blue spots on the fins and tail. The female's color is only slightly paler, and her body is a little more rounded. At most times, the female exhibits a belly region tinged pink. This pink coloration intensifies at spawning.

Our breeders were chosen because they had begun to show signs of pairing while still in the dealer's tank. The female's belly was rounded, but not as full as pre-spawning appearances.

The pair of golden rams were placed in a 10-gallon tank with one pair each of slightly smaller golden rams and a pair of dwarf lyretails, *Apistogramma klei*. The tank was equipped with an undergravel filter, two inches of natural gravel, a cave of petrified wood and a halved flowerpot, placed upside down to form a hiding place. Some water sprite and a few bunches of *Hydrilla* were planted in the tank, with floating water sprite above. The water in the tank tested at a pH of 7.8, 300 ppm hardness; temperature was maintained at 82°F. Gro-Lux lighting was used about a foot from the top of the aquarium.


15



# The ORIGINAL MIRACLE UNDERGRAVEL

**FILTER** fits in the corner of any aquarium. It is large enough to filter effectively, yet it leaves plenty of room for your plants and their uninhibited growth. A size available for every aquarium.

ASK YOUR  
DEALER FOR ONE.

 MIRACLE PET PRODUCTS, INC.,  
Box 33, Jersey City, N. J. 07303

Lit. Under Pat. No. 2,636,473

The male was seen to court the female very little, merely choosing to stay near her rather than constantly exhibit himself. Golden rams are quite shy and seem to appreciate a well-planted, dimly-lighted tank. At the first sign of the owner's approach, they run for cover in the plants and hover motionless, not even moving their pectoral fins to maintain balance.

Golden rams are bottom feeders and are quite reluctant to come out of the plants to feed when people are near. They were fed three times a day, their diet being varied with frozen brine shrimp, finely-ground beef heart, live white worms, tubifex worms, adult brine shrimp and flake foods. It was observed that the fish preferred live or frozen foods, but they did consume dry food after it had reached bottom.

I believe that when you're attempting to spawn fish, emphasis must be placed on their proper conditioning. Live or frozen foods must be offered a minimum of two times each day, with supplemental feedings of dry foods, if desired. The prospective parents should be fed until they "bulge" at each feeding, while the aquarist watches his small diners to be sure they eat what they are given and are not fed so excessively that uneaten food fouls the tank.

There is one exception to keeping a tank in all but sterile conditions. A small amount of infusoria is present in the water at all times. When a pair of fishes spawn, it is necessary to increase the amount of infusoria at once as first food for the fry. No great care is needed, but the aquarist must keep a watchful eye on the tank to see that it does not turn cloudy and remain so.

Prior to spawning, the female's normally pale pink stomach turned a slightly deeper shade and her belly was quite rounded, showing that she carried eggs. When she began to show a breeding tube, all other fish in the tank—with the exception of her mate—were removed. The pair had already chosen and begun to prepare a spawning site. The prospective parents hovered close to the shallow depression in the gravel while the other fish were removed.

When the pair were alone in the tank, they continued preparations. The spawning site was situated in the midst of a small grove of water sprite,

READ IT  
NEXT MONTH IN TROPICAL FISH HOBBYIST

## *Copeina guttata*

BY RUDOLF ZUKAL

near one end of the tank. Here both male and female cleaned the gravel in the shallow pit. Though other spawning sites were provided in the form of rocks, flower pots and coconut shells, this pair (and all of our other golden rams) have always chosen a sheltered spot in the gravel for spawning.

The actual spawning was not observed, but generalizations can be made from two previous unsuccessful spawnings of another, less mature, pair of golden rams: after a brief amount of courtship, the female began to deposit eggs, a few at a time, followed closely by the male for fertilization. Spawning took about half an hour, during which an estimated 50 to 75 eggs were laid.

The eggs were very small and slightly opaque; they were quite difficult to see on light-colored gravel. They appeared to be placed about three or four eggs to each larger piece of gravel, roughly patterned in the circular depression. Only with the aid of a flashlight could the eggs be easily seen, and then no true estimate of their number could be given.

Although I believe that well-mated, well-fed fish, once accustomed to reasonable outside-the-tank activity and noise, will probably not panic and eat their young, it is wise to take precautions against alarming spawners. When you're near the tank, move slowly . . . and don't get too close.

After previous unsuccessful spawnings of a younger pair of golden rams, we had little hopes that the first spawns of the older pair would be fertile. In all, we had spawned golden rams five times, and the eggs had been eaten shortly after each spawning. No aquarist should despair when this occurs with young breeders. In all probability, the pair will eventually begin to raise family after family, though several spawnings may be eaten before this good fortune happens.

The younger pair of fishes (who always immediately ate their eggs) were not quite so compatible as the older pair of golden rams. As stated so often before, successful spawnings quite often depend on the ability of the parent fish to get along with each other. When they are allowed to choose their own mate, they are much happier, and success is much more likely.

By the end of the second day after spawning, our hopes had begun to rise. We noted that very few of the eggs had fungused, perhaps a maximum of 10% of the total. But, as expected, the eggs had been eaten by the third day.

Approximately 10 days later, the pair spawned again, with the same results. Conditioning of the parents continued with dogged determination.

Two weeks later, we were greatly surprised to see about 75 free-swimming fry hovering about their parents! We had noted that the parents seemed much more secretive about their activities, but we were never able to locate any eggs until we later discovered their "hiding places."

Exceptionally tiny, like slivers of glass, most of the fry hovered near the base of plants near the parents, though many of the young began to stray in search of food.

**GOOD NEWS  
FOR GARDEN POOL OWNERS  
EXCLUSIVE! Economy Combination saves you  
money on purchase of separate units!**

# Supreme POOLMASTER

**THE ONLY UNIT THAT  
BOTH FILTERS and CIRCULATES  
WATER IN GARDEN POOLS!**

**New Combination Filter and Pump  
Keeps Garden Pools Clean and Fresh!**

There's nothing else like it, anywhere! The Poolmaster is a filter and pump combined, that is designed for use in all kinds of outdoor and indoor pools, including ponds, goldfish pools and fresh water minnow tanks.

The Poolmaster is placed at the bottom of the pool completely submerged and out of sight. Water is drawn through the filter and returned to the pool by the pump. Because the Poolmaster is so compact, it can be easily moved to all parts of the

pool to pick up any accumulation from the bottom.

With the Poolmaster, you can create your own beautiful waterfall or fountain by simply connecting a hose to the pump outlet.

The Poolmaster is quality-built by the foremost manufacturer of aquarium and pool products. It is constructed to give you superior, trouble-free performance year after year. Supreme materials and workmanship are guaranteed against defects for one year from date of purchase.

**SPECIFICATIONS**  
115 V 60 Cycle  
1 1/2 hp. motor  
— draws 200 watts  
— pumps 100 gals./hr.  
— weighs 5 lbs.  
— size 13 1/2" x 10 1/2"

EUGENE G. DANNER MFG. INC. 1660 Summerfield Street • Brooklyn 27, N. Y.

Feedings of a liquid fry food and finely-powdered dry food were begun. About 14 drops of the fry food were added to a small amount of water, stirred to mix, then poured through the tank, the main concentration of food being applied directly over the school of tiny fish. The young were fed every two to three hours and were left with the parents.

It is accepted that fry grow best if left with their parents for two weeks before transferring the young to a tank of their own. Parental care of young cichlids is an aquarist's option. Hazards are involved, as the parents may turn on their brood for some inexplicable reason. They may also decide to spawn again, with equally disastrous results. However, we felt that the risk was worth it.

Rather than the usual "mother hen" attitude of most cichlids, the parents seemed rather lax in their care of the young. They remained in a tail-to-tail guarding position most of the time, and most strays were allowed to wander, rather than being immediately picked up and spat back into the school as with larger cichlids. The parents' duties seemed to be confined to keeping a watchful eye out for any possible intruders.

Most of the fry remained with the female. At one time, when the female was feeding, the guarding male rushed up and nipped her, as if to remind her that she had maternal duties.

When the young were about five days old, a slight altercation occurred between the parents, and I feared that all-out war might be declared and the spawning lost. Both male and female were guarding the fry. The female was resting against the bottom, apparently "asleep." Then the male nipped

SMITHSONIAN INSTITUTION  
Washington, D. C. 20560

The Smithsonian Institution and T.F.H. Publications, Inc. are pleased to announce the publication of a reprint, including the color plates, of the Philippine Bureau of Science's three Monographs on Philippine fishes: No. 1, Jordan and Richardson's Checklist, 1909; No. 23, A. W. Herre's Gobies, 1927; and No. 24, Montalban's Pomacentridae, 1927. These rare historical works are available in a clothbound volume for \$5.50.

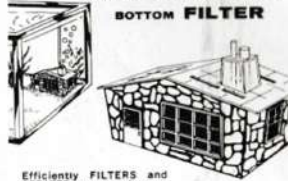
Two earlier numbers in this reprint series are: Jordan and Evermann's "The Fishes of North and Middle America," U. S. Nat. Mus. Bull. 47, Vols. 1-4, 1896-1900, \$25.00; and Smith's "The Freshwater Fishes of Siam or Thailand," U. S. Nat. Mus. Bull. 188, 1945, \$3.50.

Orders for these books, accompanied by remittance (postpaid) should be addressed to:

Publications Distribution Section  
Editorial and Publications Division  
Smithsonian Institution  
Washington, D. C. 20560

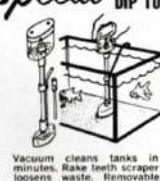
**EUREKA**  
Assures More Healthful Aquariums!

**RANCH HOUSE**  
BOTTOM FILTER



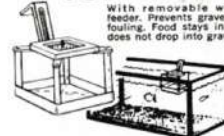
Efficiently FILTERS and AERATES any aquarium up to 10 gal. in size.

**Speedi** POWER DIP TUBE



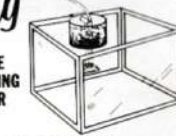
Vacuum cleans tanks in minutes. Rake teeth scraper loosens waste. Removable strainer prevents gravel pickup.

**"FEED-KLEEN"**  
PATENTED  
FOOD TRAY




With removable worm-leader. Prevents gravel bed fouling. Food stays in tray, does not drop into gravel.

**Tidy**  
INSIDE HANGING FILTER




Self-starting, high power action. NO SIPHON NEEDED. Works at low water levels. Easy to clean.

**Handee**  
HAND PUMP and AUTOMATIC SIPHON



for transferring aquarium water.

**FILTER FLUFF**



Special filtering material. Contains no glass fibers, no irritations from handling. Proven protection for all fish.

manufactured by **EUREKA** PRODUCTS CO. 4 Breen St., Newark, N. J.  
**WORLD'S FINEST AQUARIUM PRODUCTS**  
IF YOUR SOURCE IS UNABLE TO SUPPLY YOU, WRITE FOR INFORMATION

it be seen that they were actually tiny fish. At the end of the third day, the parents moved the fry to a second shallow depression in the gravel, and it was from this place that the fry began to free-swim approximately four days after hatching.

In this second successful spawning, it was noted with some surprise that the male did most of the caring for the fry during the time between hatching and swimming. He also assumed most of the responsibility for guarding for the young once they had begun to swim. The female's services were dismissed without malice, but she remained nearby and did assist when allowed. Quite often, half of the fry remained near the male, while the others stayed close to the female.

When it was first noted that the fry had hatched, each day about ten drops of liquid fry food were mixed with water and poured into the tank in the area of the "wigglers." I consider this standard procedure for raising cichlid fry and use either liquid or powdered fry food, depending on the size of the young fish. (The fry of larger cichlids are offered the dry food.) Only a tiny pinch of powdered food is used once a day. The addition of fry food before the young begin to swim greatly increases the infusorian population, and the fry, even before free-swimming, are seen to pick at the bottom, evidently feeding on the tiny particles of food which have settled there.

