

November 1967

tropical fish hobbyist

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PRACTICAL GUPPY BREEDING

tropical fish hobbyist

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cover

How can you tell what color potential a female guppy is carrying in her genetic material? One way, of course, is to breed her and raise her offspring. But guppy breeders often have neither the time nor the space to find out this way. We sometimes hear of the hormone method of evaluating the color-worth of a female guppy. This method is deceptively simple: just put a measured amount of male hormone in a tank containing the female to be tested. Then wait until she shows color. The colors you see are the colors she will pass on to her offspring. Simple, not? NO! In all but the most experienced hands, this practice invariably leads to the worst possible trouble. The large fish on our cover is a female guppy, a potential breeder that was ruined completely by such a hormone treatment. She turned into a giant with a partially developed gonopodium. She cannot function as either a male or a female. Then, how does one choose his breeders? For one man's answer, turn to the article that begins on page 4. Photo by Rudolf Zukal.

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

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November, 1967

editorial

A recent scientific report tells of the almost-bacteria-free nature of the Rio Negro in South America. The report goes on to say that the river is also free of most forms of insect larvae that normally live in water.

The Rio Negro is one of several rivers having peaty colored, acidic water. It is most probably the low pH of the water that results in its relatively antiseptic qualities.

Several of our difficult or "impossible" to breed tropicals come from such waters, and part of the key to getting them to reproduce in our tanks must certainly be to provide them with the almost-sterile conditions to which they are accustomed in their home waters.

The cardinal tetra is found in the Rio Negro, and this species has long been known to require absolute cleanliness for optimum breeding results. Although it is still my opinion that most well-cared-for fishes can adapt to any reasonable conditions and can spawn in them, I also believe that a certain few species must be catered to in the matter of water chemistry if we are to get them to spawn and produce the maximum number of young. The cardinal is, of course, one such fish. Other fishes in this category include the harlequin rasbora, the neon, and most killies.

I'd be willing to give you pretty good odds that when someone finally spawns the black-winged hatchetfish it will be in water much like that found in the Rio Negro.

Mike Reed



In recent years Germany has begun to produce fancy guppies that challenge the best that the United States has to offer. The males produced in this strain are so uniform that they are practically duplicates of one another. Photo by Hansen.

Practical Guppy Breeding

BY FREDERICK J. KERR

Thousands of beautiful guppies are sent through the mail each year to hobbyists who are looking forward enthusiastically to joining the elite ranks of guppy breeders. Many of these hopeful breeders have even studied the principles of genetics and have worked out a devilishly clever plan by which they will develop a strain that will bring sighs of envy from their friends. In 6 months, the majority of these beginning breeders will have given up.

Why? Because the elaborate breeding plans are defeated, in part, by their own cleverness and because the breeder bases his programs on two assumptions which are not correct: first, that the best male produces the best offspring and second, that females can be effectively selected for breeding stock.

It is well known that female guppies do not show (with very few exceptions) the color, pattern and finnage that they pass on to their male offspring.

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Certainly treating with male sex hormone will express these characteristics but very, very few breeders work with this drug because it is not easily obtained and because it is a lot of bother. Most breeders, therefore, attempt to find a gimmick to select females. Some breeders contend that a female with a great deal of white on her tail fin will throw males with red fins, or that females with highlights throw the best blues. In fact, even though breeders will insist on the validity of these gimmicks, there is not the slightest proof that they work.

Turning to the males, breeders have traditionally assumed that the best male would tend to produce the best offspring. There can be no doubt that under certain conditions this is true, but it is also true that under other circumstances there is a tendency for the best male to produce offspring which are not as good as he is. If the breeder is dealing with a good strain, the tendency is for such a male to produce good males. If the strain is poor (produces very few good males) even the best males will tend to produce very few good offspring.

