

Tropical Fish Hobbyist

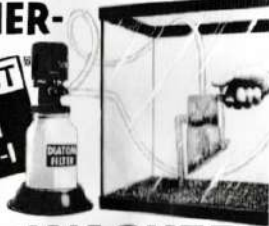
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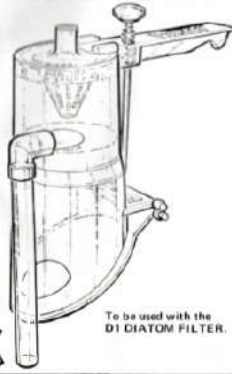
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Tropical Fish Hobbyist

VOL. XXV, April, 1977 (#254, No. 8)



Cover:
A male dwarf
gourami,
Colisa lalia,
adds some
bubbles to his
bubble nest.
Photo by
H.J. Richter.

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Rates

\$7.50 per copy in the U.S., \$7.50 per copy in Canada or foreign, \$7.50 for 12 issue subscription in U.S. Add \$1.20 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 Nulley Lane, Hengate, Surrey, England. In Australia and the South Pacific by Per Imports Pty. Ltd., P.O. Box 149, Brookvale 2103, N.S.W., Australia. All subscriptions and inquiries should be sent directly to them.

Second class postage paid at Neptune, New Jersey. Published monthly by T.F.H. Publications, Inc., 21 West Wykonia Ave., Neptune City, New Jersey 07753.

Exotic Tropical Fishes Supplements
Pages 17 & 18, 83 & 84. These pages are perforated and punched for easy removal and insertion into the looseleaf edition of *Exotic Tropical Fishes*, available in pet shops everywhere.

Cichlid Comparisons



The pink convict cichlid,
Cichlasoma nigrofasciatum, guards
the entrance to its rocky domain.
Photo by A. Kochetov

Cichlids

the Africans vs the Central and South Americans



Labretropheus travassoi is one of the most colorful and readily available African cichlids. Photo courtesy of Wardley Products Co.

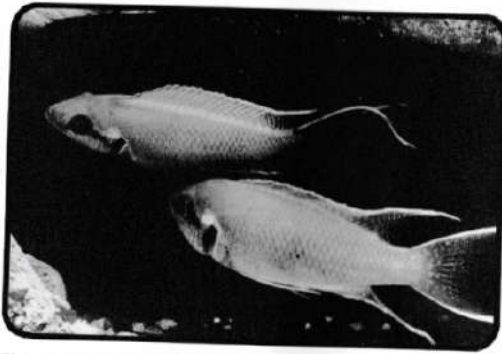
by Donald J. Scheer

For cichlid enthusiasts, the African Rift Lake specimens are beyond a doubt among the most coveted of all cichlids. Many serious hobbyists who always had at least a few tanks of Central and South American cichlids have been so smitten by the cichlids of Lakes Tanganyika and Malawi that they have converted their tanks completely over to the Africans, and for good reason.

The African fishes are lively and colorful; when bred, their offspring generally yield excellent prices. For the first time, many hobbyists who do some breeding for sale to shops have earned enough money to partially or

fully defray the cost of their hobby. Some who have bred the "hot items" have reaped substantial profits. A few good spawns of *Cyphotilapia frontosa*, *Haplochromis moorii*, *Tropheus duboisi* and the like may quickly bring in several hundred to a few thousand dollars.

In fact, the high prices of some of these cichlids, rather than being a deterrent to sales, have added substantially to the African mystique. After all, a \$300 breeding trio of fish is an aquatic status symbol worthy of cocktail party banter, even among people who do not share the excitement of the hobbyist. Driving a Mercedes, drinking



Chivas Regal and owning a \$200 pair of fish is impressive stuff in some circles. "Oh yes, see that big black and white striped fish. It's called a *frontoso*." Some poor native had to dive 50 feet deep into Lake Tanganyika to get that baby. Set me back \$100 bucks! Like another hors d'oeuvre?"

So African cichlids are beautiful, active fishes which can earn money and even status for their owners. Like many other cichlid fanciers, I too have been swept away by the African tide. More than half of my 50-plus tanks have been set aside for the Africans. I appreciate their colors, interesting shapes, incredible energy and the money I have earned from the sales of their fry. Why then after three years of owning and breeding Africans do I find myself spending more and more time in that section of my basement which is devoted to my breeding pairs of red devils, cacars, uarus, Texas, Dempseys, severums, managuense and yes, my plain old convict cichlids?

Lately I asked myself the question "If I were going off to that proverbial

Lamprologus brichardi is a Tanganyikan cichlid that conceals its eggs and fry in caves. Eggs can be seen on the roof of this cave. Photo by H. J. Richter.

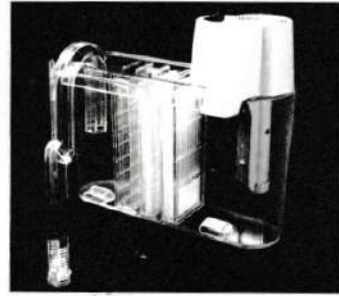
desert island and could take along only one pair of cichlids, which pair would it be?" While the answer changes from day to day, I can say with some assurance that the pair would not be African. I would not take my *frontosas* and run, and there isn't a *Haplochromis*, *Lamprologus*, *Tropheus*, *Julidochromis*, *Pseudotropheus*, *Melanochromis*—whatever that would get the nod. No sir, I would make my choice of cichlids from south of the border.

Why? Is it simply a case of not ever forgetting one's first love? That's undoubtedly a part of it, for I'll always remember the thrill of witnessing my first successful Dempsey spawn with large male and female herding their brood of hundreds of fry about the aquarium. I was a teenager then and watched the Dempsey spawning process with wonder and excitement. Now some twenty years and probably a million cichlid fry later, the sight of a large

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Right:
These young
Pterophyllum scalare
are just beginning to
metamorphose into the
typical angelfish shape.
Photo by H. J. Richter.

Above:
Juvenile oscars are much
more boldly colored than
adults. Photo by R. Zukal.

Below:
The marble angelfish is one
of the hardest of the many
strains available today.
Photo courtesy of Wardley
Products Co.

Above:
A South American cichlid,
Cichlasoma severum,
cleans its chosen spawning
site. Photo by R. Zukal.



mated pair of Central or South American cichlids in full color swimming protectively with their fry still excites me, partly because it's one of nature's most impressive displays and partly because it brings back memories of those green years of my youth.

times be disconcerting. After a tough day at the office one likes to relax. Unwinding while seated in front of a discus, *festuam* or angelfish tank is easily done. Innes put it well: "They swim like swans asleep." But if one has an upsetting day and tries to relax in



But my continued interest in South and Central American cichlids goes beyond merely a case of fond nostalgia. There are other reasons why these cichlids more than hold their own in any comparison with the sexy new African imports.

While the Africans' dazzling colors (which frequently rival those of marine specimens) and their boundless energy look extremely attractive in display tanks, all that darting about can some-

The oscar is by nature a very curious fish. Many hobbyists claim that their pet oscars recognize them and react differently to them than they do to other people. Photo by Dr. Herbert R. Axelrod.

front of a well-stocked mbuna tank one can quickly develop an uncontrollable facial tic. In addition, the larger African specimens like *C. frontosa* or big breeding size *H. moorii* will "spook" at the flick of a light switch.

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Even after months in the same environment, a quick move in front of the tank which houses my breeding colony of *frontosa* and it's panicsville!

While occasionally similar spooking takes place among South and Central American cichlids, particularly among the uaras, the big South and Central American specimens are almost always as steady and calm as big John Wayne. The giant cichlids of South and Central America are so self-assured they have permitted many a hobbyist to pet them. In fact, one of the dealers in my area has trained his massive pair of oscars to ring a tiny bell which hangs just above the water line of their tank in return for a Tetra-min tablet. I dare anyone to duplicate that feat with a *Melanochromis auratus*!

royally on mature red devils and Texas cichlids, the bump on the head of *H. moorii* is anything but royal, it's a bit grotesque. Then look at the fish's lips, which are generally slightly opened. Like Al Jolson in blackface, the *H. moorii*'s lips are overdone, pronounced and comical, the eyes motionless. The fish looks cold and fishy. Then look at the face of an adult *Tropheus moorii*. The circular head looks like the helmet worn by astronauts. It's like coming face to face with something from outer space.

To me most large African cichlids exude the same warmth as a large male *Lamprologus compressiceps* that I once stared at for a long time knowing something was wrong but not being able to figure out the cause of my concern. He was suspended between two



Look deeply into the face of a discus or oscar or any of the big South and Central American cichlids and you're looking at a pretty face, a placid beautiful living piece of nature. What's more, there's a good chance the discus or oscar will approach the glass and look at you with the same fascination.

But did you ever really look closely at the face of an adult *Hoplochromis moorii*? Look into its face and study its features. (If the fish isn't spooked by your face, you'll generally be ignored, so take your time.) Even though I am a sucker for frontal gibbosity and relish that great Brahma bull lump that sits

A pair of Jack Dempseys prepares its spawning site. The Jack Dempsey has a pupilistic temperament and thus bears the name of the famous prize-fighter. Photo by R. Zukal.

rocks, perfectly motionless for a full fifteen minutes. Then suddenly I realized what the problem was—he was dead!

The most striking difference between the South and Central American cichlids and the Africans is in their breeding habits. With some exceptions, the big South and Central American cichlids choose a suitable spawning site, clear and clean the area and get down to breeding. Frequently, it's

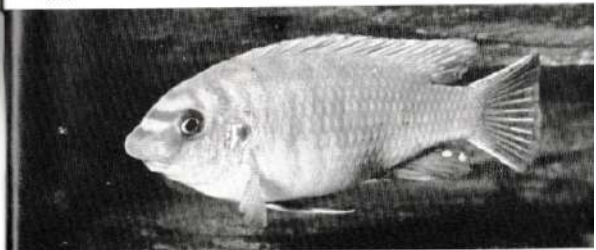


way out in the open in full view of their other tank neighbors and any human audience who might be watching. Lip-locking, fertilization, fanning the eggs, transporting the fry from place to place, shepherding the shoal about, all is done with great drama and flair. The South Americans have fiery Latin temperaments during breeding; among themselves and others they'll fight and breed, and they'll stand their ground.