By the time they were three weeks old, the first spawning of golden ram fry were about the size of new-born guppies and had tripled their hatching size. Continuously active and hungry, they were fed freshly hatched brine shrimp and powdered dry food, alternated with frozen and freeze-dried baby brine shrimp and daphnia—though their palates were definitely more pleased with live shrimp. There were approximately 60 fry in the first spawning. The second spawning appears slightly larger, though it is difficult to give a reasonable estimate.

We consider success with the golden ram attributed to several things, and I offer the following as good rules to follow in keeping and breeding cichlids in general and golden rams in particular:

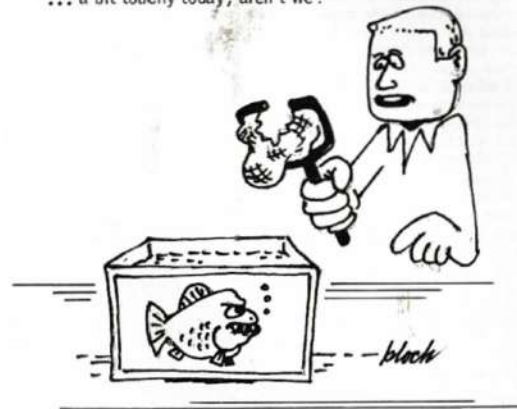
1. Let prospective parents pair naturally for best results.
2. Don't fiddle with water conditions. If your fish appear happy and colorful in water right out of the tap, let several months pass, if necessary, before you make any alterations.
3. Choose young, just maturing fish for breeding, then condition them through maturity.
4. Feed prospective breeders well and often.
5. Never break up a well-mated pair, and do not move the breeders. Take a chance on moving the fry before moving the adults, once they have become accustomed to their home.

6. Keep water temperature for spawning a few degrees higher than normal.
7. Most important, try to understand the fish that you keep. If, for instance, they appear shy and uncomfortable in bright light, reduce the amount of light in their tank. Respect their needs and you will benefit.

Little success, if any, can be expected if golden rams are kept among others in a community tank. We noted that, under the same water conditions, temperature and tank size, the second pair of golden rams that we own have not shown the slightest inclination to spawn. The female has never filled with eggs, but we know that these fishes are capable of reproducing, as evidenced by two previous unsuccessful spawnings.

Golden rams are lovely, peaceful little fish that deserve to be taken out of show tanks and placed into breeder tanks! ■

"... a bit touchy today, aren't we?"



## Those Satisfying Swordplants

◇ One of my hobbyist friends is a music teacher who asked me to explain the term "genus" to him. It took about ten minutes before I hit on the idea that members of a genus vary not so much in kinds of characteristics as in the degree to which they express those characteristics. "I think I see," he said. "The species of a genus are all variations on the same theme." He got the concept, and I'm finding more and more in Brahms' *Variations on a Theme by Haydn*.

If a genus is a set of variations, the plant genus *Echinodorus* is a veritable symphony of vegetable beauty. Here we find variations in size, color, growth habit and leaf form, all united under the characteristics of the swordplants. The genus is found from the central and southern United States through Central America and the Caribbean and most of South America. There are even a few species in Africa, but these are of small interest to the aquarist.

There are at least 22 named *Echinodorus* species and a host of

BY FREDERICK J. KERR

subspecies. If the changing nomenclature of fishes is frustrating to the aquarist, the problems of identifying swordplants is downright outrageous. Not that the botanists are at fault: the swords just won't be organized to suit our ideas of clearly defined species. Many of the swordplant species are extremely variable in form. The form of the leaves of a given species may look one way in one part of the species' range and very much different in another part; in addition, the looks of a swordplant species vary also according to the amount of light received and the characteristics of the water in which it lives. Fortunately for botanists, the flowers of the swordplants are much less variable than the leaves, and it is to the flowers that the botanist turns to identify the plant in question. If this is fortunate for the botanist, it is un-

fortunate for the hobbyist, because his swords rarely flower, making identification chancy at best. The identification aid presented here is designed to minimize the difficulties in identification of the more common species but, alas, it is not perfect.

The cultivation of the swordplants is not especially difficult. The smaller sorts, often called chain swords, can be planted directly in the aquarium gravel. The larger types should be potted for best growth. A good soil can be made of the potting soil used for house plants, mixed with some crushed clam shell or marble chips. These prevent the pH of the medium from becoming acid, a condition not preferred by the swords. Naturally, this soil must be covered with aquarium gravel to prevent it from being spread all throughout the aquarium.

In practice, water conditions present little difficulty in the cultivation of swordplants. Soft water is optimal, but most species will do well in hard water. An alkaline pH is preferred, but if the rooting medium is alkaline or neutral, the plant will tolerate acid water fairly well. Temperature preference varies from species to species; those species from the United States prefer the temperatures generally found in goldfish tanks, and the others thrive in tropical temperatures. Moderate to strong light is required by all species.

In nature swordplants almost invariably grow in swamp conditions. Here the plant either grows in very shallow water or with the leaves in the air. In all cases flowers are produced above water which give rise to berry-like achenes. In some of the largest species, this is the only form of reproduction. The smaller species nearly all produce runners profusely.

Propagation in the aquarium is a somewhat different matter. Few if any of the genus will flower success-

Continued on Page 36

26

27

## THE AQUARIUM CLUB OF AMERICA

### NEW LIFETIME MEMBERSHIP

The Aquarium Club of America is now offering a lifetime membership for only \$10.00. Buy from Participating Retailer stores located all over the U. S. Buy in person or mail order. Quality and live delivery guaranteed. No limit necessary to remain a member. Buy nationally-advertised foods, accessories, filters, books, pumps, heaters, beautiful aquarium plants, live foods, rare tropical fish.

### GUPPY SPECIAL CHAMPION STOCK VEILTAILS

Your choice of Blue, Red, Green or Multicolored  
1st pair \$5.00  
each additional pair \$2.50  
Limit 5 pair per order.  
This price includes airmail postage and shipping containers!  
Guaranteed Live Delivery

A lifetime membership includes a subscription to ACA NEWS. Write now for free copy. Don't be left out. Join the exclusive club of professional hobbyists.

DON'T WAIT — JOIN NOW — FILL OUT THE COUPON AND MAIL TODAY. IF YOU ARE A TROPICAL FISH HOBBYIST, YOU CANNOT AFFORD NOT TO JOIN THE ACA!!!

Aquarium Club of America, Inc.  
712 Washington Boulevard  
P. O. Box 157, Belpre, Ohio 45714  
Gentlemen: Please enroll me as a MEMBER in the Aquarium Club of America. Enclosed are my LIFETIME dues of \$10.00, plus \$\_\_\_\_\_ for \_\_\_\_\_ pair of guppies as offered in the Introductory Guppy Special.  
\_\_\_\_\_ Blue \_\_\_\_\_ Red \_\_\_\_\_ Green \_\_\_\_\_ Multicolored  
Name \_\_\_\_\_ (Please Print)  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

## YOUR FISHES' HEALTH

### PREVENTION

By  
Roger  
Lee Herman

□ Do you prevent the occurrence of disease in your aquarium? We go to the doctor and get shots which protect us from certain diseases. We spend a little money and time for the shot so we will not lose a lot of time and money by having the disease. We do the same for our dogs and cats. Why not for our fishes?

Unfortunately, we cannot, as yet, vaccinate our fishes, but there are things we can do to preserve their health. Everyone knows that their fishes must be fed the proper foods and not too much nor too little. We know that the water temperature, pH and hardness must be kept at certain levels, and the water must be well aerated. Too often this is not enough.

I have seen many cases of disease in aquaria where the owner was doing all of these. Frequently, these outbreaks could be traced to the addition of new fish, plants, snails or ornaments. The majority of these outbreaks could have been prevented. A new fish is brought home

in a plastic bag with some water from the aquarium shop. The bag is floated in the home aquarium to allow the water to reach the same temperature as in the aquarium so the fish does not suffer from temperature shock. After a while the bag is opened and the fish and water dumped into our aquarium. What if water from the bag contains disease organisms or the fish is infected but does not look sick?

CLEAN AQUARIUMS  
ONE HAND OPERATION  
LARGER VALVES  
LONG LIFE  
GUARANTEED



IS THE ANSWER  
MILLIONS OF FISH  
AROUND THE WORLD  
ARE HEALTHY BECAUSE OF

Guppy CLEAN AQUARIUMS

SOLD BY FINE DEALERS AND  
DISTRIBUTORS EVERYWHERE  
FREE CATALOG

FRAMAR MFG. CO.  
2958 ALLA ROAD LOS ANGELES CALIF. 90044

29

Would you allow a typhoid carrier to swim in your swimming pool?

Put new fish in a separate container and quarantine them before putting them into your community tank. In most cases, a one-gallon container is quite sufficient. It can be a regular aquarium or a wide-mouth jar or even just a bowl. Aeration may be necessary, depending on the size of the container and the fish. Filters are not desirable in quarantine tanks, especially if chemical treatments are used.

The new fish should remain in the quarantine tank for at least one week and be observed for signs of disease. This time can be shortened a little by using a drug such as acriflavine, methylene blue or even salt. These are effective treatments for many external parasites, and these parasites are the most common problems brought in with new fish.

When the quarantine period is up, the fish can be transferred with a net to the community tank. Take care

to drain as much water as possible from the net.

Plants and snails should also be quarantined before they are placed in the home tank. Potassium permanganate seems to be recommended most often for disinfection of plants. One fifth grain (26 drops of a 1% solution) to a gallon of water is recommended. The plants are left two or three days. Stronger solutions for shorter times can be used, but the weaker solution is probably better.

Snails can usually be treated like fish. It is not safe, however, to use



**Water Lilies  
Aquatic Plants**

Grown indoors  
will thrive  
in your tanks.

\* FREE CATALOG \*

\* Otto C. Beidt  
Bee Fork Water Gardens  
Rt. 5 - Box 33  
Bunker, Mo. 63629

Please Mention T. F. H. When Writing to Advertisers

**Ed's Tropical Aquarium**

FEATURING: Ed's Multi Line.  
A full line of the most effective  
medications on the market today  
and many varieties of Killifish  
(foremost breeders of Killifish in U.S.A.)

**ED'S TROPICAL AQUARIUM**  
★★★★ 4 LOCATIONS TO SERVE YOU

When in New York come in.  
See our newest most modern  
aquarium facilities.

- LYNBROOK, N. Y., 2 Scranton Avenue — 516 - LO 1-7273
- FOREST HILLS, N. Y., 63-53 - 108th Street — 212 - 897-3121
- FARMINGDALE, N. Y., 9 Hempstead Turnpike — 516 - MY 4-0515
- ROOSEVELT FIELD, N. Y., Garden City — 516 - 248-3705

Write to our  
Lynbrook office  
for prices.

copper chemicals with snails.

Ornaments must be made from materials which are not harmful to fish. One should be very careful in selecting any cheap plastic ornaments such as flowers. These may contain water-soluble poisons. It is best to buy ornaments only from the aquarium shop.

Remember, a little time and effort spent in prevention can save much time and many valuable fish.

**Bulk Tropical Fish Food**

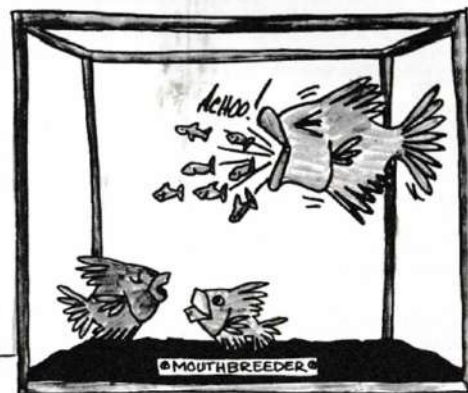
The one true purpose direct from Canada's largest and oldest producer of guaranteed pure 75% Protein Tropical Fish Foods. 100% Organic with no fillers, is made of the best, composed of small fish, shrimp, crab, fish liver, eggs, etc., renders natural food ideal for tropical or salt water fish and used by top breeders for years.