Can these two difficulties be overcome? Certainly. First let us deal with

Many German guppy strains are particularly good in that they show very intense color in their tails. This well blue guppy is from such a strain. American hobbyists might demand more intense color in the body as well. Photo by Hansen.



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the problem presented by the females. We should first of all assume that females *cannot* be selected for producing superior male offspring. (Granted that we could go to impractical measures such as hormone testing and cross testing.) The solution to this is really very simple: don't select the females at all! Simply choose them by random order or perhaps on the basis of some characteristic which is desirable *for females* such as large size and quick growth. So, we have selected half of the breeding population with little effort and no aspirin.

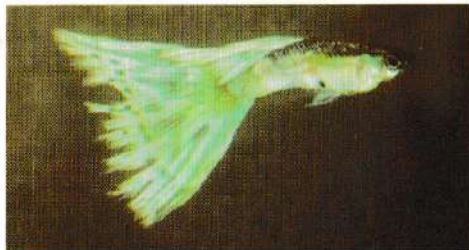
The word *population* is the key to the successful breeding program. Do not mate pairs, but populations. Do not set up one male and female, but six males and a dozen females in the same aquarium. If a single pair is selected, the breeder is putting all of his eggs into one basket. The female might not be able to produce any good males, or the male might be able to produce only a very few high-quality offspring. Using several parents in each generation reduces the chance of a bad selection ruining the entire next generation. While any one male might be likely to be a dud as a breeder, the chances that six good looking males are all duds are remote. The same is true of the females, but since we don't even have appearance to act as a partially reliable guide, more females are necessary. It is also very important that the offspring raised for the next generation come from as many females as possible to avoid the pitfalls of selection.

Now let us put all these notions into a working program. Let us purchase our initial breeding stock. Whatever the source of our stock, it is best to assume that it will be only moderately successful at producing good males. We would do well, if possible, to purchase a dozen females from a tank with a large number of good males and install these females in a 20-gallon tank. Males are really not necessary at this time since the females should have been fertilized by a large number of males. Often it is not possible to buy females like this. Then the beginner should buy as many trios of one male and two females as possible, preferably not less than three and certainly not less than two of these trios.

The next generation, the first raised in the beginner's tanks, is gotten by saving a few fry from each female. The number will depend on the number of adult females and on the ultimate size of the breeding population desired. Eighteen guppies, six males and twelve females, is a good population for a 20-gallon tank. It is a good idea to have three fry to be selected from for each breeder. Thus you will need to raise about 54 fry to get your 18 breeders. As soon as it is evident which are the males, they should be removed to separate quarters so that the females will remain virgin until the males have been selected.

When selecting males for the next population of breeders, do not neglect to look at the males of the previous generation. If they look better than any

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One secret in breeding good guppies is to know what you are selecting for and to be consistent in selecting for it. These two males are from similar strains. The strain represented by the fish above is one in which selection has been for exceptional broadness of tail. The strain represented by the fish below is one in which selection has been for a more rounded veil tail. The tail may continue to "fan out", but it will never be as wide as that of the fish above. If it did get that wide, the fish could not be used in the breeding program, because this would result in the wasting of all the previous generations of selection for a specific type. Photos by Hansen.



The black spotted tail pattern is becoming very popular in Europe. It is somewhat like the leopard or snakeskin pattern found in the United States. However, in Europe the spots are often confined solely to the tail, are more intense, and are arranged in concentric crescents. Photo by Hansen.

of the younger generation, do not hesitate to use them for as much as half of the male breeders. This allows even greater assurance that selection is not inadvertently eliminating good genes from the strain. After selecting your breeders put them together and discard the fish that remain. Many breeders wait as long as 6 months before selecting their breeders. This assures them of seeing the full potential of their males and gives the females a chance to "put on size" before their energies are called upon to produce fry.