The underslung mouth of *Labetropheus fuelleborni* gives this African cichlid a comical look that resembles a Dr. Seuss character in one of Seuss's books for children. Photo by G. Marcuse.

The firemouth, *Cichlasoma meeki*, is a colorful Central American species; compared to many of the other non-dwarf New World cichlids, it is relatively peaceful. Photo by R. Zukal.

At this writing one of my large mated pairs of bright orange red devils is spawning in the exact center of a 450-gallon community tank which is loaded with a dozen other massive, tough cichlid customers from south of the border. The devils are spawning—and every other fish in the tank knows about it. I know about it, my wife and kids know about it. No pussyfooting around with this big pair of fish.



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April, 1977

(Continued on page 86)

As I See It...

On a recent visit to my home town I noticed a sign in the window of a dry-cleaning shop that advertised, "For ecology's sake, please return hangers." This sign really worried me, because throughout my coursework in ecology, nowhere did I find mention of the wire hanger as an endangered species or as being part of any ecosystem. Did I miss something? Did the university's diabolical scheme to divert funds from academia to athletics and the ultimate production of the country's number one college football team cause my education to suffer so badly that the school couldn't afford to offer essential courses such as wire hanger ecology?

I have long been aware that the wire hanger is a prolific species. After all, if you put two of them (presumably a male and a female) in a dark closet and open the closet door a month later you will find a twisted tangled mass of the loving couple's progeny sedately hanging on the pole! But let's be realistic: in spite of the wire hanger's high fecundity, is the wire hanger really a threat to man or vice versa?

You might wonder what all this has to do with the tropical fish hobby. I'll tell you... nothing... and that is just my point! It seems that everybody uses the word "ecology," but hardly anybody understands or cares what it means.

The term ecology is today one of the most misunderstood, misused and abused words in the English language. In the case of the cleaning shop, the sign could have more accurately read, "To keep your cleaning costs down, please return hangers." No, I'm not one of those radicals who begrudges business its due profit! I just think that we should call a spade a spade and not conceal our motive as the meritorious campaign of one more "do-gooder!" If we are going to use a word that has many far-reaching implications, we should first take the time to find out what the word really means.

To many tropical fish hobbyists ecology means having a nice-looking collection of fishes in a sterile aquarium that is uncluttered with beer cans, hangers, algae, mulm or any other sort of debris. In a very literal sense these hobbyists are right, for ecology is commonly defined as the interaction of organisms with their environment, and these fishes certainly are interacting with their environment. If that is your

pleasure, then I say enjoy it. I would not deny anybody his pleasure as long as it poses no danger to anyone. My only hang-up with this concept is that those of you who choose to keep your fishes in this manner should not delude yourselves or others into believing that what you have is a miniaturized ecologically balanced piece of nature in your home.

In order to understand the term ecology as it applies to the aquarium, let's first define an ecosystem. An ecosystem is all of the physical, chemical and biological features of any given area considered simultaneously. In a miniaturized ecologically balanced ecosystem, the confines of the aquarium are that given area, and ecology is the interaction of the organisms in the tank: the fish, the plants, the algae, the bacteria and other microbes with each other and with the chemical and physical features of the aquarium such as the water (its temperature and chemical composition), free and dissolved gases, gravel, rocks, mulm, the filter, the heater, the background, the lights and even the aquarium glass itself. It is just about impossible to isolate any one of these components as an entity and say that its withdrawal from the system has no effect on the system... anything you put into or take out of the system has an effect on it.

Let's look at a grossly oversimplified example of how organisms and their environment are interdependent even in the aquarium. The health and well-being of your fishes depends to a very great extent upon the chemistry of the water that you have provided for them. Conversely, the chemistry of the water depends somewhat upon the condition of the fishes. If the water is too acidic, certain fishes may not eat well. Uneaten food decomposes, and the by-products of that decomposition cause the water to be even more acidic. Other tank inhabitants might flourish in more acidic water, and due to their better health will get more food. This may prevent other fishes from getting enough food, and their growth will be stunted. Few aquarium plants, including certain beneficial algae species, can survive in highly acidic conditions. In their absence, a good portion of the carbon dioxide emitted by the fish and microorganisms as a respiratory byproduct and normally used by the plants during photosynthesis remains in the water, causing even more acidity. Without flourishing plants which continuously lose old leaves and grow new ones, little mulm will form on the bottom. Without some of that mulm, beneficial organisms that provide food for certain small fishes and fry could not exist. Some of the organisms that inhabit the mulm even serve to keep bacteria populations in check. So the absence of a small amount of mulm might result in runaway bacterial blooms, and you'll have cloudy water, more acidity, more microorganism fatalities and a snowballing imbalance of nearly everything in the aquarium.

Complex though it may seem, this is an oversimplifica-

tion, and I'm sure that those of you who are ecologists will readily agree. This example only scratches the surface in defining the true complexity of a balanced ecosystem. It is not very likely that anyone will ever establish perfect ecological balance in an aquarium—perfect balance doesn't even exist in nature. An ecosystem, be it in nature or in the aquarium, is not static... it is dynamic... it is constantly changing. Without providing most of the necessary components of the ecosystem, you will never even come close to achieving any sort of balance in your aquarium. All of the components of an ecosystem provide a finely tuned system of checks and balances, and these components or factors tend to buffer each other.

I have always maintained the position that if you want to have a truly representative piece of nature in your home, you must pay attention to all of the ecological factors of the ecosystem that you are trying to simulate. Neglecting or omitting any one of them will in the long run cause more problems for you and your fishes than including them will. Even though the television medium would like us to believe that nature is clean and sterile, it is not; yet nature has somehow managed to survive for eons. Paying attention to ecology in maintaining an aquarium does not make aquarium keeping more complex, nor does it produce more work for the aquarist; rather, it simplifies the process and makes aquarium keeping the relaxing repast that it is supposed to be.

Because this is an editorial and not a feature article, I cannot go into the details of maintaining ecological balance here. But for those of you who are interested, I will include some feature articles on this subject in the very near future.

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Greater Pittsburgh Aquarium Society Bud has, with a lot of help from Claire and many other dedicated hobbyists, helped the club increase its membership from less than 90 members to over 240 members in just a little over a year. In addition, Bud has written about 60 articles for the journal of his own club as well as those of several other clubs in the Pennsylvania-Ohio area. Besides being authoritative in what he writes about fish, Bud is also a notable traveling speaker who addresses aquarium societies around the country on a far-ranging variety of subjects from organizing societies and programs to prevention and treatment of fish diseases and the rearing and breeding of cichlids, killies and a host of other species with which he has had much experience.

Although Claire told me that she had to get into the hobby in order to stay married (by the way, fellas, Bud is not too proud to admit that he shares all the household duties with Claire too) I happen to know that she is a hobbyist in her own right. Only such a dedicated hobbyist could figure out

Donald, Claire and Duane—or is it Duane, Claire and Donald?—do some reading research on one of their new fishes. Photo by Bud Welty.



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Tropical Fish Hobbyist



Bud picks through a spawning mop for killifish eggs. Photo by Claire Welty.



Bud feeds newly hatched brine shrimp to some of the Welty's cichlid fry. Photo by Claire Welty.

how to feed 140 tanks of hungry fishes in 30 minutes, three times a day, and still have time to tend to the needs of their twin sons, age 11, and hold down a part-time job as a bookkeeper. Somehow, Claire also finds time to care for her own oranda goldfish and serve as treasurer of the Greater Pittsburgh Aquarium Society as well as editor of the club's quarterly journal.

Their sons Donald and Duane are also avid aquarium hobbyists (would you expect them to be maybe stamp collectors?). Donald is a marine hobbyist and has maintained several *Amphiprion* species in good health for over a year and a half. He is also the trainer and keeper of Iggy, a two-year-old iguana that has grown in that time from four to over 30 inches in length. When I visited the Welty's, Don took me up to his bedroom to show me how Iggy eats out of his hand. Unfortunately, the appearance of my be-whiskered face must have frightened the daylight out of Iggy, for he quickly ducked into the nearest rock shelter in his glass domicile!

Not to be outdone by his twin brother, Duane has become a livebearer expert and is currently raising some sailfin mollies that would make most of the old pros turn green with envy. Duane, like his brother Don, got into the hobby strictly on his own and does not really try to compete with the rest of the family members. If he ever does, watch out, Bud—there may be a new "Mr. Cichlid" on the horizon!

After receiving a complete tour of their hobby rooms, Claire, Bud, and I settled down at the kitchen table with a fresh pot of coffee and began to delve into what it is that makes this dedicated hobbyist, Bud Welty, really tick. I asked Bud a series of direct questions and the answers follow here.

TFH: How long have you been a tropical fish hobbyist?

Welty: For 27 years. I started at the age of nine.

April, 1977

TFH: What particular incident was responsible for bringing you into the hobby?

Welty: My next-door neighbors got tired of the hobby, so I inherited their three tanks and assortment of livebearers. I was immediately captivated and since then have never been without at least a few operating aquariums.

TFH: Since you have been so deeply involved in this hobby for such a long time, you must have had a number of noteworthy experiences. Would you tell us about some of them?



Claire inspects one of their male honey doobie-tail bettas. Photo by Bud Welty.



Bud and Claire use their microscope to inspect a tissue specimen from one of their recently deceased fish. Photo by D. Welty.

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Welty: The single most exciting experience I can recall was about 13 years ago, when two of my adult discus paired off and spawned. The nature of the excitement was that in those days very few people were having much success breeding discus and mine did so even though I did nothing special for them other than what I normally do for any old angelfish.

TFH: What has been your most rewarding experience in this hobby to date?

Welty: There have been several. One was when the Youngstown Area Tropical Fish Society established the annual Bud Welty Trophy for the best cichlid in their show. The other was seeing the membership of the Greater Pittsburgh Aquarium Society increase over twofold within just one year after I took office.

TFH: What particular aspect of the tropical fish hobby interests you the most?

Welty: I don't think I could single out one facet of this hobby and say that it

The Welty's have over 50 different species of mature African cichlids. Photo by Marshall E. Ostrow.

interests me more than any other. I find everything about the hobby fascinating.