**SPECIAL MAIL ORDER OFFER**

3 ONE POUND BAGS FAMOUS VARIETY PACK \$10.00 POST PAID AND DUTY FREE. OR  
1 ONE POUND BAGS GUPPY FOOD \$10.00 POST PAID DUTY FREE. OR  
ONE POUND GUPPY FOOD \$2.50 POST PAID DUTY FREE.

American Shrimp and Methylene, special prices \$2 lb. bags shipped duty free. Send for descriptive price list.

Hart & Howes Ltd. 569-Stevenson Highway  
Richmond, B. C., Canada Tel. (604) 277-4228



"TERRIBLE TIME FOR HER  
TO GET A COLD!"

**Swordplants**

Continued from Page 27

fully under aquarium conditions. Many species do, however, produce flower stalks which, instead of producing flowers, produce young plants. These stalks are not the same as the runners of the chain swords. The runners grow horizontally to the soil and thus allow the young plants to root. The abortive flower stalks, on the other hand, tend toward a vertical growth, which sometimes puts the young plants completely out of the water. The usual procedure is to weight the stalk down until the young plants have rooted before cutting them free from the stalk.

A few of the showiest species refuse to put out even abortive flower stalks. As a result, they are difficult to propagate. Occasionally a young plant will appear at the base of the plant and can be removed when it is about one-third the height of the parent. Another method of propagation which is seldom used by aquarists is to cut as much of the root stalk from a mature plant as possible and then plant the root stalk. If the stalk is large, it can be cut into one-inch lengths and planted. A plant or two usually starts from each section in a few weeks.

During the early years of our hobby the pygmy chain sword-plant, *Echinodorus tenellus*, was known as *Sagittaria microphylla* because of its narrow leaves and



*Echinodorus tenellus*



*Echinodorus magdalenensis*

method of producing runners. When it bloomed, however, the presence of both anthers and pistils in the same flower put it in the genus *Echinodorus* rather than in *Sagittaria*, which has only one or the other in any one flower. This is a wide-ranging species found from Massachusetts to Florida and in South America from Venezuela to Paraguay and the Caribbean islands.

Partially as a result of this wide distribution, there are many subspecies, of which the pygmy chain sword, *E. tenellus* var. *latifolius*, is of perhaps the most interest because its leaves are somewhat broader than the normal variety. The pygmy chain sword is valued in larger aquariums for its ability to form attractive carpets over the foreground sand.





*Echinodorus cordifolius*

The chain swordplant, *Echinodorus magdalenensis*, was known for a time as *E. intermedius* and then as *E. grisebachii*. Like the pygmy chain sword, the chain sword is capable of forming lawn-like mats in the largest aquariums. If the runners are clipped back, the plant soon forms a specimen plant with as many as 50 leaves. This Colombian plant has a broad and a narrow leaf form, depending largely on the amount of light received.

The radicans swordplant, *Echinodorus cordifolius*, has been known as *Sagittaria guayanensis*, *S. radicans* and *E. radicans*. The name change to *E. cordifolius* leaves the plant with an erroneous common name. This is the most common of the



*Echinodorus nymphaefolius*

swords with heart-shaped leaves. Younger leaves are nearly oval in shape, becoming more heart-shaped with age. The blade is usually carried at an angle to the petiole, often displaying the top surface of the leaf parallel to the light source. The plant has a great tendency to produce aerial leaves. This plant is native to the United States and Mexico.

The cellophane swordplant, *Echinodorus berteroi*, has gone under a host of names, including *E. rostratus*, *E. nymphaefolius* and *E. cordifolius*. This species is found from the southern United States through the Caribbean and through

out Central America. This species is heterophyllous, producing three distinct types of leaves. The youngest leaves are ribbon-like, while older leaves are much broader. The oldest leaves are oval and float like waterlily pads. This is seen in a number of *Apogon* species as



*Echinodorus berteroi*

well as in the true *E. nymphaefolius*. The translucence of the leaves makes this a most attractive plant.


The Amazon swordplant, *Echinodorus brevipedunculatus*, is a Brazilian species which has great popular appeal and is perhaps the most frequently seen of the larger swords. This species is sometimes confused with *E. paniculatus* var. *gracilis*. They can be differentiated by carefully observing the leaf veins. Although they have the same number of veins, the side veins branch from

<sup>much</sup>  
**Sometimes you get more than you pay for.**

Take a Miracle Robin Heater. It has all the parts that the most expensive heaters in the world have. It is fully covered by a guarantee by one of the largest companies in the pet industry. It has a Pyrex heat-resistant tube. It has a full ceramic nichrome heating unit. It has a calibrated adjustable head. It is fully automatic and has a built-in thermostat. All you do is plug it in, turn the dial until the light goes on and

forget about it. What do you get for nothing? Peace of mind that you have purchased the best heater made for the least amount of money. Miracle sells it cheaper because we produce almost 450,000 parts for all of our heaters . . . that's mass production! Buy the best and pay the least with a Miracle Robin. Available at pet shops only. (Also available in 220 volt for export.)



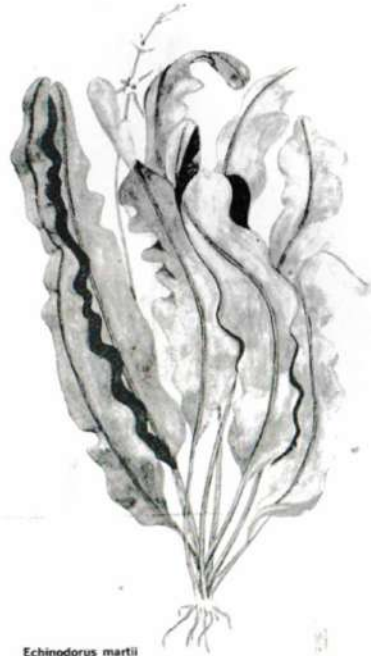
**... more than a** 

MIRACLE PLASTICS (N. J.) CORP., Box 33, Jersey City, N. J. 07303  
Export Inquiries: MIRACLE PLASTICS EUROPA N.V., Waalhaven Z.z.40, Rotterdam, Holland



*Echinodorus longistylus*

the main vein differently. Those of *E. paniculatus* var. *gracilis* all originate at the very base of the leaf, while some of the veins of *E. brevipedicellatus* branch about a quarter of the way up the main vein. The melon swordplant, *Echinodorus longistylus*, is a Brazilian form prized for the unusual coloring of the young leaves. These are crimson red until nearly half grown, when they slowly start to turn pink and finally green. The leaf veins are lighter in color than the leaf blade, making this a very showy species. The ruffled swordplant, *Echinodorus martii*, is one of the most



*Echinodorus martii*



*Echinodorus paniculatus*

spectacular of the swords and requires a large aquarium. The leaves are exceptionally leathery and stand a great deal of knocking about. Some authors report that this species becomes smaller in acid water. Some authorities divide *Echinodorus paniculatus* into two varieties: *gracilis* and *rangeri*. Others maintain there are two species: *E. paniculatus* and *E. rangeri*. Whichever faction is correct, there are two distinct forms, one narrow-leaved and one broad-leaved. This species is often confused with *E. brevipedicellatus*. A beautiful aquascape can be created using the various species of swords exclusively, although a large tank would be necessary to give the larger species ample room for growth. For background plants either *Echinodorus brevipedicellatus* or either of the two varieties of *E. paniculatus* could be used. *E. longistylus* or *E. martii* would provide distinguished center plants, with *E. cordifolius* or *E. berteroi* as side plants. *E. magdalenensis* would be effective as a midground plant and *E. tenellus* over the foreground. Fishes for such an aquarium would be no problem. Any of the host of South American tetras, catfishes and cichlids would make excellent companions for those satisfying swordplants.

**Leaf Characteristics of Several Species of Echinodorus**

Scientific Name	Common Name	Number of Leaf Veins	Leaf Length	Leaf Width	Stem Length
<i>E. tenellus</i>	Dwarf Chain Swordplant	1 or 3	4"	1"	1"
<i>E. magdalenensis</i>	Chain Swordplant	1 or 3	6"	1 1/4"	2"
<i>E. cordifolius</i>	Radicans Swordplant	5, 7 or 9	5"	3"	4"
<i>E. berteroi</i>	Cellophane Swordplant	3, 5 or 7	10"	1"	4"
<i>E. brevipedicellatus</i>	Amazon Swordplant	3 or 5	17"	1 1/4"	4"
<i>E. longistylus</i>	Melon Swordplant	5, 7 or 9	9"	4"	12"
<i>E. martii</i>	Ruffled Swordplant	5, 7 or 9	16"	4"	12"
<i>E. paniculatus</i> var. <i>gracilis</i>	Narrowleaf Swordplant	3 or 5	14"	1"	8"
<i>E. paniculatus</i> var. <i>rangeri</i>	Broadleaf Swordplant	3 or 5	16"	3"	10"

**TROPISOL**   **TROPICAINE**

**TROPICAINE POWDER**

**WARNING:**  
**NOT FOR FISH**  
**KEEPERS AFFLICTED WITH**  
**HYPOCHONDRIASIS\* REGARDING**  
**THEIR FISHES' HEALTH.**

**FLOCCULANT**  
**TRANQUILIZER**  
**WATER CLARIFIER**  
**STERILIZING AGENT**  
**BACTERIAL INHIBITOR**

Some people enjoy the hobby because they love "doctoring." The warning above is for these people. If you love "doctoring" more than you love "hobbying" — then please observe the warning. Douglass pharmaceuticals end "doctoring"! They hit the bulls-eye in the curing of fish diseases. We're too modest to say so, but — some people have called our medicaments the new space age concept of treating fish disease.

\* **HYPOCHONDRIASIS**  
 a word meaning morbid anxiety about one's health.

**DOUGLASS FILTRATION SYSTEMS, INC.**  
 148 Winkles - Elyria, Ohio



## Polycentrus

Continued from Page 9

more. After two days, when the water had aged sufficiently and the temperature was settled, I introduced the pair of breeders. At first my leaf fish were very shy. They hid in the plants in the background and did not take any food for two full days. It took still a few more days until the fish would accept the offered worms normally again, swallowing them in large chunks. But more and more time passed without my expectations coming true. My patience was being sorely tried. I have to confess, though, that the error had been my own, for the female was not "full" enough. When a fellow fancier confirmed this opinion, I started offering the breeders a daily ration of four to eight guppies.

Nearly four weeks had elapsed in this way until I finally noticed the potential "father" beneath the leaf.

The female in normal position, prior to turning over and depositing eggs on the leaf. Her ovipositor is plainly visible immediately behind the ventral fins.



The male turns slightly on his side and releases clouds of sperm, which rise and fertilize the eggs. The eggs are not arranged in a regular pattern.

In their reports several authors report that the male carefully cleans the spawning substratum. This may be true, and I shall not dispute it, but the only thing I noticed was that the male remained beneath the leaf for hours on end, occasionally opening its mouth very broadly and making short sallies against the female. During these he used to ram her in the belly. When the female too set up her abode under the leaf, at the male's side, the latter trembled all over, and his color became darker. While the male became darker and darker, the female became lighter and lighter. Only a dark spot at the rear of the head and the protruding ovipositor were visible on the female. The male became restive and rammed the female lightly in the belly region. Gradually the male turned black, and the female, too, started to show an interest in the leaf. She probed it with her

# we did it!

Up to now, the only way flake food could be made was with lots of air so a fish could gobble up a big piece and fool the hobbyist into thinking the food was delicious when actually the fish was starving because he was eating air!

Miracle did it again. Our see-through can of fish food is about the same size as other fish foods in flake form, BUT LOOK AT THE NET WEIGHT ON THE CAN.

And look at the assortment! We made flakes out of algae for mollies and livebearers that need vegetable matter in their diet; we made flake food out of brine shrimp because all fish love brine shrimp and it's good for them; we made flake food out of tubifex worms because that's another fish favorite and has been proven to be an extremely nourishing food over the years. Then we mixed them all together in daily diet, plus some other goodies, and made the best flake food range we could.