The breeding procedure with the second population of breeders is the same as the previous one. The breeders are allowed to mate at random. Try to raise an equal number of offspring from each female or you will not be getting the full benefits of population breeding. The breeders for the third population are selected, hopefully with some improvement in the appearance of the males, and the procedure is carried out indefinitely from one generation to the next. When this procedure is used, improvement is relatively slow but constant. In a few generations the strain will have changed dramatically.

BOOK REVIEW*

ENCYCLOPEDIA OF WATER PLANTS

By Dr. Jiri Stodola.
Illustrated in color
by Mirko Vosatka.
T.F.H. Publications, Inc.
Jersey City, New Jersey.

The beauty of the illustrations (reproductions in color of paintings by a gifted botanical artist), the large number of plants adequately described in the well-printed text, the solid and attractive binding: these are the first things that catch the eye in this really splendid book. Both the author and the illustrator are Czechs.

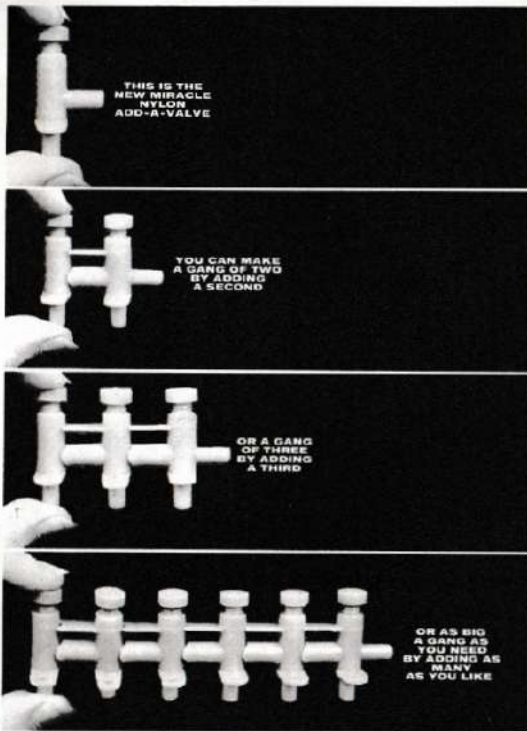
It is to the great credit of Dr. Herbert Axelrod, of T.F.H. Publications, Inc., that he should publish their work in so grand a style. Indeed, it is hard to imagine any subsequent book on aquarium plants — and this is what the book is all about — published anywhere in the world outshining it in the foreseeable future.

I believe it was William T. Innes who once said that an aquarium without plants is like a bird without feathers. But we all know, or ought to, that it is not just feathers, but fine feathers, that make fine birds. Reference to the *Encyclopedia of Water Plants* will enable any aquarium keeper to feather his tank, or tanks, not only usefully — in regard to the cover and oxygen

the right choice of plants will provide — but artistically. Furthermore, it will not take the aquarist with this book in his hands more than a few moments to look up just the plant, or plants, to fill his special needs; for the author has created (for the benefit of the non-technical reader) ten artificial groups of plants, which he refers to as Biological Types. Each group of plants has been given an identifying number. These are not dotted haphazardly about the book but rise in ascending order. After each description of a plant, or group of plants, the reader will find the appropriate illustration, or illustrations. Each plant is given its correct scientific name, with common name where known, its synonyms, and its country of origin. Its requirements in the way of lighting, planting medium and so forth are well covered. Other plants that will flourish with it in the same aquarium are listed. There is a generous glossary of botanical terms and a table showing the scientific classification of the plants written about.

I am so enthusiastic about this book that I would advise any aquarist with a deep enough pocket to buy two copies: one for ordinary use and one to preserve against the blemishes of frequent handling. Yes, the *Encyclopedia of Water Plants* is as good as that. — Jack Hems

*This review was printed originally in the August, 1967 issue of *The Aquarist and Pondkeeper*, a monthly magazine published in Great Britain. Our thanks go to both that publication and the author of the review, Mr. Jack Hems, for allowing us to reprint this material.