TFH: From the robust healthy appearance of all the fishes I have seen here tonight, I would say that you are one of the most successful hobbyists I've met. To what do you attribute your apparent success?

Welty: A lot of people have asked me that. I think it is more a matter of what I don't do than what I specifically do. With few exceptions I don't add chemicals to my water, I spend very little time monitoring pH and DH. I don't constantly move fish about from one tank to another. I don't spend excessive amounts of time keeping my tanks immaculately clean and sterile, although I do remove any uneaten food, dead fish or any other potentially harmful debris. The only tanks that get any special attention are those that house my discus and my Tanganyikan cichlids, *Cyphotilapia frontosa*, *Lamprologus tetraocephalus* and various *Julidochromis* species, and the only extra thing I do in those tanks is buffer the water.

TFH: It sounds to me like you almost neglect these fishes, yet they certainly



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don't look neglected. Do you use any commercial products to help you over any of the rough spots that you surely must encounter at least once in a while?

Wetly: Most medications and tonics on the market today are good products and work well if used properly. However, for lack of proper advice or self-confidence, newcomers to the hobby tend to use some of these products rather indiscriminately. Very often diseases and deteriorating aquarium conditions can be headed off before they cause trouble simply by carefully observing the fish. After 27 years of fish keeping, you develop an intuitive feel for what is going on in the aquarium both chemically and biologically. I certainly don't neglect my fish. I do use medications occasionally, but I usually avoid having to do this by changing small portions of the water in each tank with a great amount of regularity, and I provide a great variety of foods for my fishes.

TFH: What kinds of foods do you use for your fishes?

Wetly: For the fry I use microworms



Claire fills a bag of live fishes with oxygen for shipment to a nearby hobbyist. Photo by Marshall E. Ostrow.

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and newly hatched brine shrimp alternated with finely ground commercial foods. Although I have been having some problem buying shrimp eggs and even more problems getting them to hatch, I find that by warming the eggs in the oven to about 150 or 170° F I'm now getting a satisfactory hatch. I don't know what lies ahead in this regard. My juveniles and adults receive 16 different kinds of foods every week. They get smelt, squid, beef heart, frozen adult brine shrimp, liver, ocean plankton, live tubifex, white worms, mosquito larvae, daphnia, several kinds of freeze-dried food and at least six different kinds of commercial dry foods. On such a diet our fishes seem to get all the nutrition they need, and none are obese. By avoiding obesity the fishes are much more prolific, they live a lot longer and are usually very active.

TFH: What do you do with all the excess fish that you raise? You certainly have a potential here for making a lot of money.

Wetly: Our excess stock is sold to dealers, and this produces enough revenue to allow our hobby to pay for itself. We're not interested in turning out a profit. We feel that if we were to start getting that commercial all of this would no longer be a hobby, and we would have to turn to other forms of diversion for relaxation—that, as far as I am concerned, would bring disaster to the fishes, because we would probably lose interest in them and begin to see them only in terms of dollars and cents. I think that hobbyists who allow their hobby to completely and totally dominate their lives are making a very serious mistake, and they may eventually wind up hating the hobby.

TFH: In light of some of the current legislative proposals designed to put restrictions on the pet industry, how do you see the tropical fish industry in the next five or ten years?

Wetly: In trouble! I feel that much of

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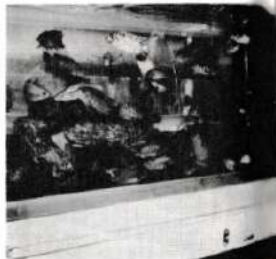
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the information we and the government agencies receive is blown out of proportion. You rarely hear about much else besides piranhas, oscars and the walking catfish. It's pretty obvious that only a few states such as Florida, Mississippi, Louisiana, Texas and maybe California might have a problem with released tropical species. So why should everybody in the remaining 45 states have to suffer? The federal agencies don't have enough real experts in the field of pet animals to be able to properly advise our legislators and keep things in perspective. The only way we can avoid disaster is by all of us swamping our legislators with mail to protest all of these misdirected restrictions.

TFH: Why do you feel that aquarium societies are so important?

Wetly: Two reasons, for one thing, a well organized society can be a valuable source of information for aquarium hobbyists who need help and often need it in a hurry. Also I think that participation in an aquarium society for junior members is a great way to produce the dedicated hobbyists of the future and at the same time help direct them away from other diversions that could be harmful.



This is one of the Wetly's large Malaysian community tanks. Photo by Marshall E. Ostrow.

As I drove back to New Jersey the day after this interview, I mentally reviewed all that had been said the previous evening at the Wetly's house. My thoughts were that here is a hobbyist whose kind of dedication is hard to find these days: the Wetly's not only enjoy their hobby but also seem to get some special enjoyment from helping other hobbyists.

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The International Beta Congress (I.B.C.) will be holding its annual convention June 24-26, 1977 in Toronto, Canada. Any hobbyists interested in attending should write for details to: International Beta Congress, c/o Keith Brown, 296 Woodworth Rd., Willowdale, Ontario, Canada M2L 2T6.

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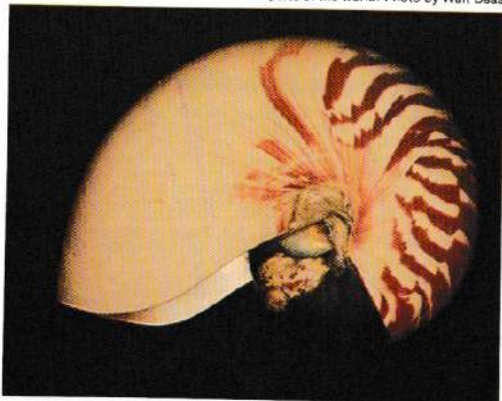


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Photo Above:
The knight fish, *Cleidopoma gloriamaris*, being a member of the family *Monacetrus japonicus*, its light organs are located at the posterior edge of the lower jaw. Photo by D.L. Savitt and R.B. Silver.

Photo Below:
The shell of the chambered nautilus, probably *Nautilus pompilius*, is commonly seen in shell shops in many parts of the world. Photo by Walt Deas.



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fishes' light organs were clearly visible. One can stand for some time in front of a tank of these fishes fascinated by both their form and their light-emitting capacity. In another tank, this one completely dark, was a real rarity. The sign above the tank said *Photoblepharon palpebratus*. This is a species closely related to *Anomalops katoptron*, the fish that I reported on in *Pacific Marine Fishes*, Book 6, the volume on Melanesia. But the tank was completely dark and we waited, hoping to see the display of light we were led to expect. Suddenly there it was! A relatively large greenish light began moving about in the water. Soon another joined it. We stood and watched as the lights moved back and forth in the tank. Then one blinked out and another on. What a spectacular sight! The lights are quite bright. I have read that in the Red Sea, where this species comes from, the lights have been misinterpreted from the shore (*Photoblepharon* is a shallow-water fish that comes out at night) as enemy attackers, and quite a bit of firepower was directed at them.

In Hawaii we were able to visit the Waikiki Aquarium. Besides a number of tanks of local and exotic fishes and invertebrates, they also had a star attraction—a real live *Nautilus*. Most people are familiar with the shells of

Nautilus pompilius that are commonly seen in shell shops, some natural, some "pearlized" or with the outer covering of the shell taken off to reveal the pearly nacre (and called the pearly nautilus) and some split down the middle to reveal the chambers from which the animal's common name of chambered nautilus is derived. But this one was alive and swimming about the tank before our eyes, much as we had seen them do on one of Jacques Cousteau's underwater adventure films. They are light-shy creatures, and the tank was dimly lit. A request that flash bulbs not be used was posted near the tank.

During a recent trip to the Philippines we saw hundreds upon hundreds of nautilus shells waiting to be sold. There is a ready market for such a beautifully decorative object as the nautilus shell. Why then do we not see live *Nautilus* for sale if they are so easily caught? Are they too expensive an item? Are they too hard to ship live? Are there legal or import problems? And how long will the supply last under such a tremendous fishing pressure?

Both *Photoblepharon* and *Nautilus* may make very good aquarium inhabitants. I am sure as the interest in these species increases they will eventually become available to the average aquarist.



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Oddballs



The Clown Knife Spawns

by Tony Berardo

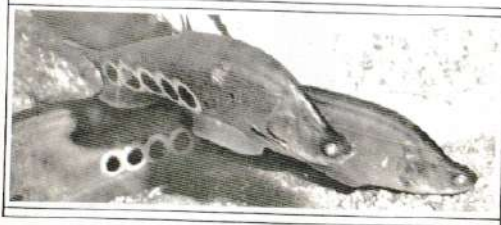
Spawning the clown knife fish (*Notopterus chitala*) has always been a difficult challenge to hobbyists. Its rare appearance in shops and home aquariums may have something to do with the mystique that surrounds its breeding.

My interest was kindled back in 1973 when I acquired a clown knife fish that measured 23 inches (58 cm) in length. The fish had outgrown its owner's tank, and the owner's bringing it to my shop proved to be my good fortune. My new acquisition turned out to

be a male, a fact which was determined later that year when I witnessed it spawning.

I already had a clown knife fish that was 26 inches (66 cm) long. Since there are no obvious sexual differences in this species, she had arbitrarily been named "Jack." After noticing my error, she was promptly renamed "Jacqueline."

In a large aquarium the clown knife fish, *Notopterus chitala*, can attain lengths exceeding two feet. Photo by Dr. Herbert R. Axelrod.

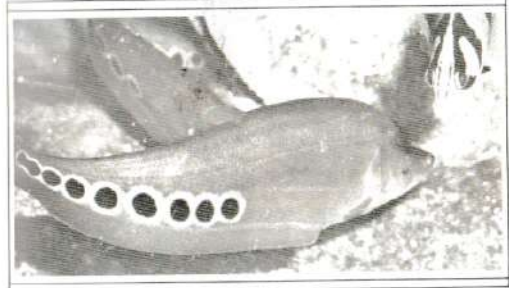


The male was placed in a 450-gallon (1,700-liter) aquarium where the female and several other large fishes resided. The clowns showed an immediate interest in each other, staying close together and almost constantly rubbing against each other.