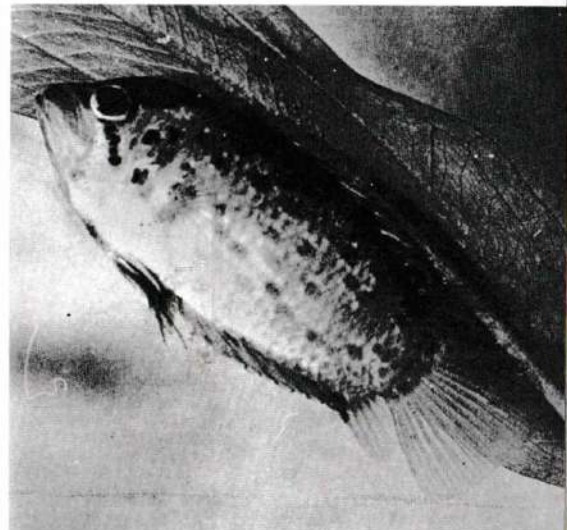
Dr. Herbert R. Axelrod developed and tested this line of foods for us, and it is the only fish food in the world authorized to use his name on the label. **MIRACLE PET PRODUCTS, INC. BOX 33, JERSEY CITY, N. J. 07303**

Expert Inquiries to MIRACLE PLASTICS EUROPA N.V., Waalhaven 22-40, Rotterdam, Holland



Available at pet shops.

April, 1969



The male, which has not yet taken on the deeply intensified spawning coloration, guards and inspects the leaf chosen as the spawning site.

mouth, then turned on her back and released the first eggs. While the female laid her eggs, the male pressed beneath them, quaked a little with his whole body and fertilized the eggs in this position. The sperm is lighter than the water and rises among the freshly

extruded eggs. The male does not turn belly up like the female or in the manner known from many of the cichlid species.

After many repetitions of the copulative act, the spawning was completed; the whole thing took around three hours, during which

# INTRODUCING The All PLEXIGLAS SALT WATER AQUARIUM

THE ONLY SAFE WAY TO HOLD SALT WATER FISH!

**50 Stock Sizes  
10 Gallon To 1250 Gallon  
With A 5 Year Guarantee**

SHIPPED TO YOU IN WOODEN CRATES  
GUARANTEED BY US!

**U.S. MADE**

AVAILABLE FOR  
IMMEDIATE DELIVERY

**F.O.B. N.Y.**

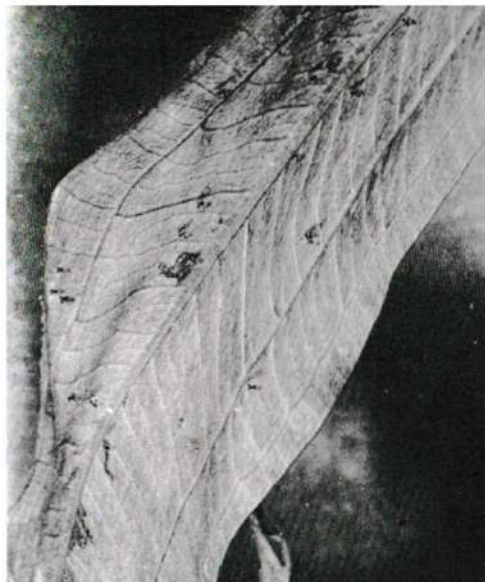
ALSO AVAILABLE: "SUPERSTAND"- made from one inch square steel tubing, in Chrome Finish or Baked Enamel. Models to support 10,000 lbs.  
SHORTLY AVAILABLE: "OZONATORS" - 500 & 1,000 gal. per hour outside filters,  
AND MANY NEW PRODUCTS TO COME .....

## JHG ENTERPRISES LTD.

JOBBERS AND DEALERS  
WRITE FOR INFORMATION!

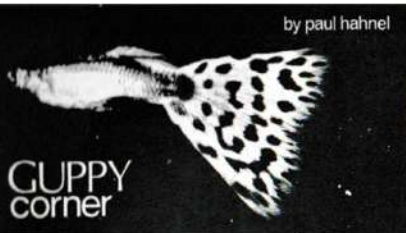
92-31 57th AVENUE  
ELMHURST, N.Y. 11373  
PHONE: 212 271-5676

CABLE ADDRESS:  
AMAZONIA, NEW YORK  
JAGUARIND, NEW YORK



Some of the newly hatched babies adhere to the leaf; youngsters that hatched before those shown in this photograph have already fallen from the leaf to the bottom of the tank.

about 450 eggs were laid. I removed the female, and the male took charge of the eggs. The eggs hatched in 48 hours; at first the fry hung to the leaf, but they later fell to the bottom. After they had fallen to the bottom, I removed the male and started a gentle aeration with small bubbles. The young became free-swimming on the seventh or eighth day. They consumed a great deal of food, and growth is quick. ■



by paul hahnel

**GUPPY  
corner**

### Baby Management

Q. 1. How many male and female guppies can live comfortably in a 10-gallon tank?

2. When is it safe to put baby guppies in the same tank with adult fishes?

3. I have been putting baby guppies in with the grown fishes between the ages of two to five weeks, but about a week after each transfer I find some of the babies have died. I always make sure they are strong and healthy before I put them in with the other fish. Why does such a thing happen?

Theresa Anne Novack,  
Stamford, Connecticut

A. 1. Four males and 10 females would be safe for a 10-gallon tank, but remember that gravel, other solid objects and water level have an effect on tank volume. If you provide correct filtration and aeration and otherwise provide optimum living conditions you can keep a greater number of fish.

2 and 3. Generally speaking, two-week-old baby guppies can be transferred from their birth tank to a tank with adults if the water conditions in both tanks are fairly close. Transferring babies to a tank with very different water conditions can often result in the loss of all or part of the batch of babies. This may, in fact, be the

### DELTA TAIL GUPPIES

Quality fish from trophy-winning stock. Healthy guppies with excellent color from large bodied delta tail strains.

Guaranteed to breed true.

Green Cobra Deltas, \$15 pair \$20 trio

Blue or Green Deltas, \$10 pair \$14 trio

FISH SHIPPED ARE 3 TO 4 MONTHS OLD

GUARANTEED LIVE DELIVERY

POSTPAID AIR MAIL SPECIAL DELIVERY

Send check or money order to:

GLEN L. PARRISH

10032 McLENNAN AVENUE

GRANADA HILLS, CALIF. 91343

Phone 363-5563

FIRST PRIZE WINNER AT THE INTERNATIONAL 1960 GUPPY SHOW,  
BERLIN, GERMANY

### THE BRONZE DELIGHT

After more than 30 years of breeding exhibition guppies, Mr. Hartung now introduces his greatest achievement — the Bronze Delight with its large Vail-tail breeds true. They are a fine hybrid of golden and grey guppies. You may choose from Green, Leopard, Blue, Variegated or Blue-green tails. \$14 per pair, \$5.00 extra for Trio.

HARTUNG GUPPY SPECIALIST

Other prize-winning varieties are your choice of Red, Blue, Black, Dark Blue, Variegated — only \$6.50 a pair; Albino Vails, \$8 a pair; Beautiful Green Body and Vails SP a pair; GUARANTEED live delivery — Postpaid. Send check or money order to WM. HARTUNG, 91-34 - 88th St., Woodhaven 21, N. Y. — VI 7-2528.

April, 1969

reason you are losing some of your babies after they are transferred to another tank.

### Color in Females

Q. I have kept guppies for the past year and a half. My fish have bred regularly all the time I've had them, but I have not culled any of the babies they have produced. Lately I have noticed that some of the females have developed color in their tails. The color is red or yellow-red, and although not intense, the color is immediately noticeable. Some of my females also have black marking in their tails. Can you tell me:

1. Will the color increase in future generations?
2. What breed of guppies are these?
3. What males will be best for increasing color?
4. What books should I get for further information?

Debbie Stuart,  
Zionsville, Pennsylvania

A. 1. There are many females of the type you describe. If you want to increase the color of the fish you breed you must always select breeding individuals that show this trait most strongly.

2. Red-colored tails in females do not indicate any special breed.

### THE EMERALD COBRA

(Banshiki Guppy)

The Ultimate in a Green Cobra Delta. Males have green snakeskin pattern on body with white tails. Large, prolific females are light colored with green cast. Guaranteed to breed true. \$14.00 per pair \$5.00 extra for trio. Also available in blue.

Other varieties include Turquoise Green, Mosaic and Red Delta, Orange Tail Delta, Blue and Red Delta, Orange Tail Delta. \$8.00 per pair \$3.00 extra for trio. Guaranteed Live Delivery, Postpaid, Special Flash, Airmail Service. Send check or money order to:

DELTA AQUARIUM STOCK COMPANY  
Air Force Unit P. O. Box 9507P  
Los Angeles, Calif. 90045  
Phone: (213) 545-6823

## "ATTENTION GUPPY HOBBYISTS"

We are proud to announce that our guppies won fourteen awards at international guppy shows held in Canada, New Jersey and New York.

Available from show winning strains are . . .

Delta-Tails priced at . . .

\$7.00 a pair ————— \$12.00 for two pairs  
\$9.00 a trio ————— \$16.00 for two trios

Colors are Red, Blue-Green Mottl, 1/2-Black Redtail, 1/2-Black Green, 1/2-Black Blue.

Original "KING COBRA" priced at . . .

\$15.00 a pair — \$20.00 a trio

Colors are Red, Blue, Green, Lavender. State second color choice.

NEW "ALBINO KING COBRA" (refer to photographs and article in June 1969 T.F.H. for details of its vivid snake markings throughout its beautiful "fish-colored" body. This new specimen is priced at . . .

\$25.00 a trio (1 male, 2 females).

Guppy Breeders SPECIAL DRY FOOD FORMULA — \$2.50 a pound.

Guppies shipped range 4 to 5 months of age and are guaranteed live delivery to all parts of the world. Postpaid Air-Mail Delivery to anywhere in continental U.S. Make checks payable to . . .

## MAC GUPPY HATCHERY

1043 JACKSON AVENUE, LONG ISLAND CITY, N. Y. 11101 - Tel: ST 4-8108

# INTRODUCING The All PLEXIGLAS SALT WATER AQUARIUM

THE ONLY SAFE WAY TO HOLD SALT WATER FISH!

**50 Stock Sizes  
10 Gallon To 1250 Gallon  
With A 5 Year Guarantee**

SHIPPED TO YOU IN WOODEN CRATES  
GUARANTEED BY US!

**U.S. MADE**

AVAILABLE FOR  
IMMEDIATE DELIVERY

**F.O.B. N.Y.**

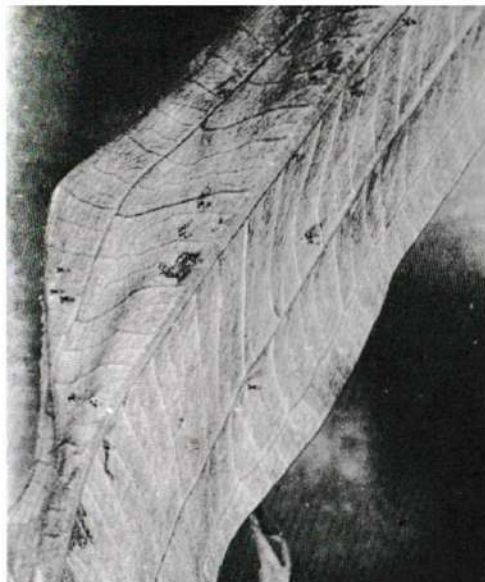
ALSO AVAILABLE: "SUPERSTAND"—made from one inch square steel tubing, in Chrome Finish or Baked Enamel. Models to support 10,000 lbs.  
SHORTLY AVAILABLE: "OZONATORS"—500 & 1,000 gal. per hour outside filters,  
AND MANY NEW PRODUCTS TO COME .....