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Above—the female dolphin cichlid looks over the newly cleaned rock upon which she will deposit her eggs. Below—the female busily coats the rock with eggs. This is a particularly good shot of her breeding tube. Photos by Rudolf Zukal.



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The male waits patiently to move in and fertilize the eggs. Photo by Rudolf Zukal.

The Dolphin Cichlid, *Aequidens itanyi*

BY RUDOLF ZUKAL
BRNO, CZECHOSLOVAKIA

In the fall of 1966, I acquired four specimens of dolphin cichlids from the well known dealer H. Härtel, in Dresden. The fish withstood the long trip to Brno very well, but, in spite of this, one of them died after a week. Other than the information I had read in an account by Meinken, I knew nothing about this fish. The first specimens were imported by a dealer named Heinrich Espe. They came from the alkaline, deep waters of the lower Itany River in French Guiana.

The mature fish have a laterally compressed, almost egg-shaped body, and the younger specimens have a less elongated body. One of my three fish showed by his longer fins that he was a male, and I later found the other two to be females. The sexes had equal color, including pastel-colored sea-green and cinnamon-brown. A black line extends from the upper part of the

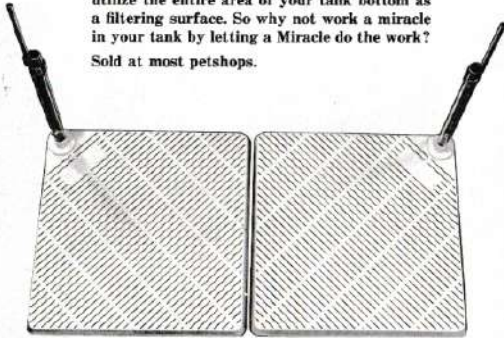
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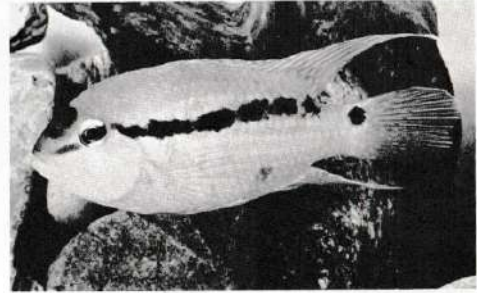
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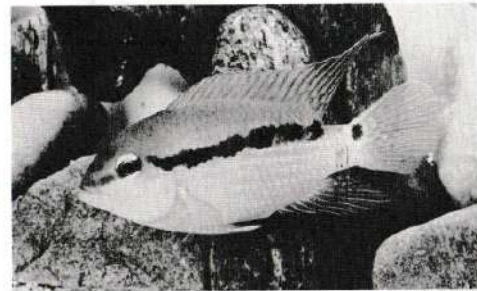
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The male dolphin cichlid. Note his size and the extent to which his dorsal and anal fins are elongated. Photo by Rudolf Zitel.

operculum to the end of the soft dorsal rays. Mr. Meinken says that fully grown specimens only occasionally show this stripe. It is replaced by six black, somewhat irregular spots on the sides. The iris of the eye is greenish

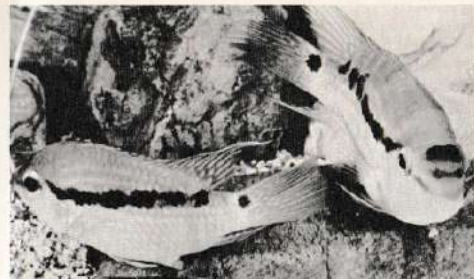
The female dolphin cichlid. She is smaller than the male and has less elongated dorsal and anal fins. Photo by Rudolf Zitel.