The following week I noticed the fish attempting to move the artificial plants that were in the tank into one corner of the aquarium. Since the plants were not weighted, they soon floated to the top. Having read that in their natural environment knives spawn in shallow water on submerged bamboo shoots, I constructed some plastic plants three feet long with

chosen corner of the tank. Other changes in my handling of these fishes quickly followed. I gradually raised the temperature from 68° F (20° C) to 84° F (29° C) and began to change about 25 percent of the water every five to seven days. The pH was kept at 6.2 and the hardness was about 30 ppm. These maintenance conditions combined with their meaty diet apparently triggered the spawning.

One day after making a partial water change, I noticed the appearance of a breeding tube protruding from the vent of the female. This ovipositor was about one-half inch (12 mm) long and one-fourth inch (6 mm)



weighted bottoms. I placed these in the aquarium and, noticing no difference in their behavior, introduced some shale caves. They showed no interest in these at all.

I spent the next four months taking notes on what did and did not happen. Both of them ate goldfish readily, but this did not stimulate them into spawning. I did notice, however, that after feedings of beef heart and live brine shrimp the female became quite aggressive, pushing the male into her self-

The clown knife is a territorial fish. Here it challenges a Siamese tiger fish that has entered its territory. Photo by Dr. Herbert R. Axelrod.

in diameter, reedy in appearance and tapered to a point. It was interesting to note that the female apparently used this tube for cleaning the spawning site, a large piece of shale. The female's cleaning behavior continued for several hours with frequent interruptions to attack the male, seemingly in an attempt to involve him with the task



The early juvenile clown knife fish has an obliquely striped pattern rather than the characteristic spots of older juveniles and adults. Photo by Dr. Karl Knaack.

at hand. When the male's breeding tube became visible, the female eased up in her aggression toward him. Eventually both fish worked together, cleaning the site and moving the artificial plants over the spawning area.

After the water temperature was raised the fish began a ritual of rolling against and over each other. When the

egg-laying started the female's body was parallel with the bottom of the tank. She expelled ten to fifteen eggs at a time. After the first deposition she pursued the male until he fertilized the eggs. Thereafter he became a willing partner, and the pair stayed together throughout the remainder of the spawning activity. This activity was not



The female clown knife pays particularly close attention to the eggs. Photo by Bob Carissimi.

interrupted by feeding, and after the spawning was over both parents became very protective of the eggs.

Other fishes in the aquarium had gradually been removed prior to the spawning with the exception of a 10-inch red devil and a 24-inch *Perrunichthys perruno* catfish. This proved to be most unfortunate, as the red devil ate

the eggs before they could be removed from the tank.

Having learned a lesson and gained some valuable knowledge, I'll go on to spawn them again. This proved to me that it can be done, and with time many fishes previously thought difficult will breed in the aquarium.



The breeders guard their eggs, which they have placed on a rock. Photo by Bob Carissimi.



The female's ovipositor protrudes from the vent just ahead of the anal fin. Photo by Bob Carissimi.

Deep Freeze Aftermath

As a direct result of the recent deep freeze which gripped much of the midwestern and eastern portions of the nation, the commercial ornamental pet fish industry, which provides 85% of the U.S. demand for ornamental fishes, has suffered substantial losses on 350 to 400 Florida fish farms. Losses on Gulf Coast farms ran as high as 95%, while losses on Atlantic Coast farms ran between 30 and 40%. With the aid of Governor Askew of Florida, the industry has qualified for federal disaster relief funds.

Mr. Dan Fix of Roberts Fish Farm said that the critical minimum temperature for most ornamental fishes falls between 52 and 54° F (11 and 12° C). Under normal winter conditions the 8- to 16-foot deep ponds maintain a minimum surface temperature of 60° F (15.5° C) and bottom temperature of 64° F (18° C). During the recent freeze temperatures dropped down to 40° F (4.5° C) on the bottom and 50° F (10° C) on the surface of Florida's west coast ponds and 44° F (7° C) and 55° F (13° C), respectively, in east coast ponds. Some farmers were able to cover some of their ponds with plastic covers, but that didn't help too much, since the covers were quickly covered by an inch of snow.

Mortalities were noted within 48 hours in firemouth cichlids and common guppies. Most other livebearers and all of the egg-layers quickly followed. Affected fishes were noted to become darkened and lethargic as they dropped to the bottom of the ponds, with complete mortality in most

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species following within 96 hours at temperatures less than 52° F (11° C). It was also noted that the fish demonstrated a greatly reduced metabolic rate, stopped feeding and failed to maintain the protective mucus slime layer. The last-named condition was noted to have caused severe losses at a later time in the survivors due to acute mouth and body fungal infections with secondary bacterial infections. The survivors are difficult to trap and cannot tolerate any form of handling.

The impact of this catastrophe is already being felt on the retail market. Both domestic and some imported species (those held in outdoor ponds) have experienced a 25% increase in wholesale price, with an additional 25% increase expected later this spring. Imports from Southeast Asia, which in the past have provided 5 to 10% of the U.S. supply, have rapidly increased to fill the void in the market. It is generally felt that imports will not be able to satisfy the sustained demand that is expected to last up to 18 months for some species. Commercial growers are already working together to inventory the limited available stock and to spread it out as much as possible in a cooperative effort to rebuild the industry.

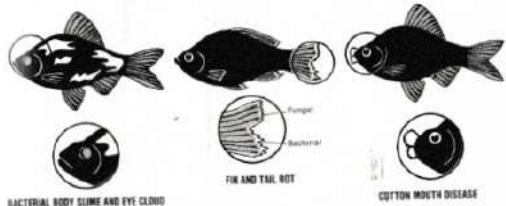
Along with all of this bad news comes at least one small item of good news. One of the hardest-hit species during this cold spell has been the walking catfish, an exotic import whose escape into Florida waters has brought some serious problems to the industry in recent years.

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Danios (fishes of the genera *Danio* and *Brachydanio*) are lively, easy to care for and well suited to many types of community tanks. These cyprinids are native to southern Asia and are found primarily in flowing streams and other small watercourses, although they may be found in ponds during the dry season.

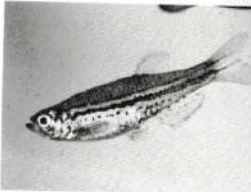
Being constantly on the move, their behavior resembles that of the smaller American minnows. Danios are full of energy and should be kept with other species as lively as themselves. These fishes love to play just beneath the surface, and they dart after food with lightning speed. Danios are at home in any area of the tank—on the bottom, in the middle regions or near the water surface—but they do show a preference for swimming near the surface.

The smaller danios of the genus *Brachydanio* may be kept in a relatively small aquarium, and the zebra danio is an excellent species for the beginning hobbyist with limited equipment. Fishes of the genus *Danio* are somewhat larger and require more space than *Brachydanio* species.

These fishes do not dirty water as quickly as some other shoaling fishes such as the barbs, and normal filtration is usually sufficient to keep a danio tank clean. Danios prefer turbulent water, which can usually be achieved by using a power filter and directing the clean water output across the water's surface. On the whole these fishes are very hardy and will readily accept almost all foods offered. Their water should be clear and rich in oxygen. The temperature should be maintained between 68 and 78° F (20-26° C), and normal aquarium lighting is sufficient.

There are several danios that you are very likely to see in local pet shops and a few that only appear occasionally. The zebra danio (*Brachydanio rerio*) is a magnificent dark blue fish with gold bands. Its small size (1½-2¼

inches or about 3-5 cm) and contrasting colors surely make this one of the most often kept fishes in the hobby. The pearl danio (*B. albolineatus*) comes in two different color varieties: one fish is grayish white in color; the other has an over-all golden tinge. It is an active, shimmering species that will stop passers by with its reflected sheen. The leopard danio (*B. frankei*), a relatively recent discovery, is silver-blue in color with numerous small gray spots. Although one of the most beautiful danio species, the spotted danio (*B. nigrofasciatus*), is not seen very often in local aquarium shops, be on the lookout for this beauty; it's worth seeking out. The giant danio (*Danio malabaricus*), fairly common in pet shops, is the largest of the common



Because of its combination of stripes and spots, the spotted danio, *Brachydanio nigrofasciatus*, is often mistaken for a hybrid between the striped zebra danio and the spotted leopard danio. It is not a hybrid but is a distinct species. Photo by G. Timmerman.

danios and reaches lengths of up to five inches (12 cm) in the aquarium. This peaceful and very active fish is a brilliant silver-blue in color with alternating blue and yellow horizontal stripes. Smaller and less brilliantly colored than the giant danio is the Bengal danio (*D. devario*). This hardy, active fish comes from northwestern India and is rarely kept by hobbyists.

All of the danios breed in a similar

manner. They are egg-scatterers but will expel their spawn in open water as readily as over plant thickets. The eggs of *Brachydanio* species are non-adhesive, so most will fall to the bottom. The eggs of *Danio* species are adhesive and will stick to the first thing they touch. Danios are all avid egg eaters, but most of the eggs can be saved by spawning the fish in shallow water over a bed of glass marbles or thickets of Java moss. Even clumps of color-fast synthetic yarn will serve as an effective egg-protecting spawning bed.



Photo above: A male giant danio, *Danio malabaricus*, (front) pursues a ripe female over a clump of Java moss. Photo by R. Zukal.

Photo below: Like most danios, the giant danio eats its eggs almost as fast as it expels them. Here the female (left) is hardly out of the spawning embrace when she begins to eat the eggs. Photo by R. Zukal.



Photo above: The male giant danio usually makes his spawning approach from above the female. Photo by R. Zukal.

Photo below: When danios spawn within the spawning medium instead of above it, fewer eggs are eaten. Photo by R. Zukal.





Photo above: The leopard danio, *Brachydanio frankei*, is one of the most attractive of the smaller danios. A school of these smartly speckled beauties makes an interesting aquarium exhibit. Photo by H.J. Richter.

Photo left: A male pearl danio, *Brachydanio albolineatus*, (left) spots a ripe female and begins pursuit. Photo by R. Zukal.

Photos below: Left—After expelling and fertilizing some eggs, the pearl danios begin the chase anew. Right—The spawning embrace. Photos by R. Zukal.



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The eggs hatch in 36 to 48 hours, depending upon the temperature, and the fry, which initially have a huge yolk sac, will be free-swimming in about a week. The fry can take newly hatched brine shrimp or powdered dry foods as soon as they start to swim.