## JHG ENTERPRISES LTD.

JOBBERS AND DEALERS  
WRITE FOR INFORMATION!

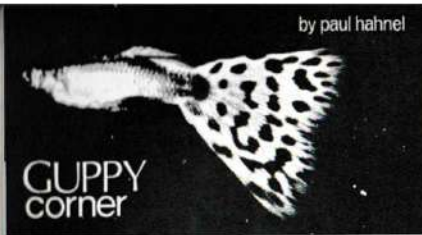
92-31 57th AVENUE  
ELMHURST, N.Y. 11373  
PHONE: 212 271-5676

CABLE ADDRESS:  
AMAZONIA, NEW YORK  
JAGUARIND, NEW YORK



Some of the newly hatched babies adhere to the leaf; youngsters that hatched before those shown in this photograph have already fallen from the leaf to the bottom of the tank.

about 450 eggs were laid. I removed the female, and the male took charge of the eggs. The eggs hatched in 48 hours; at first the fry hung to the leaf, but they later fell to the bottom. After they had fallen to the bottom, I removed the male and started a gentle aeration with small bubbles. The young became free-swimming on the seventh or eighth day. They consumed a great deal of food, and growth is quick. ■



by paul hahnel

**GUPPY  
corner**

### Baby Management

Q. 1. How many male and female guppies can live comfortably in a 10-gallon tank?

2. When is it safe to put baby guppies in the same tank with adult fishes?

3. I have been putting baby guppies in with the grown fishes between the ages of two to five weeks, but about a week after each transfer I find some of the babies have died. I always make sure they are strong and healthy before I put them in with the other fish. Why does such a thing happen?

Theresa Anne Novack,  
Stamford, Connecticut

A. 1. Four males and 10 females would be safe for a 10-gallon tank, but remember that gravel, other solid objects and water level have an effect on tank volume. If you provide correct filtration and aeration and otherwise provide optimum living conditions you can keep a greater number of fish.

2 and 3. Generally speaking, two-week-old baby guppies can be transferred from their birth tank to a tank with adults if the water conditions in both tanks are fairly close. Transferring babies to a tank with very different water conditions can often result in the loss of all or part of the batch of babies. This may, in fact, be the

### DELTA TAIL GUPPIES

Quality fish from trophy-winning stock. Healthy guppies with excellent color from large bodied delta tail strains.

Guaranteed to breed true.

Green Cobra Deltas, \$15 pair \$20 trio  
Blue or Green Deltas, \$10 pair \$14 trio

FISH SHIPPED ARE 3 TO 4 MONTHS OLD

GUARANTEED LIVE DELIVERY

POSTPAID AIR MAIL SPECIAL DELIVERY

Send check or money order to:

GLEN L. PARRISH

10032 McLENNAN AVENUE

GRANADA HILLS, CALIF. 91343

Phone 363-5563

FIRST PRIZE WINNER AT THE INTERNATIONAL 1960 GUPPY SHOW,  
BERLIN, GERMANY

### THE BRONZE DELIGHT

After more than 20 years of breeding exhibition guppies, Mr. Hartung now introduces his greatest achievement — the Bronze Delight with its large Vail-tail breeds true. They are a Red hybrid of golden and gray guppies. You may choose from Green, Leopard, Blue, Variegated or Blue-green tails. \$14 per pair. (\$5.00 extra for Trio).

HARTUNG GUPPY SPECIALIST

Other prize-winning varieties are your choice of Red, Blue, Black, Dark Blue, Variegated — only \$8.50 a pair. Albino Vails, \$8 a pair. Beautiful Green Body and Vails \$9 a pair. GUARANTEED Live Delivery — Postpaid. Send check or money order to WM. HARTUNG, 91.34 - 88th St., Woodhaven 21, N. Y. — VI 7-2528.

April, 1969

reason you are losing some of your babies after they are transferred to another tank.

### Color in Females

Q. I have kept guppies for the past year and a half. My fish have bred regularly all the time I've had them, but I have not culled any of the babies they have produced. Lately I have noticed that some of the females have developed color in their tails. The color is red or yellow-red, and although not intense, the color is immediately noticeable. Some of my females also have black marking in their tails. Can you tell me:

1. Will the color increase in future generations?
2. What breed of guppies are these?
3. What males will be best for increasing color?
4. What books should I get for further information?

Debbie Stuart,  
Zionsville, Pennsylvania

A. 1. There are many females of the type you describe. If you want to increase the color of the fish you breed you must always select breeding individuals that show this trait most strongly.

2. Red-colored tails in females do not indicate any special breed.

### THE EMERALD COBRA

(Deltatail Guppy)

The Ultimate in a Green Cobra Delta Male has green snakeskin pattern on body with wide tails; large, prolific females are light colored with green coat. Guaranteed to breed true. \$14.00 per pair (\$5.00 extra for trio). Also available in blue.

Other varieties include Turquoise Green, Magnificent solid green in body and Delta tails. Blue and Red Deltas, Orange Tail Albinos. \$8.00 per pair (\$3.00 extra for trio). Guaranteed Live Delivery, Postpaid, Special Fish, Airmail Service.

Send check or money order to . . .

DELTA AQUARIUM STOCK COMPANY

Air Force Unit P. O. Box 95079

Los Angeles, Calif. 90045

Phone: (213) 545-6823

## "ATTENTION GUPPY HOBBYISTS"

We are proud to announce that our guppies won fourteen awards at international guppy shows held in Canada, New Jersey and New York.

Available from show winning strains are . . .

Delta-Tails priced at . . .

\$7.00 a pair ————— \$12.00 for two pairs

\$9.00 a trio ————— \$16.00 for two trios

Colors are Red, Blue-Green Multi, 3/4-Black Redtail, 1/2-Black Green, 1/2-Black Blue.

Original "KING COBRA" priced at . . .

\$15.00 a pair — \$20.00 a trio

Colors are Red, Blue, Green, Lavender. State second color choice.

NEW "ALBINO KING COBRA" (Refer to photographs and article in June 1965 T.F.H. for details of its wild snake markings throughout its beautiful "fish-colored" body. This new specimen is priced at . . .

\$25.00 a trio (1 male, 2 females).

Guppy Breeders SPECIAL DRY FOOD FORMULA — \$2.50 a pound.

Guppies shipped range 4 to 5 months of age and are guaranteed live delivery to all parts of the world. Prepaid Air-Mail Special Delivery to anywhere in continental U.S. Make checks payable to . . .

## MAC GUPPY HATCHERY

10-63 JACKSON AVENUE, LONG ISLAND CITY, N. Y. 11101 - Tel: ST 4-8100

**TRUE-BREEDING GUPIES**  
by  
**RON and TINA AHLERS**



From International Prize-Winning Strains  
**SELECTED TRUE BREEDERS**  
Red Tail Snakeskins, A vigorous new hybrid, emerald green body with snakeskin markings and a variegated red delta tail.  
1 pair \$25.00 2 pair \$22.50 2 trios \$40.00  
Red Champions, From our oldest strain, and personal favorite. Fish from this strain have won repeatedly. Large bodied with high delta tails.  
1 pair \$10.00 2 pair \$18.00 1 trio \$25.00  
No odor micro-worm diffuser—add \$1.00 to fish order. Prices include Air-Mail Special Delivery.  
Send check or money order to:  
**MID-ISLE AQUARIUM**  
P. O. Box 206-F2, Deer Park, N. Y. 11729  
Live Delivery Guaranteed

**SHOW STOCK GUPIES**

Large bodies, wide tails of Show Stock Guppies. Choice of King Cobra, blues or multi-color. One pair \$9.99, two pair \$16.99, one trio \$12.00. Each strain will breed true. Price includes packing, shipping. Live deliveries guaranteed. If more than one strain ordered, each strain will be bagged separately. Check or money order must accompany order.

**JOHN DYSON**  
36 Nellie Street  
Providence, R. I. 02850

3. Best breeding stock gives best results. Remember also to provide the best in environmental conditions.

4. TFH Publications offers many fine books on guppies for hobbyists at all stages from beginner to expert. You would do well to visit your pet shop to purchase some of them.

**Water Conditions**

Q. I am at the point of giving up guppy raising because of what seems like unprecedented bad luck. My guppies are suffering from three disorders, and there is nothing I can do with any of them. The symptoms my fishes show are as follows:

1. Bloody spots on the body
2. Females are greatly enlarged
3. Males' finnage shrinks and they "shimmy," usually near the airstone bubbles. The males also have transparent material which does not appear to be feces hanging from the anus.

What do you advise?  
**Phillip Tompkins**  
Moline, Illinois

A. Your water conditions are all wrong, and at this point your fish are beyond help. The only thing to do is for you to start over again. But first I would advise you to do some reading on setting up an aquarium and how to maintain healthy conditions. Proper maintenance and feeding will keep an aquarium in good condition for a long time.

**THE DEGAULLE GUPPY**

(Flag of France)

The most unusual breed of its era. A large, firm hybrid with light face, jet black body, flaming red tail, and white dorsal fin. Female females are olive color with black eyes. They breed true. \$12.50 per pair. (\$4.50 extra for live.)  
Other varieties include Albino Vells, Red Pencil, Las Vegas Green, Lavender. \$7.50 per pair. (\$2.50 extra for live.)  
Guaranteed Live Delivery, Postpaid, Airmail. Send check or money order to . . .  
**MANHATTAN AQUARIUM SERVICE**  
224 - 21st St., Manhattan Beach, Calif. 90266  
Phone: 345-6421

**MAIL CALL**

If you have an aquarium question that you would like answered, send it to MAIL CALL. Each month the most interesting questions received and their answers will be published in this column. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245 Cornelian Avenue, Jersey City, N. J. 07302.

**Swords and Swords**

Q. 1. I have a large broadleaf sword-plant that is very healthy and produces a new leaf almost every week but never sends out any runners. Is it possible to reproduce this plant by means of a splice?

2. I have a four-month-old swordtail that is transparent, with only a faint pinkish color. The littermates all developed the dark red color of the parents. Is there such a thing as an albino swordtail?

**Mr. Antoinette Wright**  
Toronto, Ontario

A. 1. I have never heard of reproducing aquatic plants this way, but that does not mean it can not be done. Try changing the lighting conditions. This sometimes stimulates swordplants to produce runners. Usually more light does the trick.

2. Yes, there are albino swordtails available in a fixed strain. Whether yours is an albino or not is another thing. It must have pink pupils to qualify. It could easily be a gold sword appearing after several generations.

**Sick aquarium**

Q. I have a 35-gallon aquarium in which the fish swim only at the top. In the same aquarium I am having no luck in growing bottom plants. They grow about 4 inches and then stop. I would appreciate your help.

**J. A. Emond**  
Thompsonville, Connecticut

A. Your aquarium is probably low in oxygen and high in carbon dioxide. This may be due to some sort of decay in the sand. Try tearing the tank down and setting it up using a submersible filter. It would be a good idea to probably dose the aquarium with a good quality of light. Try one of the fluorescent bulbs specially designed for growing plants.

**Cloudy water**

Q. I have a 40-gallon community tank which is well lighted. I feed freeze-dried and flake foods, but I have no real plants. My problem is that the water turns cloudy in a few days. My dealer told me to change every object in my tank. I did just that, and the water was

**A New Concept in pH Testing . . .**



**RILA fresh water pH TEST KIT**  
with a LIFETIME GUARANTEE

- GUARANTEED to remain STABLE & ACCURATE INDEFINITELY!
- ACCURATE and EASY-TO-READ Color Chart supplied.
- Tests performed instantly . . . Results always Reliable.
- The FIRST & ONLY pH Test Kit with a written lifetime guarantee. Ask your dealer today . . . or write for complete Product Information.

RILA PRODUCTS • Box 114, Tennek, N. J. 07666

cloudy the next day. Could you please tell me what I am doing wrong?