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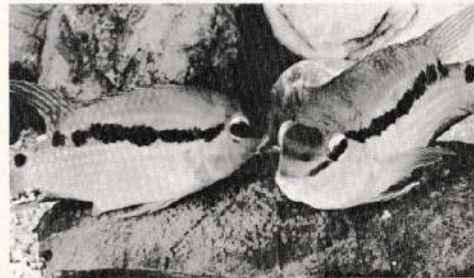


The male moves in behind the female as she plants egg after egg upon the rock. Photo by Rudolf Zitel.

gold. The fish are supposed to attain a length of 5 1/2 inches, with the female slightly smaller.

Because of a lack of space, I put the fish in a 25-gallon community tank with some other fishes. I never once observed any pugnaciousness with

Following the female in a circle, the male fertilizes her eggs as she lays them. Photo by Rudolf Zitel.

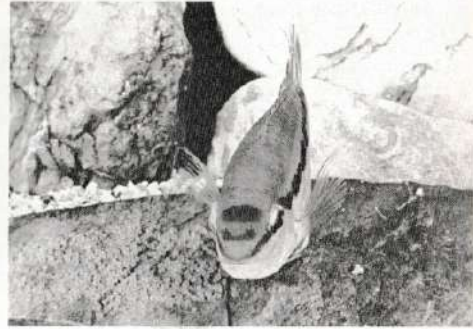
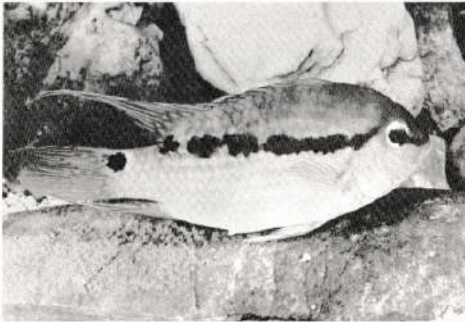


these fish. The only thing I could see that was out of the way was that a few plants were uprooted in a corner, and there were two holes excavated in the gravel. The smaller of the two female dolphin cichlids had torn fins and covered in the opposite corner of the tank. At feeding time I observed that this female gobbled down her food hastily and hurried back into the corner.

I could see by the behavior of the other two fish that they were ready to spawn. I prepared a 15-gallon tank for them. On the gravel I placed some rocks to give the fish a place to lay their eggs. The tank was filled with tap water at a temperature of 78° F. For a long time after the fish were put into this tank, nothing happened. The fish became extremely shy and scurried about through the water, even jumping out to bang against the cover glass a few times. This gave me a few anxious moments. I feared they had hurt themselves. For the first 3 days they even refused to eat anything. I walked very carefully when I entered the room and took great pains to make my movements smooth.

At last, after the fish were somewhat acclimated, I was able to take a photograph of the male. The elongated dorsal fin and anal fin were clearly visible. The activity of the photographing upset the pair considerably. The fish hid behind rocks, and their colors faded. Next morning I saw, much to my surprise that the female was guarding eggs. Spawning must have taken

The male's breeding tube can be seen to be both shorter and thicker than that of the female. Photo by Rudolf Zukal.



The spawning over, the male guards and fans the eggs. Note the dark markings on his forehead. Photo by Rudolf Zukal.