Because of their active movements, danios are best displayed in groups of not less than four. They tend to form schools and will constantly move as a group from one end of the aquarium to the other as if magically tied together by an invisible thread. They sterile



Danio devario looks something like its congener, the zebra danio, but is not as colorful and is fairly imperiled. Photo by H.J. Richter.

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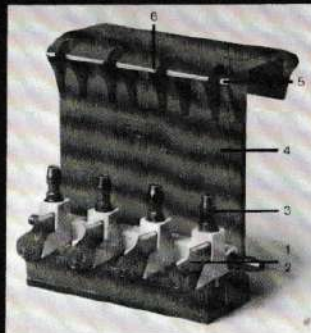
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easily and tend to jump when frightened; consequently a tight-fitting cover is a necessity to ensure that their occasional jumping tactics will not result in "missing" fish. If you are looking for fishes to add activity to your present community tank and at the same time would like to try your hand with an egg-layer that's a breeze to spawn, danios would be a sure bet.

Photo sequence: 1. The ever-popular zebra danio begins the spawning chase. 2. The spawners chase in a circle. 3. As the fish finally embrace, eggs can be seen falling into the Java moss below. Photos by H.J. Richter.



1



2



3

A second color form of the pearl danio is occasionally seen in shops. It has more of a grayish cast than the more common form. Photo by S. Frank.



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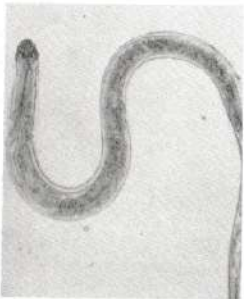
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Your Fishes' Health

Camallanus

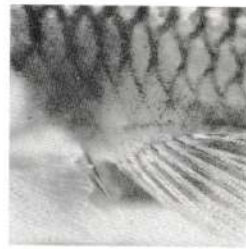
by Dr. Mark P. Dulin

Have you ever noticed semi-transparent to blood-red worms protruding from the anus of your aquarium fishes? These 1/4- to 1/2-inch (6 to 12 mm) worms may be small, but they can be quite deadly. As you may have guessed, the parasites' red coloration comes from the fish blood they have ingested. These parasites cause anemia, poor growth, eventual emaciation and often death.



Because *Camallanus* ingest large quantities of blood and tissue fluids from their host, it only takes a few of these worms to kill a small fish. Photo by Dr. G. Schubert.

Most aquarists that write us about these intestinal nematodes describe their occurrence in livebearers (Poeciliidae) such as guppies, mollies, platies and swordtails. They describe them as sticking out of the anus; when an infested fish is agitated or handled, the worms retreat into the rectum. Although other parasitic nematodes live an equally disgusting existence in aquarium fishes, most of the preserved specimens that readers have sent me were members of the genus *Camallanus*. Judging from the extensive list of



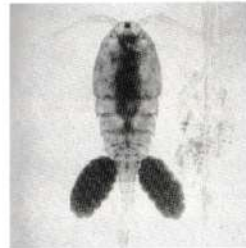
This enlarged photograph reveals two camallanids protruding from the anus of a guppy. Photo by Dr. G. Schubert.

fishes reported to have *Camallanus* infections (1), all freshwater fishes should be considered susceptible to parasitic invasion. These parasites also occur in amphibians and certain reptiles.

Undoubtedly many fish die without a sign of a *Camallanus* protruding from the anus. In these instances, a post-mortem examination would reveal these parasitic nematodes. When aquarists write us about these worms, they want to know two things: how did they get there and how can I get rid of them?

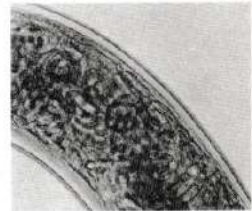
How did they get there?

Among coldwater fishes, *Camallanus* are distributed worldwide. The species infecting fishes in our rivers and lakes may not survive in the warm-water aquarium, but they certainly are a threat to production ponds, minnow farms and backyard goldfish. Whenever items are collected in natural waterways and placed in fish ponds, the threat of disease transmission exists. This is especially true if copepods are brought into the ponds. Both in fresh water and salt water, free-



After the *Camallanus* larvae are ingested, they undergo a period of development within the *Cyclops*. When infective *Cyclops* are ingested by fish, the *Camallanus* continues its development at the expense of its new host. Photo by Dr. R. Geisler.

living copepods often act as intermediate hosts in the transmission of parasitic helminths such as tapeworms and roundworms. *Camallanus* is most commonly transmitted by *Cyclops*. Unfortunately, *Cyclops* is commonly ingested by fishes in the natural environment. In outdoor production ponds where *Cyclops* exists and when *Daphnia* is harvested from the wild and offered to your captive fishes—don't kid yourself into thinking you can har-



This photomicrograph of a gravid *Camallanus* female shows numerous developing larvae. Upon release, these larvae molt and are generally eaten by copepods of the genus *Cyclops*. Photo by Dr. G. Schubert.



Camallanus are characterized by possessing a slit-like mouth and a buccal capsule with two lateral chitinous valves. This longitudinal view reveals the rib-like thickenings of the camallanid's chitinous valves while still attached to a piece of the fish's intestine. Photo by Dr. G. Schubert.

vest *Daphnia* from a pond and not include *Cyclops*!

If our native American species of *Camallanus* are generally not associated with disease in the tropical aquarium, where are these parasites coming from? No doubt the varieties we're dealing with originated in the tropics and were transmitted here along with the imported fishes. Singapore is considered the source of origin for the tropical species which have worldwide distribution in tropical aquariums (4). As you may be aware, many of the inexpensive livebearers come from outdoor production ponds in Singapore, Hong Kong, and Florida. The more valuable strains are generally raised indoors. If outdoor production ponds are inhabited with infective *Cyclops* (and possibly other copepods) a *Camallanus* infection could occur. It was previously thought that *Cyclops* was necessary for the successful transfer of *Camallanus* from fish to fish. Therefore, if you could eliminate the *Cyclops* you could perhaps eliminate the spread of *Camallanus*. Unfortunately,

recent experimental evidence showed that this is not the case. Dr. Gottfried Schubert and M. Stumpp (4) recently shed some new light on the cycle of *Camallanus cotti*, the tropical species imported from Singapore. Schubert and Stumpp demonstrated that it is possible to maintain three successive generations of the parasites without an intermediate host. Transfers past the third generation were unsuccessful. Even though *Camallanus cotti* cannot survive indefinitely without its intermediate host (*Cyclops*) it is interesting that this parasite has adapted to ensure survival of the species in the temporary absence of an intermediate host. Schubert and Stumpp further pointed out that this imported species has adapted sufficiently to infect cold-water fishes such as surgeon and Chinese carp. It is entirely plausible that it could infect native American freshwater fishes as well.

Treatment

Dr. Schubert recommends the organophosphorous insecticide tri-

Outdoor production ponds are great for raising many of the inexpensive livebearers hobbyists have become so fond of. Unfortunately, these ponds also favor the development of *Cyclops*, the intermediate host for *Camallanus*. Photo from *Koi of the World*, courtesy of Kodansha Ltd.



Photo above: When the eggs of *Cyclops* hatch, the nauplius larvae (above) emerge. Within a month (under optimum conditions) they molt six times to become adult *Cyclops*. Unfortunately, the adults are not finicky and ingest almost anything, including newborn *Carassius*. Sure as death and taxes, young fish eating infective *Cyclops* develop a *Camallanus* infection. Photo by C.O. Masters.

Photo left:

Like *Camallanus*, this species of parasitic nematode (*Philonema gubernaculum*) uses *Cyclops* as an intermediate host. Detailed life cycle studies of this parasite were recently conducted by the Dept. of Fisheries at the University of Idaho. These studies showed that impoundment of natural waterways (dams) caused both an increase in the number of *Cyclops* and a corresponding increase in the number of fishes infected with this nematode. Photomicrograph by Dr. Jim Chacko.



chlorfon to destroy both the internal nematodes and the copepod intermediate hosts. Trichlorfon is commonly used to kill insects on plants and for ectoparasite control of cattle, horses and sheep. It is also used for endoparasitic control in swine and rhinos. Its use with fish is generally limited to removal of ectoparasitic copepods such as the "anchor worm." It is sold at both plant supply stores and livestock outlets under a variety of trade names such as Dipterex, Dylox, Dyrex, Chlorphos, Bot-X, Masoten, Neguvon, etc. The concentration of the active ingredient varies with the different products. Therapeutic doses are based upon the level of active ingredient. Dr. Schubert recommends placing 0.32 mg/liter of trichlorfon into the aquarium after the filter has been deactivated. Because trichlorfon (Dylox®) is used extensively for control of ectoparasitic copepods (0.25 ppm for freshwater fishes, 1.0 ppm for saltwater fishes) we know that the drug is rapidly dissipated and becomes ineffective. The rate of hydrolysis varies depending on water temperature, pH, water hardness, etc., but generally speaking, when placed in warmwater aquariums the chemical is considered to have no more therapeutic value after several hours. Dylox® does not harm the beneficial bacterial flora in the biofilter, but it is highly toxic to crustaceans and *Camallanus*. Accidental overdoses can kill your fishes, and it is also a potent toxin to man and other living things. Every precaution must be taken to assure that pets and children do not come into contact with this poison.

I do not encourage the average aquarist to use contact insecticides such as trichlorfon. A safer and more readily available drug for removal of intestinal nematodes is piperazine. Most veterinary clinics have piperazine, a dewormer for kittens and puppies, in assorted milligram sizes. When mixed with the food, the suggested

dosage for fishes is 25 mg/10 grams of food. The medicated food should be fed daily up to a maximum of 10 days. If you don't have any method to measure out 10 grams of food or if your fishes refuse the medicated food mixture, you can mix finely pulverized granules of the drug with a prepared gelatinous food mixture.

As far as I know, controlled experiments evaluating the efficacy of piperazine as a dewormer for fishes have not yet been conducted. Aquarium firms promoting medicinal agents for use in fishes could provide a valuable service by sponsoring such research. Until such time that this work is done and an anthelmintic (dewormer) is marketed for use in aquarium fishes, the aquarist will have to prepare his own piperazine-impregnated food or use the organophosphorous insecticide trichlorfon to rid his fishes of *Camallanus*.