**Thomas Sciolino**  
Buffalo, New York

A. First you should know that cloudy water is caused by bacteria. The actual cloudiness is caused by uncountable numbers of bacteria floating in the water. Bacteria must have something to feed on. If the nutrient is not present, the bacteria will not grow. Bacteria are capable of living on an incredible number of materials. Biological waste products are obvious substances. Less obvious are materials secreted by plastics and aquarium cement, especially when they are new. Sometimes tap water is loaded with these materials and when the water is warmed, the bacteria "bloom." Usually the best cure is to allow the water to clear of its own accord. Where this is not possible, competition from rapidly growing plants will clear up the water more rapidly. A more drastic cure is to kill the bacteria with a solution of potassium permanganate. This should be administered slowly, or the fish and plants may be killed. Enough of the solution should be added so that the water is a pale purple color. This will disappear in a few hours and more solution should be added. This process is repeated until the water is clear. Sometimes an incredible amount of solution is thus utilized. Milky water is much less likely to develop in an established aquarium than in a newly set up one. Using sand from an established aquarium in a new aquarium will often prevent clouding of the water.

**Ugly Discus**

Q. In one dealer's shop I saw discus which were beautiful in color. They were light brown with blue lines along the edges of their bodies. Another dealer also carries the same type of discus, but his are always gray or dull black. What caused his discus to be so ugly?

**Van Smawley**  
Mooresville, North Carolina

A. Discus that have turned gray or black are getting ready to cash in their chips and



Discus in good shape

should never be purchased. The reasons the discus are in such poor condition are many. Some car-nate importers do not take time to condition their discus before shipping them to dealers. As a result these wholesalers can sell their discus more cheaply. On the other hand, the dealer you speak of could have gotten healthy discus and not have known how to care for them. The water might have been too hard, he might not have been able to get them to eat or the water may have been too cold.

**Yellow sand**

Q. I recently received a 15-gallon aquarium. I have put yellow sand in it. The sand was purchased from a pet shop nearby. It was labeled "Especially for Aquariums." I trusted it would be safe and not harm the fishes. Lately a friend told me the yellow sand would kill the fish, because the pigment would be released and poison the water. Is this true?

**P. T. Thelen**  
Riverside, California

A. No, it is not true if the sand is from a reliable company. Most of these products have been tested thoroughly. No company can stay in business long if its products kill fishes.

**Kissers**

Q. I have never had any luck with kissing gouramis. I have kept two together and three together in a 30-gallon aquarium with other fish. They always fight with each other and one usually chases the other away from food at feeding time. Even the books I read do not agree with each other. One book says this is a good fish for the community tank and another says it is not. What do you say?

**John Kern, Jr.**  
Glendale, New York

A. What does one fish of a species picking on another fish of the same species have to do with the community tank? Kissers

are good fish for the community tank. They seldom bother other fishes, although there are exceptions to this. They are difficult to keep together for the reasons you state. It is better to have several than just a pair. This allows the dominant fish to spread his aggressions over a number of victims rather than making life unbearable for just one.

**Pseudotropheus auratus**

Q. My Pseudotropheus auratus spawned yesterday in soft water. Is this unusual? Was I correct in removing the female and isolating her in a 10-gallon aquarium because the male was still bothering her?

**Bill Craig**  
Costa Mesa, California

A. Although Pseudotropheus auratus comes from a lake with alkaline, relatively hard water, it has shown itself to be very adaptable. It has been recorded as spawn-

Please Mention T. F. H. When Writing to Advertisers

**Worldwide Exotic Fins**

BREEDERS ANGELS MATED PAIRS	
Black	\$45.00
Black Veils	55.00
Blushing	45.00
Blushing Veils	55.00
Black Lace	40.00
Black Lace Veil	50.00
Silver	35.00
Silver Veils	45.00

**GUPIES**  
Large Broadtail—True Breeder, Greens, Reds, Blues, Tuxedos & King Cobras, per trio—\$15.00. Fish unlisted can be furnished on special order. Price will be quoted on request. On special orders give both common and scientific name of fish. Guaranteed live delivery.

**HOBBYISTS**  
Buy direct from breeder and importer. We have been breeding and importing show fish for over twenty years. WE KNOW OUR FISH! AND ONLY HANDLE THE FINEST. All shipments made by air, parcel post, or express. Customer will be notified in advance, date of shipment, and approximate arrival time.

**SHOW FISH**  
Large show bettas 3" and up, assorted colors, 4 for \$25.00; Large show guppies, 6 to 8 months old, assorted colors, 4 for \$25.00; Discus, Blue Heckel, 4" bodies and up, 2 for \$50.00; Discus, 4" bodies and up, 2 for \$35.00; Flaming Fire Eel, 9 to 12", each \$25.00; Arowana, 9 to 12", each \$25.00; Black Ghost Knife, 9 to 12", each \$20.00; Albino Clarias, Walking Cat, 9 to 12", each \$20.00; Piranha, 6" and up, each \$20.00; Minimum sale \$15.00.

MAIL YOUR ORDER TODAY, CHECK OR MONEY ORDER NO C.O.D.  
**WORLD WIDE EXOTIC FINNS - P. O. BOX 407 - BRADENTON, FLORIDA 33505**



*Pseudotropheus auratus*

ing in water of a wide range of chemical compositions. Your action with the female seems correct, especially if it promoted a successful hatch.

Please mention T.F.H. when writing to advertisers

**MASTER BREEDER CULTURES** by DALECO

ENJOY CONTINUOUS LIVE FOOD SUPPLY CLEAN, DEPENDABLE, FOOL PROOF

Mail Coupon Today! DALECO, 416 Glenalby, Tonawanda, N. Y. 14150. I enclose \$ . Rush postpaid on Money-Back-Guarantee.

- Culture Method (specify) \$ .25
- DROSOPHILA\* (wingless Fruit Flies) 1.50
- DROSOPHILA MASTER BREEDER Culture plus 1 yr. AGAR supply 3.00
- MICROWORMS\* 1.00
- MICRO MASTER BREEDER pkg. (Culture, breeder jar and Media) 3.00
- EUGLENA\* (green infusorid) 1.50
- TENEbrio\* (Meal Worms) 1.75
- GAMMARUS\* (1/4" crustacean) 1.75
- OLIGOCHAETES\* (1/4" aquatic worms) 2.00
- DAPHNIA MAGNA 2.00
- STERILIZER (10-oz. concentrate) 1.00
- SR. WATER POLYSHER FILTER prevents fungus on fertile eggs
- WORLD'S FINEST AIR PUMP for aquarists who refuse to compromise; 1/2 hp. 1.30 aquarium-size—

\*Shorter TOTAL SILIENCE 33.95 Cultures

Name \_\_\_\_\_ Address \_\_\_\_\_

**Albino Swordtails**

**Q.** I have a number of tanks in which I raise albino swordtails to sell. I have read many well-known books as well as past issues of *TFH*. I have not come across any information on these swordtails. I have found these fish to be healthy as well as very beautiful. Why is there such a lack of information about them?

**Mark Schultz**  
Springfield, Massachusetts

**A.** Every article you have seen about any color of swordtails will give the same information that an article devoted exclusively to albinos would. After you have pointed out that albinos may be somewhat more sensitive than most colors and after you have described what albino swordtails look like, you have exhausted the uniqueness of the fish.

**Plastic containers**

**Q.** Could you tell me if there are certain kinds of plastic containers that are harmful to tropical fishes? Can you use plastic containers to store water for several days to season the water for use in an aquarium?

**R. Althoff**  
Livonia, Michigan

**A.** I have never encountered a plastic container which was poisonous to fishes, although there might be some. Some plastics, however, have the capacity to act like a sponge and absorb some of anything which is placed in them. This can later appear in other materials placed in the container. For this reason it is important that containers used for fish water not be used for soap or other cleaning solutions.

**Raising brine shrimp**

**Q.** I am interested in raising my own adult brine shrimp. I have heard that special salts are necessary in order for brine shrimp to be raised to maturity. What kind of salts do I need?

**Paul Jensen**  
Long Beach, California

**A.** You do not need special salts. I recommend the use of one of the many synthetic salts used with marine fishes. Adult shrimp require a higher concentration than is needed for hatching. I would suggest starting the shrimp out with a hydrometer reading of 1.025 and over a period of two to three weeks increasing the reading to about 1.045. Evaporation may take care of this for you. The shrimp must be furiously aerated and fed small amounts of dried cake yeast. They reach maturity in about four weeks.

**Oscars**

**Q.** I have recently purchased a baby oscar approximately one inch long. He is both friendly and inquisitive. Since I know nothing about oscars and their requirements, will you be kind enough to answer the following questions:

1. How long may he be kept in a ten-gallon community tank?
2. What size tank will be needed for his permanent home?



Mature oscar

3. Since oscars are both friendly and inquisitive, have they ever been coaxed or trained into becoming real "pets"?

**Jean Furlong**  
Baltimore, Maryland

- A. 1. Until such time as he starts chasing or eating the other fishes.
2. If it is to have a tank of its own, 15 gallons is a minimum.



Baby oscar

3. I once saw an oscar in Los Angeles which was trained to jump out of the water for a slice of frozen liver and which seemed to enjoy being "petted" by its owner.

**Squiggly worms**

**Q.** Shortly after buying some new plants for my 10-gallon aquarium, I noticed the water was filled with hundreds of tiny white worms. I asked my dealer about them and he said that this con-

**UNWELCOME BOARDERS?**

**use SNAIL-RID**

- SNAIL-RID . . . internationally accepted by universities, fish farms, and hobbyists all over the world as the POSITIVE method for snail control.
- SNAIL-RID . . . is quick and easy to use—one drop will kill BOTH the snail-eggs and adults, within hours without harming the fish.
- SNAIL-RID . . . is inexpensive—15-oz. bottle will treat over 400 gals. of water at less than 1/4¢ per gallon.

Approved & Registered USDA  
If unable to obtain from your local dealer, send \$1.00 to  
**ARKANSI RESEARCH, 375 S. Houton**  
Westland, Michigan 48185

dition probably developed from over-feeding and not from the plants. He also said they would not harm the fishes and that the only way that he knew of to get rid of them was to stop feeding for about two weeks. I have tried this with no success. What can be done about these worms?

**William Hoonits**  
Springfield, Massachusetts

**A.** These small worms usually develop in fry tanks where heavy feeding is taking place. Weekly siphoning the bottom and changing about a quarter of the water should help bring them under control. They are not harmful to the fishes. Some aquarists have reported that methylene blue will eradicate them.

**Red Devils**

**Q.** I live about 100 miles north of Philadelphia. I have two young red devils. The male is about three inches long and the female is about two inches long. I have a pond in my yard which holds about 200 gallons of water. Would I be able to keep these two fish in the pond this summer?

**James Wills**  
Wilkes-Barre, Pennsylvania

**A.** There is no reason why you should not be able to keep these fish in the pond as long as the water temperature does not fall below about 70 degrees. A glass or clear

plastic cover for the pond, since it is small, will help the water warm faster and cool more slowly. A summer in the pool with plenty of food should bring them to breeding size.

**Disappearing Nests**

**Q.** I have a pair of opaline gouramis that are about four inches long. The male built a bubble nest when I raised the temperature from 70 to 80 degrees. When I put the female in with the male, he built a bigger nest. The next morning the nest was gone. This was in a 21-gallon aquarium. What happened to the nest?

**Paul Havran**  
Astoria, New York

**A.** The nest probably simply fell apart. This is more likely to happen rapidly when the atmosphere is dry and/or cold. Covering the aquarium will help prevent this. The aquarium is extremely small for breeding this fish. A ten-gallon tank is a minimum both because of the size of the fish and the number of young produced.

**Plant problems**

**Q.** Several weeks ago I set up a 20-gallon aquarium with an undergravel filter. I am having several problems and would appreciate some help.