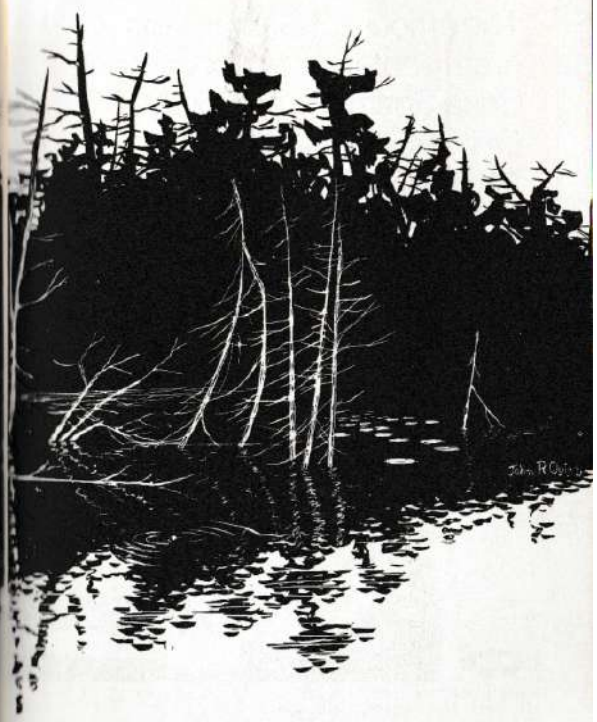
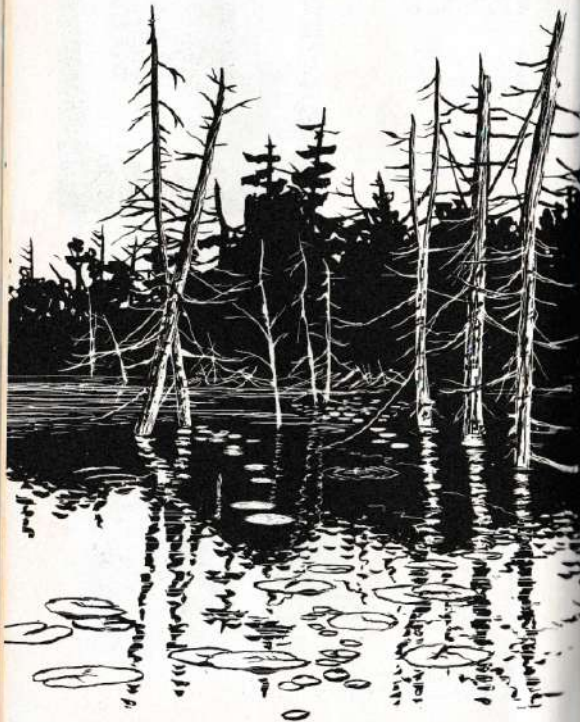
place during the night. This was a disappointment, because I wanted to photograph the spawning. On the next morning I could see some spoiled eggs, and by afternoon all the eggs had disappeared. Probably they were eaten by the male. About 2 weeks later the pair spawned in the afternoon during my absence. This time I tried playing it smart by taking out the male. But it was no use; the female ate the eggs.

Next I put the pair together and fed them sufficiently with live foods. At this time I was reminded how great an aquarist's patience must be. And this patience was rewarded: the first sign of the approach of spawning was the extended ovipositor tube of the female and the thorough cleaning the pair gave a rock. The first eggs were laid in strings by the female, but the male remained cautious and shy. In spite of this, he busily fertilized the eggs. These were laid very carefully, and I do not recall ever seeing one egg atop another. Spawning is accomplished by the female's first laying the eggs and the male's following after and fertilizing them. Thus, the fish constantly keep changing places. The male has a very small breeding tube.

This time I decided to take out both the female and the male immediately after they spawned. I stood the rock up in such a manner that a stream of bubbles from an airstone passed very close to the eggs. The result was that I got not only a series of pictures but also a school of 300 youngsters which at the present time are still swimming in my tanks.

The Strange and Beautiful Fishes of the Pine Barrens

BY JOHN R. QUINN
Academy of Natural Sciences of Philadelphia



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Continued from Page 29

the range of the fish's great barbed mouth. This grayish-brown catfish is peculiar to the acid water of the pine barren country and is best identified by the long white "whiskers" on the lower jaw. The large mouth comes in handy at night, which is the catfishes' time to eat. In the black-as-pitch waters, the cat roves endlessly, cramming its belly with anything and everything edible that it can find. Dawn finds the fish retreating to a favorite log, rock, or old sunken tire, for the cat dislikes being in the open during the bright day.