Acknowledgments

I would like to express my sincere appreciation to Mrs. G.L. Hoffman, Stuttgart, Arkansas for translating Dr. Schubert's article and to Dr. Gottfried Schubert for permission to use his excellent *Camallanus* photos.

References

- Hoffman, G.L. 1967. Parasites of North American Freshwater Fishes. pp. 253-254. University of California Press, Berkeley and Los Angeles.
- Schubert, G. 1972. A New Fish Enemy. *IN: Tropical Fish Hobbyist*. pp. 14-21. December, 1972.
- Schubert, G. 1974. Care and Recognize Aquarium Fish Diseases. pp. 38. T.F.H. Publications, Neptune City, N.J.
- Schubert, G. 1976. *Camallanus cotti* (Nematodes), a danger, not only for exotic fishes. pp. 19-21. *Revue Française d'Aquariologie et Herpétologie*. 3:1.

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Mail Call



by Marshall E. Ostrow

If you have an aquarium question that you would like to have answered, send it to MAIL CALL. Letters containing questions of course cannot be acknowledged or answered personally, but each month a number of the most interesting questions and their answers will be published in this column. Address all questions to MAIL CALL, T.F.H. Publications, Inc., P.O. Box 27, Neptune City, New Jersey 07753. Please do not confuse MAIL CALL questions with correspondence about subscriptions or book orders.

Homemade Aquarium

Q. I am interested in making a tank out of wood and I was told that there are various types of synthetic materials that can be used to cover the inside surface so that it won't leak. Can you tell me what kinds of materials I can use to make a marine and a freshwater tank?

Leonard J. Morgan
Washington, D.C.

A. We can think of a couple of reasons why you might want to make your own tank: one is to save money, and the other is to have a tank that has an unusual size or shape. With the advent of all glass aquariums neither one of these reasons has much practical value.

The best basic material to use for making your own tank is marine plywood and, as any boat owner will tell you, this material is outrageously expensive. For inside coating you can use epoxy paint or fiberglass resins of various types. Neither of these materials is as impervious to decay as is glass, and tanks coated with these materials must be broken down and recoated almost every year. Wooden tanks also have a limitation on the number of decorative backgrounds that can be used on them since, in order to see the background, it must be placed inside the tank.

Modern all-glass aquariums are available in almost any size and shape

you could possibly want and actually cost less than making your own wooden tank. In addition, many aquarium manufacturers guarantee their products for five years or more against leaks. If your dealer does not stock the type of tank you want, ask him to show you his manufacturer's catalogs and special order the tank of your choice. Very few dealers would decline such a proposition.

All Shook Up

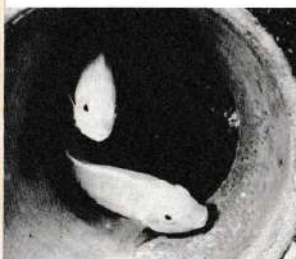
Q. I am having some cichlid problems. I have six convicts (three striped and three pink), two Jack Dempseys, one jewel and one Texas blue in a 20-gallon tank. The problem is with the convicts. I have the hardest luck trying to raise the fry. Whenever one of the pairs mate, I move the other fish to a reserve tank and wait for the eggs to hatch. This is when the problem starts. I never know when to take the parents out. It's either too soon or too late. Any help will be appreciated.

Dave Ramsey
Warren, Michigan

A. Your fish are suffering from the crowded tank syndrome, a "disease" that is caused by most enthusiastic new aquarists with large aggressive territorial fishes, all of which are fighting for their little piece of territory. It

April, 1977

67



The golden conchlet, *Cichlasoma nigrofasciatum* is a prolific fish that will spawn under almost any aquarium conditions. Photo by R. Zukal.

amazes us that they haven't all committed hari-kari by now! To add a little more fat to the fire, you are disturbing the blissful couples every time you reach in to take the other pagulists out. Although convict cichlids do spawn rather easily and do defend their territory rather fiercely, under these conditions it is a wonder that they have spawned at all! We suggest that you drastically thin down the tank's population. This will most likely solve your problems and will probably permit the parents to peacefully rear their own fry.



The convict cichlid vigorously defends its territory against any intruder regardless of size. Photo by R. Zukal.

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Bedotia geayi, the Madagascar rainbow, is one of the most colorful members of the family Atherinidae. Photo by R. Zukal.

Gorgeous Geayi

Q. In *Freshwater Fishes, Book 1* I saw a photo of *Bedotia geayi*, a gorgeous fish from Madagascar. I wanted more information on this beauty but found it was not covered in *Illustrated Dictionary of Tropical Fish*. Before I purchase this fish, can you tell me something about it and where I might buy it?

Aaron R. King
Colombus, Wisconsin

A. The Madagascar rainbow is a peaceful active fish that likes some swimming room and prefers slightly alkaline water. It reaches about three inches at maturity. This species spawns near the surface in clumps of vegetation. Bushes of *anacharis* or foxtail would be an ideal spawning medium. Although this is not a killifish (it is an atherinid or silverside), its sexual activities follow a similar pattern; that is, it lays a few eggs every day rather than large batches less frequently.

As to where to purchase this fish, we are frequently asked where a given species may be purchased. Unfortunately, we have no way of knowing which dealer is ordering which fish. There are thousands of tropical fish dealers in this country, and if we were to keep track of their stock we would have little time to produce this magazine or any of our books. We are publishers and it is simply not practical for us to function as a clearing house for tropical fishes. If the dealer of your choice does not have this fish and is not willing to order it for you, then you will have to keep looking in other shops until you find it. By contacting a local aquarium society, you might be able to find out who is currently carrying this or any other species.

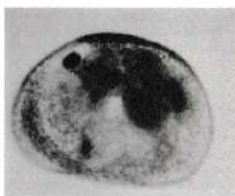
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Most tropical fishes will not eat ostracods because of the hard shell that encapsulates the animal. Photo by Dr. R. Geisler.

they probably won't harm your fishes, the only other alternative is to "live and let live."

More detailed information on these organisms appears in *Encyclopedia of Live Foods* by Charles O. Masters.

Calculating Aquarium Capacity

Here's a quick way to determine the actual gallon capacity of any aquarium. Using inside dimensions, multiply the length by the width and multiply that product by the height, all in inches. Divide the final product by 231, and the result will be the gallon capacity of the aquarium.

Cloudy Water

Q. We have a 130-gallon aquarium full of milky water. We have checked all possible causes known to us and cannot find out what's wrong. The tank shouldn't be overcrowded, since it only houses 25 fish, and we don't overfeed. We have cleaned the entire tank, changed the gravel and checked the pH level. We use two power filters and several air stones in the tank, but still have cloudy water. Please tell me if there is any solution to this problem.

Lee Russell
New Orleans, Louisiana

A. You apparently have some sort of bacterial bloom in the water. This is often known as the "new tank syndrome." After several weeks of continuous filtration and aeration the problem should clear up by itself, provided you are not adding material to the tank that might accelerate the bloom, such as undetected bits of uneaten food. You would have greater success in clearing up the water if you could temporarily move all of the fish to another tank. There would then be no new material being added to the tank to provide food for the bacteria. After a while the bacteria populations will stabilize and the water will clear up.

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Swimming Clams

Q. I have encountered a type of living organism in my five-gallon aquarium that I can't identify and can't get rid of. It is a brownish color and somewhat translucent. Its organs are visible through its shell. The shell looks like that of a clam. The animal is capable of totally withdrawing itself into the shell. It has three segments to its legs which it waves as it swims free in the water. In addition to swimming free, it can adhere to the aquarium glass and rocks. I doubt if it is a water flea because its shell is not the same as a water flea's. I have been told that the organism lives and breeds in excessive fish wastes and uneaten food. Can you tell me what this organism is and how to get rid of it?

Vince Lee
Buena Park, California

A. From your description, it appears that your tank is infested with ostracods.

These little crustaceans generally inhabit the decomposing organic layer of stagnant waters almost everywhere in the world.

It has a hard shell and looks like a miniature clam. The organism itself will not harm your fish since it is basically a detrital feeder, but it may harbor other organisms that could harm your fish. Although they make good food for most small fishes, few fishes will actually eat them. This may be due to the hardness of the shell.

Once established in the aquarium, ostracods are difficult to get rid of. Before dismantling the tank and sterilizing everything in it including the gravel, you might first try starving them to death by removing their food source. In other words, make sure that no uneaten food or decomposing plant matter accumulates in the aquarium. If this doesn't work, then you'll probably have to break the tank down. Since

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Head-in-the-head

Q. I have a ring-tailed pike cichlid, *Oreochromis saxatilis*, that is about ten inches long, and I am having some problems with him. He stays at the bottom of the tank and doesn't eat. Every once in a while he dashes around the tank, then he comes to rest on the bottom again. He hasn't eaten for about a month. He used to relish live goldfish and whole brine shrimp. He is developing small holes on the top of his head. There doesn't seem to be any pus or outgrowths coming from these holes. I have tried copper sulfate and antibiotics, but neither of these treatments worked. Please help!

Michael Spadafino
Yonkers, New York

A. Your pike cichlid seems to be suffering from the classic symptoms of head-in-the-head disease, a disease which most often is reported as affecting diadema. The disease, however, does affect

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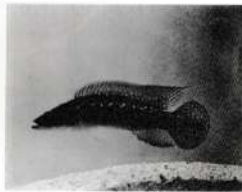
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Crenicichthys saxatilis, one of the pike cichlids, is a South American predator that can reach 14 inches at maturity. Photo by G. Timmerman.

other cichlids. The latest research on this disease indicates that the causative agent may be a protozoan parasite called Hexamita. There are no known medications sold by pet shops that can arrest this disease. There is, however,

a prescription drug called Flagey[®] which has been effective for some people in treating the disease. Since your fish won't eat, the first step in treatment would be the use of a long-duration bath. Use 250 mg per five gallons of tank water and keep the fish in this bath for about a week. If he responds and begins to eat, then follow the bath with the use of 1% medicated food. Complete details are given in Dr. Mark Dulin's "Your Fishes' Health" column in the December, 1976 issue of Tropical Fish Hobbyist.