1. Brown and green algae has appeared on the plants and glass. I have tried a commercial algicide, but it had

no effect on the brown algae. A friend said that tiger barbs would help, but in my tank I have small fish which the barbs attacked when they were placed in the aquarium. I was forced to remove them. What can I do about this algae?

2. My temple plant keeps producing other temple plants by budding. Every time one of these plants appears the main plant loses a few leaves. Why does this happen?

3. In the tank I also have several *Sagittaria natans* which produce albino leaves. This apparently does not affect the plant adversely. What happened?

**Andrew Sivak**  
Alliquippa, Pennsylvania

**A.** The answer to all your questions is the same: there is something wrong with the lighting conditions in this aquarium. The algae, loss of leaves and chlorotic leaves all suggest too much light or light of the wrong quality. I would suggest that you use one of the specially designed fluorescent bulbs intended for use in growing aquarium plants. Nearly all dealers carry them.

Please mention T.F.H. when writing to advertisers

**DON'T ASPHYXIAE YOUR FISH!**

**AQUA CARBON**  
Eliminates Dangerous Aquarium Gases.

Specifically developed to prevent the gases in your aquarium from reaching the danger level.

**Features:** • Instantly adsorbs all harmful gas-gases (CO<sub>2</sub>, ammonia, nitrites, nitrate, chlorine) from either fresh or salt water. • Small, uniform grains of carbon efficiently trap organic waste. • Max. a large surface area to which beneficial bacteria may cling to create a biological filter. • Unsurpassed water clarity. Double-packed in Nylon Filter Bag within poly bag.

1/2 lb. \$1.19  
1 lb. \$1.89

SHIPPED BY AIR MAIL

**AQUARIUM STOCK COMPANY, INC.**  
31 WARREN ST., NEW YORK, N.Y. 10007  
9070 BEVERLY BLVD., LOS ANGELES, CALIF.

**FISH FARMERS, WHOLESALERS and FOOD DEALERS . . .**

☆☆☆

Get a FREE listing in our annual Pet Directory. Form sent free on request. Over 250 pages. Our monthly trade magazine goes to pet shops only. Established 1946. Subscription rates upon proof of doing business at the retail or wholesale pet or pet supply level.

**PET SHOP MANAGEMENT, INC.**  
P. O. Box 109, Fend du Lac, Wis. 54935

**Attention:**

**AQUARIUM & PET SHOPS EVERGLADES**

has been in business

**38**

**YEARS**

and wants to serve you!

Bonafide DEALERS please write for our wholesale list using your letterhead. Your name will be placed on our Mailing List.

**NO RETAIL**

**EVERGLADES AQUATIC NURS., Inc.**  
P. O. Box 587  
Tampa, Fla. 33601

**OLDEST AQUARIUM MAGAZINE**

**Yearly \$2.00**

**Two Years \$3.00**

SIX ISSUES COPY 35c

With Reptile Section - Illustrated Edited and Published by

**AUGUST M. ROTH**

50 Yrs. Publishing Aquatic Life Information  
6189 KENWOOD AVE.  
BALTIMORE - MARYLAND, 21237

**live cultures** (with instructions)

- Micro Worms \$1.00
- White Worms 1.50
- Meal Worms 1.50
- Drosophila (wingless!) 1.75
- Food for Cultures \$1.00 ea.

(Mailed U.S.A. only)

**Authentic Distributors, Inc.**  
Box 414H St. James, N. Y. 11780

**ONLY the world's finest filter has ANY of these features --**



NEW FILTERING DELUXE 30A WITH NEW HIGH-SPEED SUPER-FLO AIR LIFT AND SELF-ADJUSTING SIPHON.

Here's precision-tested proof of the enormous 300% difference they make in the only test that counts—actual weight of waste removal.



FILTERING over 300% more waste removal than leading Bubble-type outside filter... or a leading motor driven outside filter costing nearly twice as much!

Only Scattergood filters are designed for amazing Scazo Activated Carbon that removes dissolved waste products (dissolved fish waste, etc.) as well as suspended dirt — lasts a year and costs very frequent changes of old-style bone charcoal and glass wool. Permanent crystal-clear water and healthier fish — never change your water again.

From Scattergood... America's Master Craftsmen of Fine Filters!

See SCATTERGOOD products at the QUALITY dealers in your area and get the details on the tests that prove the amazing performance of the new FILTERING. Buy No Filter until you see it! If there is no dealer in your area, write for catalog and free new booklet "Getting the Most Out of Your Aquarium Filter." Print and include ZIP.

**Scattergood Filters Co.**  
ESTABLISHED 1947 — MILLER 77, MISSOURI

**Rivulus ocellatus**  
Q. I have a pair of *Rivulus ocellatus* which have laid many eggs.

- To hatch the eggs, what kind of water should be used?
- Can the eggs be lifted with the fingers or should a bit of plant be lifted with them?
- What should the hatching conditions be like?

Alain Maranda  
Montreal, Canada



Rivulus ocellatus

A. 1. Try the water you spawned the adults in. If the eggs do not hatch within about 10-15 days, try diluting your tank water with half distilled water.

- It is better not to touch the eggs.
- The eggs can be hatched in a pint container as long as they can be kept at about 75 degrees. Light should be avoided and a few drops of methylene blue added to prevent spoiling of the eggs.

**Discus Blues**  
Q. The more I read about the beautiful discus, the more I become confused about them. The many articles written about the care and breeding of the discus always seem to leave out one very important item: how to sex them. One article side-stepped the issue by suggesting that several discus be kept together

from a young age and be allowed to pair off themselves. This is a very expensive suggestion. Is there any way discus can be sexed?

Dennis Walrod  
Jamestown, New York

A. *Discus* are very difficult to sex even when in breeding condition. Young discus are even more difficult to sex than young angelfish. Mature males tend to be more colorful (have more blue or green) than females and females tend to be a bit thicker when viewed from above.

**Killie Fry**

Q. I have been successful in spawning several panachas. My problem is in raising the fry. When they hatch, I put ten or twelve in a 10-gallon tank. After a week they have all disappeared. I feed them a liquid fry food. What am I doing wrong?

Tom Cloch  
Dearborn Heights, Michigan

**PET TOWNE**  
QUALITY TROPICALS IN 5 LOCATIONS

**Massachusetts:**

- 776 State St. (RT. 20) SPRINGFIELD
- 1655 Boston Rd. "Eastfield Mall" SPRINGFIELD

**Connecticut:**

- 671 Silas Deane Hwy. (RT. 9) WETHERSFIELD
- 544 K Windsor Shopping Plaza — in the mall. (RT. 5A) WINDSOR
- (RT. 69) Waterbury Ave. PROSPECT

Come See Us — Soon and Often

**Tropical Fish Hobbyist**

A. You are doing two things wrong. First, you are feeding them the improper food. Heavy hillie species of my experience is ready for newly hatched brine shrimp just after hatching. They merely starve to death on your infusoria-substrate food. Secondly, the aquarium is much too large for keeping an eye on the fry and being sure they are eating enough. Try a 2- or 3-gallon tank for a dozen fry.

**Pelmatochromis guentheri**  
Q. About eight months ago I bought two unnamed dwarf cichlids. To my surprise I found that I have two *Pelmatochromis guentheri*. I have found very little about this fish. What can you tell me about it?  
Tom Mooney  
Salisbury, Maryland

A. There are many kinds of *Pelmatochromis* being imported of late, most of them given erroneous names. In the last few months I have had three distinct kinds



*Pelmatochromis guentheri*

of fish shipped to me as *Pelmatochromis* sunnecteds. One of these was *P. guentheri*. This is the only member of the genus thus far reported to be a mouth breeder. The female of this species tends to be larger, more colorful and more aggressive. She also initiates courtship. The eggs are laid on a stone or slate bottom and then picked up by the female. Water conditions should be relatively soft and slightly acidic.

**Water worrying**  
Q. I have had an aquarium for over a year. Until a couple of months ago I had never worried about pH. I have been successful since I started. How can this be?  
Gary J. Wood  
San Diego, California

A. You were probably successful because you were not filling your aquarium with a lot of worthless or harmful chemicals. pH is much over-rated as a factor affecting fishes. Beginners should not worry about it.

**Snail cure**  
Q. Aquarists bothered by snails taking over their aquariums might be interested in this solution which I came upon quite by accident. We have a tank of guppies from which we had been siphoning about 50 round brown snails every three or four days. The snails probably came in as eggs from a nearby pond where we get live food. They multiplied until they were unsightly, and a pollution problem when they died. In another tank we had angels and *Metynnis*. The

**AQUARIUM PLANTS THRIVE**

and so do fish... Plantabbs Aquarium Plant Food Tablets feed your aquarium plants to thriving, full-bloomed beauty. Healthful to fish, too. Economical and convenient. Just put in 1 tablet per each 5 gallons of water. Use once every 10 days. Guaranteed Safe!

**PLANTABBS**  
AQUARIUM PLANT FOODS  
Plantabbs, Timonium, Maryland

**WE WILL PAY YOU 25¢ TO TRY OUR NEW PRODUCT**



**AQUA-BIOTICS ALGAE DESTROYER**

18 tablets treats 90 gallons for only 99¢

99¢

Simply send us the name **ALGAE DESTROYER** from a package... available at better pet shops and aquarium stores everywhere.

18 tablets treats 90 gallons for only 99¢

Mr. Dealer: Send business card or letterhead for a free sample package of the most powerful and economical product for the control of algae in the aquarium.

**DEPENDABLE and SURE... PREVENTION and CURE**

**AQUA-BIOTICS™**  
AQUARIUM PHARMACEUTICALS, INC.  
BOX 958 (DEPT. FX), ORESHER, PA. 19029



*Metynnis* were chewing up the plants so badly that I moved them to the guppy-tank to give the plants a chance to grow. One day later snails were gone from the guppy tank and the *Metynnis* were fat and sassy. I have never heard of *Metynnis* eating snails before, but they certainly do the job.

Mrs. L. E. Prestwood  
Milpitas, California



Tetraodon somphongsi

A. Ridding the aquarium of snails is the topic of many letters to this column. Using *Metynnis* is a new one on me, but if it works as well as you describe, it might be worth a try. Don't expect much for your plants though! Another fish which eats snails is *Tetraodon somphongsi*. The problem with this fish is that it is a fin nipper.

Red Albinos

Q. My green swordtail recently had a brood which contained fry which were green, red, five albinos and one red with pink eyes. Is the red-eyed red swordtail rare?

Joyce Shelton  
Whittier, California

A. It is unusual to find a female carrying so many recessive mutations. She was from very mixed parentage. The red with pink eyes is simply an albino with red pigment. The strain is not too frequently seen today, although some years ago it was quite popular.

Gold Congo Cichlids

Q. I acquired a pair of beautiful cichlids sold under the name of gold Congo cichlids. They are now of a fairly large size; the male is about three inches long and is a lustrous white with blue fin highlights. The female is about an inch smaller and has a pink stomach. They spawn very easily with no coaxing. They are not overly aggressive, are good parents and have raised a family in a community tank.

1. What is their scientific name?
2. Please give me some information on this fish. I have looked in all my books and cannot find anything like them.

Terrence Cabanagh  
Wesleyville, Pennsylvania

**THE ICHTHYOPHILE** A NEW  
TROPICAL FISH PUBLICATION  
*Your dealer's gift to you for being a good HOBBYIST*  
Dealers WRITE FOR SAMPLES AND PRICES  
THE ICHTHYOPHILE RT. 4 BOX 925 MIAMI, FLA. 33156

A. 1. The scientific name is *Cichlasoma facutum*. Your fish are a mutation of the normally colored variety.

2. The variety was originated and fixed by Gulf Fish Farms. Although the fish is extremely pale, it is not an albino, because it lacks pink eyes. The white form is much more peaceful than the wild form, commonly called the Congo cichlid. The latter name is a misnomer, since the fish was originally found in southern Brazil, not Africa.

Lonely Tetra

Q. I have a large black tetra that is always picking on my angelfish and cardinal tetras. Is there any way I can stop this?