Poking and prying about the bottoms of the smaller streams and shallow lake edges is the little brother of the bigger cats, the tadpole madtom (*Schilbeodes gyrinus*). What he lacks in size he makes up for in the poison punch packed in his pectoral spines. A small brown catfish, rarely larger than 5 inches, the madtom is capable of delivering a severe sting both to large fishes with intentions of adding the little cat to their diets, and to unwary collectors alike.

In addition to the conspicuous inhabitants of streams and bog, there are many fishes that lead their lives virtually unseen in the protecting tangles of sphagnum and hairgrass. Two such fishes are the swamp darter (*Bolotichthys fusiformis*), and the mud minnow (*Umbra pygmaea*). A quick, darting form and a puff of silt are all one often sees of these shy and secretive little fishes which are important foods of the game species. The swamp darter has the interesting habit of moving its head to gaze at an object of interest while resting on the bottom. The fish is an active feeder, pursuing all forms of tiny aquatic life.

The mud minnow, an adaptable, small, sepia-colored fish with a conspicuous dark spot at the base of the tail, is found in weed-choked, muddy areas where other species cannot survive. This fish seems to show a degree of intelligence, and in an aquarium it can be taught to leap from the water for a favorite morsel. During dry periods, the "mudfish" will often leap from one pool to another in order to find safer quarters. He is also quite willing to jump 2 or 3 times his own length above water for an insect.

When examining a catch in the seine, one occasionally finds a dark, stocky fish with thick looking fins and a large mouth. This is a pirate perch (*Aplredoderus sayanus*), one of the strangest of the fishes of the barrens. It is never found in great number. Possessing an appetite to match the size of their mouth, the pirates are, nevertheless, difficult fish to keep alive in an aquarium. They are interesting, too, in that they have an anatomical oddity: their anal opening is in the normal place for a fish when they are young. But it gradually migrates forward. When the perch is mature, the opening is located just behind the gills, under the head! The purpose of this arrangement is not understood.

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T.F.H. PUBLICATIONS, INC., 245 CORNELISON AVENUE

A dainty, graceful, 2-inch fish moves slowly through the dense hairgrass. The fish's colors reflect the filtered sunlight with his every turn. It has every appearance of a jewel-like marine fish of some far-off tropical reef.

Then, not far away, a chunky, dark creature that is at least 17 inches long rushes to the surface, opens its cavernous mouth, and seizes a swimming water rat. Then fish and rat disappear in a shower of silvery bubbles which wiggle quickly up to the water's quick-silvery ceiling. Both of these fishes are at the opposite ends of the spectrum of a family known as the sunfishes (Centrarchidae). They are the small, beautiful, black-banded sunfish and the voracious large-mouth bass. They are studies in contrast not only in size but also in temperament. The former is a gentle creature given to hiding from enemies. The bass, however, is quite aggressive and will attack and eat almost anything it can swallow.

The Centrarchidae is well represented in the pine barrens, and has among its members many fishes favored as food fishes and many which are at their best in an aquarium. The mud sunfish (*Achantharchus pomotis*) is a striped, olive-green big-eyed, fish. Not widely known, it frequents heavily weeded sphagnum lakes, and when adult (at about 9 inches), it develops a great appetite and a vicious temper to match. Poles apart from this description is one of the gorgeous, angelfish-like black-banded sunfish. The similarity to the angelfish of tropical fish aquarium fame, begins with colors and markings. Irregular black bars vertically cross the fish's background color of tarnished silver. This combination is beautifully highlighted by a pair of salmon pink ventral fins and a carmine-tinted eye. As if to match this beauty, the little fish's disposition is such that it makes him ideal in all ways for the aquarium. A strange fact is that most of the banded sunfish sold to aquarists in shops are fish reared in Europe and shipped to the U.S. Apparently it is easier to get the fish this way than to collect them in the cedar waters.