Double Clean

Q. I would like to know if I can use an undergravel filter and an outside power filter at the same time on a 30-gallon tank.

John Ankner
Bronx, New York



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A. A double filtration system is a good idea, especially if you have a heavy fish load in your aquarium. Although there are certain benefits to having a small amount of muck accumulate on the bottom of the aquarium, such as providing organic matter from which plants derive their food or providing food and shelter for certain invertebrates which some of the fishes feed upon, too much of anything can do more harm than good. A supplemental power filter would prevent the undergravel filter from becoming overloaded and would considerably lengthen the time necessary between complete gravel washings.

Flowering Anacharis

Q. Is it rare for anacharis to have flowers above or below the surface of the water?

Ben F. Sloum
Racine, Wisconsin



Elodea densa has a single male flower that grows from the stalk and protrudes above the water. Photo by R. Zukal.

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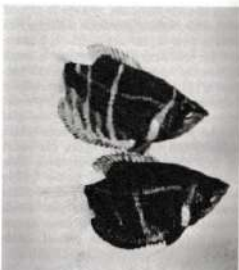
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A. *Elodea densa*, commonly known as anacharis, is definitely a flowering plant, although the flowers do not often grow in the aquarium. The male flower is almost colorless, has three petals and grows out of the water from the stalk. The female flower grows from a thin stem that branches off the stalk below the water surface, but it eventually grows to the surface. In the aquarium this plant is usually propagated by cuttings from the main stalk or from branches that have grown out of the main stalk. Most hobbyists clip the stalks as they reach the surface, and for this reason the flowers don't often have the opportunity to develop.



The chocolate gourami, *Sphaerichthys ophromenoides*, is a mouth-brooding fish that has very stringent ecological requirements in the aquarium. Photo by G. Timmerman.

Het Chocolate

Q. I am interested in keeping and breeding the chocolate gourami. *Sphaerichthys ophromenoides*, but

have found little information on them other than that which appears in your book, *Encyclopedia of Tropical Fishes*. Will the chocolate gourami live and breed in a 5 1/2-gallon tank or a 15-gallon tank? What is the best temperature to stimulate their breeding? What is the correct pH and DH, and should they have plants and rocks? Where I

live the pH of the tap water is 7.6, which I gather is just right for the chocolate gourami, but the water is fluoridated. Will the fluoride harm the fish? Thanks for your help.

Stephen Cheng
Montreal, Quebec

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A. The chocolate gourami is found in nature dwelling in hot steamy plant-choked swamps in certain parts of tropical Asia. Accordingly, it requires very warm water (62 to 85° F or 28 to 30° C) that is very soft (a DH of 1 or 2) and slightly acid (a pH of 6.4 to 6.8). The tank should have plenty of plants to provide the shade that the species is adapted to. Rocks probably are not necessary. Your chances of success will be much greater if you use a 15-gallon tank. Some people have kept them successfully in fluoridated water while others have failed. The fish's ecological requirements are so stringent that their failure to survive in fluoridated water may actually be due to other factors and not the water's fluoride content.

A Can of Sardines

Q. I recently attempted to breed a pair of kribensis in a 5 1/2-gallon tank. The fish were well fed and had a clear divider between them. Five days after placing them in the tank I removed the divider, and the fish quickly engaged in the cichlid rituals, lip-locking and color-flashing. Suddenly the large female attacked the male and a little later the male reciprocated. After a number of attacks and counterattacks both fish seemed to be ill. I separated the fish but both eventually died. Can you tell me what went wrong?

I also have a ten-gallon aquarium that contains a pair of gold gouramis, a five-inch black knife fish, five other gouramis, two neons, two two-inch angels, two catfish and a four-inch

sucker. The gold gouramis have been fighting and the male looks shredded and very ill. In addition, the knife fish won't eat. Can you tell me what is wrong in this tank too?

Spencer Sherman
Bayside, New York

A. Most of your problems seem to stem

from overcrowding. In the case of the kribensis we recommend a ten-gallon tank for breeding. This aggression could have just been a case of individual incompatibility brought on by their crowded condition.

Your other tank is badly overcrowded and we are surprised that your neons have survived in the company of aggressive predators such as angelfish and gold gouramis. This crowding is no doubt why the gourami is being picked on.

As far as the knife fish is concerned, most knives are nocturnal species preferring to hide under rocks, plants or other shelter during the daylight hours. You might try dropping some food in the tank at night after you turn the aquarium light out. Eventually, if suitable shelters are provided and the tank is dimly lit, the knife fish may come out to feed during the daylight hours, but probably only if you reduce the number of inhabitants in this tank

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Pelvicachromis pulcher (formerly *Pelmatochromis kribensis*) is a riverine cichlid that has a fairly wide distribution in the Niger River delta and other close-by areas of western Africa. Photo by R. Zukal.



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Pert Pigmy

Q. I have ten pigmy catfishes (*Corydoras hastatus*) in a 20-gallon aquarium which also houses my baby livebearers. I would like to breed these catfish but need some information. What chemical conditions do they prefer? Is there any



The pigmy corydoras, *Corydoras hastatus*, is one of the smallest members of the genus, reaching only one and one-half inches at maturity. Photo by G. Timmerman.

ATTENTION FISH HEALTH SPECIALISTS

As part of T.F.H.'s continual desire to serve the needs of the aquarist, we would like to publish a complete listing of diagnostic services available to the aquarist, importer, breeder or retailer of tropical fishes. Fish health specialists who are willing to accept tissues for bacteriological identification, virus detection, or histopathological examination are urged to send the following information to T.F.H.: Name, qualifications, address, phone number, species accepted, services offered, charges (if any), and preservation and shipping instructions. As soon as possible, send this information to Dr. Mark P. Dulin, T.F.H. Publications, 211 West Sylvania Ave., Neptune City, N.J. 07753.

special plant upon which they prefer to spawn? Will the livebearer babies eat their spawn?

Francisco Adrover
Levittown, Puerto Rico

A. The behavior of the pigmy corydoras is certainly atypical for a member of the genus *Corydoras*. It prefers swimming at mid-level in the water rather than on the bottom as do most of its congeners. Most *Corydoras* species deposit their eggs on a hard substrate such as a rock or one of the glass sides of the aquarium, but the pigmy prefers to deposit its spawn on plants. For spawning purposes, the fish will probably utilize almost any plant that you offer. In addition, it is not too fussy about water conditions as long as extremes are avoided. Many hobbyists

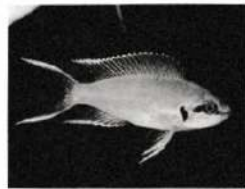
have had great success triggering *Corydoras* species into spawning by dropping the water temperature slightly. We have no reason to believe that the pigmy corydoras will respond any differently to a slight temperature decrease.

Most fishes will eat their own eggs as well as those of any other species, and your baby livebearers will probably show some interest in them. You will probably have more success if you remove them before attempting to spawn your pigmies.

Tanganyikan Trickery

Q. I recently purchased two *Lamprologus brichardi* that are about two inches long. At what length can you tell the male from the female? When are they at breeding size? At what pH and temperature do they breed? Is there any way to tell the male from the female other than the longer finnage of the male? I would appreciate any information you can give me.

Janet Salisky
Willoughby, Ohio



Lamprologus brichardi, a Tanganyikan substrate spawner, is not boldly colored but has a conservative beauty unmatched by most other cichlids. Photo by H.J. Richter.

A. There are very few external signs of sexual dimorphism in *Lamprologus brichardi*. The males do not necessarily have longer finnage at any age. Any differences in finnage that you have observed may only be attributed to individual differences and not sexual differences. There is only one reliable method of sexing these fishes besides watching them spawn, but that requires some close observation with a

NOTICE

Tropical Fish Hobbyist traditionally has its pages open to a broad spectrum of editorial features covering widely differing points of view. It also is open to commercial announcements of all sorts regarding products and services for sale. In fact, in most cases we are prevented by law from discriminating among advertisers.

There are a number of long-established and reputable mail order houses in the tropical fish field. There also are a number of firms that lack experience with this highly specialized method of selling and are not always willing or able to cope with the problems it creates for them in terms of customer satisfaction. On that basis, readers should always be aware of the dangers involved with making purchases by mail. Additionally, they should bear in mind that price alone—even for a standard manufactured item like a pump or filter—is not the only basis for deciding from whom it should be purchased. A "bargain" or "discount" price on an item may not be any bargain at all when it comes time to service the item or obtain information about it; what one seller offers by way of price may be more than offset by not having a reputable local tradesman to back up its servicing and delivery of full satisfaction. In general, products available locally should be purchased locally.

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hand-held magnifying lens. To use this method the fish must be removed from the water and held upside-down in your hand. The only abdominal opening clearly visible on the male is the anal opening, which is located anterior to the anal fin. The urogenital opening, located between the anus and the anal fin, is filled by the male's genital papilla which obscures that opening. On the female there are two visibly distinct openings, the anterior one being the anus and the posterior one being the urogenital opening. This method, of course, only works with sexually mature fish that are about three inches or more in length. See "Sexing Mbunas" by Warren E. Burgess in the August, 1975 issue of Tropical Fish Hobbyist for more complete details.

L. breichardi will readily breed in water having a pH of 7.8 or higher and a temperature in the high 70's. We have received some reports of their breeding at a somewhat lower pH

Northeast Council Workshop

The Northeast Council of Aquarium Societies is holding a weekend workshop featuring informal lectures and demonstrations that will be of interest to all aquarium hobbyists. The workshop is to be held May 20-22, 1977 at the Holiday Inn, Hartford, Connecticut. Room rates are \$23.00 single, \$29.00 double, \$4.00 per extra person. For more information or reservations contact: Mrs. Sandra Bailey, 447 Adams St., Manchester, Connecticut 06040. Tel. 203-647-1997.

Erratum

The guppy photo at the bottom of page 70 of the January, 1977 Tropical Fish Hobbyist was erroneously credited to A. Noznow. The correct photographer was Viktor Dazkewitsch.

value, but your chances of success will be much greater at a higher pH.