Jan Musial  
Ukiah, California

A. The most practical solution is to get rid of the black tetra. It might also work to buy two or three more black tetras to give him some of his own kind to pick on.

Tonic

Q. Is sodium bicarbonate a good general tonic for a community tank?

Lynn Anthony  
Jacksonville, Florida

A. It might stimulate the skin of the fishes to secrete more mucus onto the surface, making it more difficult for diseases to get started. It also makes the water hard, which is not desirable for most species. You should find ways of keeping your fishes healthy without the use of tonics.

*Teo Way Yong & Sons, Ltd.*  
Importers & Exporters of  
Fancy Tropical Fishes,  
Wild Birds & Animals  
Shipments to Any Part of the  
World  
28, Yio Chu Kang Road  
Singapore 19  
Cable Address:  
"CATFISH" SINGAPORE

**MUST WE STAND ON OUR HEADS TO GET YOU TO GROW LIVE FISHFOOD!**

**GROW YOUR OWN FISHFOOD!**

IT'S CHEAPER ON THE LONG RUN. FACT RETURN-MAIL SERVICE. We get your order in the morning and ship it to you in the afternoon. Orders ship and you find that our service is always available.

1. **BLACK WINGLESS FRUITFLIES** (\$2.00). Best & cheapest species to grow. One gallon, 1000. (Shipped alive every day.) (See our website for details on how to grow them.)
2. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
3. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
4. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
5. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
6. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
7. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
8. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
9. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
10. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
11. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
12. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
13. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
14. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
15. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
16. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
17. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
18. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
19. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)
20. **BRUSHY NECKED GUPPIES** (\$2.00). (Shipped alive every day.) (See our website for details on how to grow them.)

**REMEMBER**  
YOUR FISH NEED LIFETIME CARE AND  
GROWING YOUR OWN FISHFOOD IS THE  
BEST WAY TO GROW YOUR OWN FISH.

To the total cost of your order, add 20% for handling and insurance charges. If needed, add extra 5% for air mail and/or for special delivery to your area.

**AQUA ENGINEERS**  
BOX 1, ORTONVILLE, MICH. 48462 U.S.A.

*Geophagus brasiliensis*

Q. I would like to know the earliest age at which *Geophagus brasiliensis* is able to spawn. I have two three-inch specimens. The day I bought them they began to lock jaws and the fish that



*Geophagus brasiliensis*

broke away was driven unmercifully. They are now peering at each other through a tank divider. Can these actions possibly indicate a desire to spawn? When they are fully grown, can these fish be trusted with mature key-hole cichlids and angelfish?

Mike Foran  
Phoenix, New York

Read it next month in  
**TROPICAL FISH HOBBYIST**...

**Lawrence the Whelk**

BY DORIS WHITNEY

A. Three inches is just about the minimum breeding size for this species, but jaw locking does not necessarily indicate that you have a pair. Sexing is difficult, but males tend to be more colorful. The only way to find out what they have in mind is to remove the partition! They should be acceptable tank companions for the fish you mention.

Please Mention T. F. H. When Writing to Advertisers

**FOR SALE**  
**The FISH BOWL**  
Irvington, N. J.  
One of the country's best-known and most popular tropical fish stores. Highest reputation.  
Reply to:  
1064 Springfield Ave.  
Irvington, N. J. 07111

**Thai Tropical Fish Limited Partnership**  
EXPORTERS of all kinds of TROPICAL FISH and PLANTS  
INQUIRIES INVITED  
No. 1595/3 Kasemsuan Lane, Charoen Nakorn Rd., DHONBURI, Thailand  
Tel. 63392 & 63979  
Cable Address: JUKIANGGOH

**salts FROM THE seven seas**

BY ALFRED A. SCHULTZ



Q. When I feed my fish, some of the food falls to the bottom of my tank. Should I remove this food immediately, or is it all right to wait an hour or so?

Harriet McCarty,  
Lima, Ohio

A. Food can be left in the tank for about an hour after feeding. Should your fishes refuse to eat after that time, siphon out the uneaten food. Perhaps you feed your fish too much at one time. The best rule to follow is to feed as much food as your fish will eat in five minutes.

Q. There is a brown slime that forms on the glass and the coral in my aquarium. How can I remove this slime?

Milton Jonas,  
Washington, New York

A. The brown slime you talk about is quite common in a marine aquarium; it comes from waste products in the water. To clean the glass in your tank, use a scraper. The coral is something else again. To clean, it must be removed from the tank and put under a strong jet stream of water.



**WHY RILA MARINE MIX?**

Simply because you'll be getting the finest synthetic sea salt available — proven by years of consistent, dependable performance.

A quality product guaranteeing the highest degree of uniformity and purity.

Contains the 19 major trace elements of natural sea water. Provides the ideal media for all marine life.

Ask your dealer today or write for complete Product Information Bulletin and free Salt Water Bulletin.

**RILA PRODUCTS • Box 114, Teaneck, N. J. 07666**



Big mouth plus big appetite adds up to big trouble for the hobbyist not forewarned of the tankmate-swallowing tendencies of *Leiocassis siamensis*

My

◆ BULGING ◆

*Leiocassis siamensis*: a tongue twister? You bet! If you're not too good at scientific names (like me), you'll probably recognize this fellow under one of its common names, and this guy's got a lot of 'em! You can take your pick of bee- (or B-) cat, bumble bee catfish, chocolate-cream cat, or Siamese catfish. Where I come from, we've got another name for him—killer cat.

*Leiocassis siamensis* is a member of the family Bagridae, a family of naked catfishes found in Africa and Asia. Our bumble bee cat comes from Thailand. He is related to *Parauchenoglanis macrostoma*, from Africa, and *Myxus vittatus* and *tengara*, also from Africa. Still don't know what I'm talking about? Well, then I suggest you go look him up in one of your reference books. (Every hobbyist has a fish library, doesn't he? Every fish fanatic I know does.)

Unfortunately, to my knowledge, our Asiatic bagrid has not been bred in aquaria and must be imported from its native waters. The bumble bee cat is in appearance one of the nicest-looking catfishes you can get. It has a rather long (yet stocky) body, of a chocolate-brown color, alternating with bands of cream. The fins are relatively clear, with a yellowish cast. The adipose fin is one of the largest seen on most commonly kept catfishes, and is chocolate with a cream border. The fish has six short barbels and small black beady eyes. It has a large, underslung, sharklike mouth, so, prospective buyers, BEWARE!!

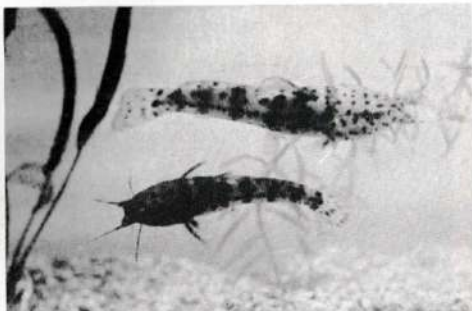
Bagrid

BY ROBERT KREBA



Nocturnal and secretive, *Leiocassis siamensis* is an interesting but demanding aquarium fish.

This is definitely NOT a fish for the community tank! It can be kept there only when very young. And it grows fast. I have a three-inch specimen which grew to five inches in one month! Its progress will probably be better believed when one realizes that it ate numerous guppies, sticklebacks and minnows during this time. To show you how completely unpredictable they can be, however, I know a dealer who kept one that was at least eight inches long in a 29-gallon tank with swords, guppies, barbs, angels, gouramies and a few tetras, without any noticeable damage. Of course, the majority are killers, so it is best to keep them with large fishes in a large tank. I keep mine with some firemouths and some small South American catfishes in a 15-gallon tank. And even then I feel that I'm living dangerously!



*Parauchenoglanis macrostoma* is another bagrid catfish with a hearty and non-discriminating appetite. Young specimens are shown here. Photo by Dr. Herbert R. Axelrod.

*Leiocassis siamensis* is nocturnal, so you probably won't see your bee-cat too often. Mine comes rushing out every time that I feed my fish either pellet, tablet or freeze-dried food. At such times, it chases all my others away and usually drags the food to its cave for itself. I can then feed my other fishes. The bumble bee cat is a heavy eater and accepts most foods. An occasional guppy or minnow is greatly relished and helps to curb the fish's aggressive tendencies. Don't worry if he doesn't come after it right away. It'll be gone in the morning! Also, it is necessary to have a large cave for your bee-cat.

What then, is the use of keeping the species? Well, for anyone desiring an off-beat, or personality fish, this is it. When you do see your catfish from Siam, it will be well worth waiting for. Its color, combined with its amusing method of propulsion, make an interesting and amusing picture. And, believe me, they have more than their fair share of personality. At my place, we have a nickname for our "bee"—Beezlebub! For the catfish connoisseur, *Leiocassis siamensis* is a must.

So, amid the barrages of insults that I hear about the ugliness of my bashful but greedy Oriental oddball, I stand behind *Leiocassis* and defend it to the death. Go out and get yourself a bumble bee catfish; forewarned of what you have to be careful about in its tank accommodations, you won't regret it.

Had enough of fish stories?



**TRONIC** products really do what they say they do! . . .

and at prices which every hobbyist can afford.

2 - NEW PURIFYING MEDIUMS . . . One for FRESH and one for MARINE

Finally, a unique and scientific approach which solves every conceivable chemical water problem — hardness, pH, toxic ions etc.



Remarkable New FILTER MATERIAL

A major breakthrough in filter mats . . . generous supply, does not rot, practically indestructible . . . can be cut with scissors to fit your filter.

Long Lasting ACTIVATED HEAVY CARBON

For all aquariums . . . Supplants charcoal. Fine particle size and tremendous activity assures crystal clear water. Replace only once a year!



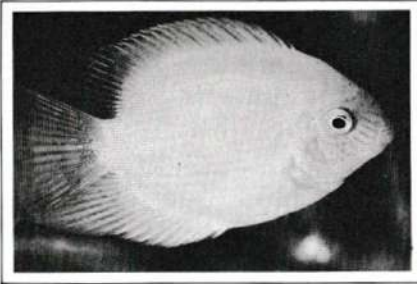
DEALER INQUIRIES INVITED

**TRONIC** products

TROPICAL FISH PATTERNS, INC. SUITE 302, 921 BERGEN AVENUE, JERSEY CITY, N. J. 07306

Contest Winners

Everything runs in cycles. In the beginning of the photo contest we were receiving many photographs of marine tanks and individual salt-water species . . . for a month or two, in fact, we received more entries portraying salt-water subjects than fresh-water subjects. Now, however, marine submissions are running more in alignment with the actual ratio of marine aquaria to freshwater aquaria within the hobby. Winners in this month's contest appear below.



Closeup by Kenneth A. Tierfelder, Rochelle Park, New Jersey.



Landscape by Robert Shaffer, South Bend, Indiana.

Your name should be on the cover of this magazine

tropical fish hobbyist



If it isn't, mail the coupon

Subscribers receive every issue of TROPICAL FISH HOBBYIST without fail.

Subscribers are kept informed about every important development in the aquarium hobby . . . the new fish, the new people, the new products, the new techniques . . . every month.

They also know that they'll always be up to date with their free supplements to EXOTIC TROPICAL FISHES.

Subscribe NOW to TROPICAL FISH HOBBYIST, the biggest (more pages, more pictures, more information, more readers), most colorful (a minimum of 24 color pages in each issue), most interesting aquarium magazine in the world.

TROPICAL FISH HOBBYIST  
245 Cornellison Avenue, Jersey City, N. J. 07302

Enclosed please find check, money order or cash for:

- Sample copy - \$ .50
- 12 issues of Tropical Fish Hobbyist, \$ 4.00
- 24 issues of Tropical Fish Hobbyist, \$7.00
- 60 issues of Tropical Fish Hobbyist, \$15.00

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

Foreign Subscribers: State \_\_\_\_\_ Zip \_\_\_\_\_

Add 60¢ per year's subscription.