American Specialty Organizations

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(Cichlids: Continued from page 15)

On the other hand, let's take the Africans. If they're substratum spawners, they are so secretive and gymnastic about their egg-laying that the only way one knows there is a spawn is that the fish don't come out to feed. Therefore, if you feed and no fish show up you know you either have dead fish or expectant parents; so you wait. If no bodies float up in a couple of days you know it is a spawn. Then the great event: the fry sneak out slowly with their parents, the whole group hugging the rocks like combat troops on a raid. Nothing flamboyant about it. No Latin spirit here. No trumpets heralding the great event. Almost apologetic for being alive. The mouthbrooders, however, are the most frustrating of all. When a pair of *managuense*, for example, spawns and is caring for eggs and fry, they must evoke human empathy. There is my tough-looking male with a twisted mouth, veteran of dozens of cichlid fights, sitting sheepishly inside a large flowerpot in the wee hours of the morning domestically lanning his mate's eggs. As a father, I can relate to that big fish, for I too have spent nights awake comforting and caring for my baby. That fish and I are united in some strange kind of pantheistic way, two living beings bonded together for a single procreative purpose.

But how does one relate to a fish, male or female, with its mouth full of eggs or fry, a distended buccal membrane stretched over its clutch? And where is dad? In a community tank he's probably off courting another female, trying to coerce her to fill her mouth with eggs. Or is that dad after all? If two or more males of the same species are in the tank, figuring out which one is the father is fine sport. Is it the big brutish male there, or that small thin silent one in the corner? Who did the deed, who's the stud? Where is dad?

After three years of breeding a dozen or more different species of Afri-

A pair of Texas cichlids, *Cichlasoma cyanoguttatum*, tenaciously guards its young. This is the only cichlid that is native to the United States. It is found throughout southern Texas. Photo by G. Marcuse.



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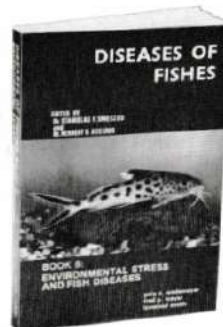
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April, 1977

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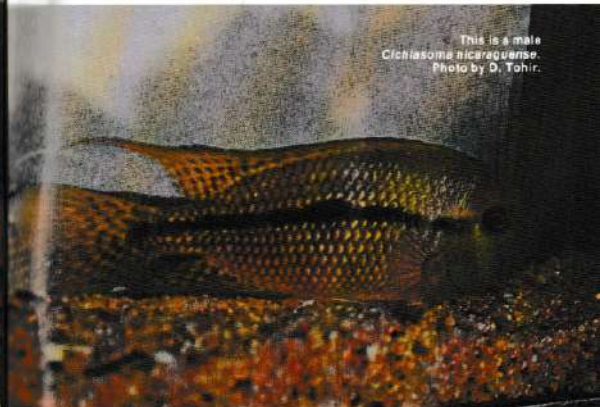
Cichlasoma managuense is an attractive fish that does well in the company of oscars and the like if it is given a very large aquarium. Photo by Dr. R. Goldstein.



Although not imported that often, *Haplochromis similis* is an attractive African species that could become popular. Photo by Dr. Herbert R. Axelrod.



This colorful male is a *Cichlasoma coryphaenoides*. Photo by Aaron Norman.



This is a male *Cichlasoma nicaraguense*. Photo by D. Tahir.

cans with enough fry to populate a large section of both Lakes Malawi and Tanganyika, I must admit that I've wit-

nessed only five actual spawnings of mouthbrooders—repeat, five spawns. With my 20 years of experience in fish-

A perennial favorite is the discus, seen here with some of its young feeding on its body slime. Photo by G. Budich.



breeding I must be considered as somewhat more than a casual observer, but these fishes are quick and sneaky. At least they are quicker and sneakier than I.

While *Cyphotilapia frontosa*, for example, is expensive and feisty hard to come by, individuals are a lot easier to find than good mated pairs of red devils, varus or severums if you know where to look. The large Central and South American standbys of the aquarium hobby are quickly becoming the rarities. On a recent trip to New York, every tropical fish store I visited had ample supplies of African cichlids, but in only one shop out of a dozen I visited was I able to find large mated pairs of South American cichlids—and their prices were staggering.

The African cichlid invasion, though waning somewhat in some

Haplochromis burtoni is a popular African cichlid which, like many other African cichlids, is a maternal mouthbrooder. Photo by R. Zukal.

areas of the country, is still very much with us. Before long the cichlids from Africa will level off in price and popularity and solidly take their place as standards in the aquarium trade. This will be as it should be, since the Africans are desirable fishes with many excellent qualities to reward the aquarist. But long after *H. moorii* specimens are being sold at discount shops around the country at 5 for \$1.00, there'll still be many serious cichlid hobbyists in their basements looking with satisfaction and wonder at large pairs of Dempseys and severums and their hundreds of fry.

Aquarium Plants

Vallisneria spiralis leaves grow in very tight spirals. Photo by R. Zukal.



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Vallisneria

by Phillip J. Brown

The plants of the genus *Vallisneria* have been known for a long time and have always been favorites with aquarists, the bright green strap-like leaves usually reaching the surface of the water and providing a green background among which other plants can be dispersed. *Vallisneria* species are distributed over a large part of the globe and are easily grown in most aquariums; they simply require some nutrient-bearing gravel and plenty of light. The gravel should be reasonably deep to allow the runners a chance to spread out and form a thicket. This also provides a clue for planting—allow room between the plants so they will be able to spread, and never fully bury the roots. Plant the crown just a little above the surface of the gravel. These versatile plants will easily grow in a sub-tropical or tropical aquarium. Plants sold for the pond are often the more robust and wider leaved *V. gigantea*, but this species can also be effectively grown in a larger aquarium.

There are two common species of aquarium vallis: *Vallisneria spiralis*, which is usually seen in European aquariums, and *V. americanum*, which is usually seen in American aquariums. Two forms of *V. americanum*, both with beautiful corkscrewed leaves, are widely known and sold; one is known in the trade as the "conterionist" and the other as "forma tortifolia," the former having the more twisted leaves. A common fallacy is that *V. spiralis*, which is often mistaken for *V. americanum*, gained its common name, corkscrew val, from its twisted leaves. The name is actually derived from the appearance of the

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V. gigantea has unspiralled leaves that will grow to the top of a tall aquarium if given plenty of strong overhead light. Photo by R. Zukal.



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The leaves of the seldom seen *V. portugallensis* do not show much spiralling, but they do have attractive puckered edges. Photo by R. Zukal.



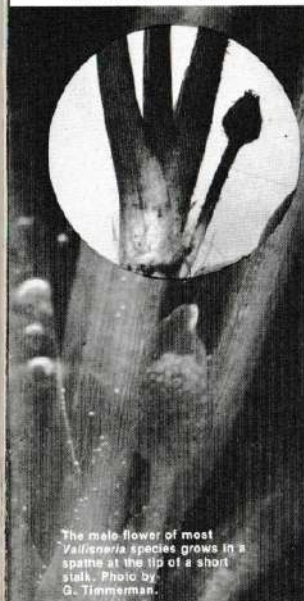
The familiar *V. torta*, now named *americanum*, usually propagates by runners and grows quickly in good light. Photo by T.J. Horemans.

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female flower, which grows at the end of a very long thin spiraling stalk and reaches the surface, where it awaits the arrival of the boat-like male flower that breaks loose from a bag-like spathe at the base of the leaves. Aquarium reproduction of *Vallisneria* species, however, is by new small plants that arise from runners or stolons. Once these new plants are a few inches high they can be separated and re-

planted if necessary.

All the *Vallisneria* species (there are about 10) are beautiful plants, the best known, *V. spiralis* and *V. americanum*, are perhaps the hardiest, most useful plants known to the aquarist. Too often taken for granted, they are, because of their beauty and biology, fascinating plants, and even today we don't know all their secrets.



The male flower of most *Vallisneria* species grows in a spathe at the tip of a short stalk. Photo by G. Timmerman.

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V. spiralis is a popular species usually seen in European aquariums. Photo by R. Zukal.

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Idea of the Month

Useful Cockroaches

by Jerome Winters

Having a supply of live food suitable in size for large cichlids often requires a lot of trouble. The food must be purchased or captured, and then kept alive until it is fed to the fishes. Maintenance often requires elaborate, expensive set-ups. Furthermore, there is always the danger that the organisms captured may have had some previous exposure to insecticides, so they could be harmful to your fishes.



Cockroaches, if not exposed to insecticides, make excellent food for larger aquarium fishes. Photo by Paul Imlund.

Another common problem in fish rooms and around aquariums in any room where fish food, brine shrimp eggs or other organic material may have been spilled and not entirely cleaned up is the presence of the ubiquitous cockroach. These rather unpleasant-looking beasts will appear in the cleanest homes as if by spontaneous generation if so much as

one tiny speck of food of almost any type is left exposed. The problem is compounded by the presence of moisture around aquariums; the moisture aids decomposition and seems to make the food substances even more attractive to cockroaches. (Don't let Mom or the wife see this article!)

The solution to both problems is to have a sure-fire method of capturing cockroaches without the use of poisonous chemicals, using a contraption that will keep the cockroaches alive without a lot of trouble or expense on your part. Here is a method that always works well for me and keeps me out of trouble with the rest of the family.

Start this simple project by visiting your friendly neighborhood restaurant or delicatessen and mooching an empty one-gallon wide-mouth pickle or mayonnaise jar. Clean the jar thoroughly and then rub a thin two-inch wide band of petroleum jelly around the inside of the jar, starting about two inches below the top of the jar. Place some bait in the bottom of the jar. This can be almost any food substance. I find that dog biscuits work best, since they stay in one piece while your unsuspecting victims munch away, and Rover won't miss one or two occasionally. The food is then easier to remove from the jar before you dump the cockroaches into the aquarium. The cockroaches must have moisture if they are to be in the jar for any length of time. Sufficient moisture can be provided by stuffing a small medicine vial with cotton or filter floss and soaking it in water. When the stuffing is saturated, remove the vial from the water, dry off the outside (do not cap it) and place it in the bottom of the trap near the food. The cockroaches also need shelter, since they will be living here permanently until they "move" into your fishes' stomachs. An empty toilet paper roll or a crumpled piece of newspaper will do nicely.

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