Two relatives of the black-banded sunfish, and close seconds to it in beauty are the blue-spotted and the banded sunfishes. About the same size, but considerably more aggressive in nature than their black-banded cousin, both these sunfishes are well endowed with most stunning shades of blue and green arranged in spots and streaks. The blue-spotted has the longer fins of the two, and these fins are liberally speckled with dots of reflecting color. The banded sunfish is of a more chunky build, and the colors on its gill covers and body tend toward greens. On both species, vertical bars are usually evident.

All of the native sunfishes make interesting and striking aquarium inhabitants, reminding one somewhat of the cichlids. However, it would be wise to mention here that, in most cases, a state permit is necessary in order to collect these fishes in the wild for aquarium use.

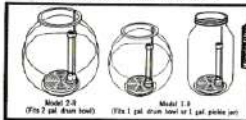
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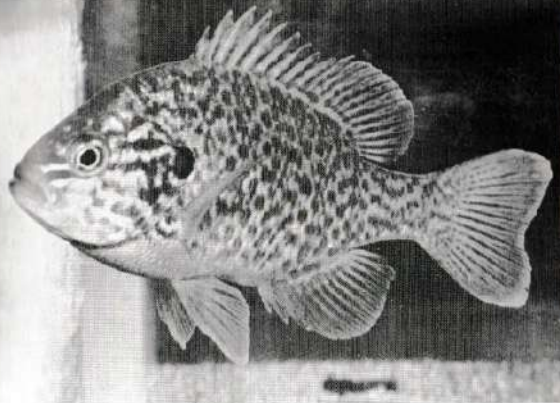
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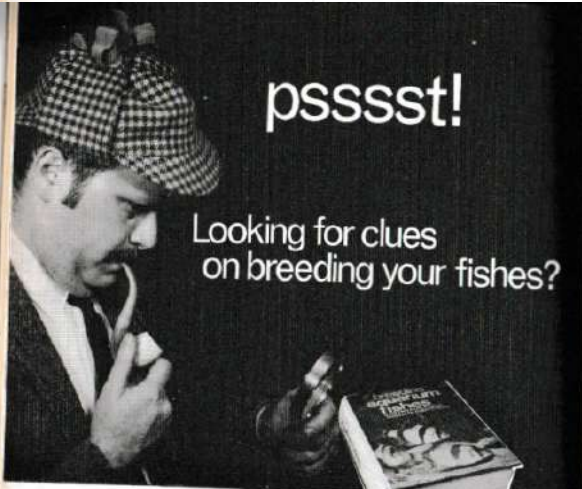
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Lepomis gibbosus, the common sunfish, or pumpkinseed, has been caught on hook and line by virtually every child who lives within its range. The fish is beautiful, but it is quite the bully with smaller species. Photo by Laurence E. Perkins.

Moving on to the last of the smaller species, we come to the common sunfish, or pumpkinseed, (*Lepomis gibbosus*). This fish is known and loved by all, from childhood on. The pumpkinseed is not as common in the pine barrens as it is elsewhere in its range, and I have never seen really large individuals in the barrens. This is probably due to the fact that the fish favors the same conditions in the pines as does the predacious pickerel which keeps many a fish from growing up.

There are many other fishes in endless variety to be found in the pine barrens. Most are less attractive to the aquarist than those I have described and too small to interest the fisherman. The chubsuckers (*Erimyzon sucetta*) grow large enough to be fished for with hook and line, and the young are quite attractive but generally decline in an aquarium due to feeding difficulties. They are warm-brown above, white below, and have a dark band from nose to tail. They have a typical minnow shape. Black bass, crappie, eel, and black bullheads, are just a few of the other varieties which are found in the acid cedar waters. Generally speaking, however, they are not as well suited for home aquariums as are the smaller varieties. This is due to both their pugnacity and their tendency to attain large size in relatively short periods of time.



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November, 1967

All About

BY STANLEY AND NAOMI LIEBERMAN

Labeotropheus fuelleborni

About 6 months ago we obtained a number of the widely discussed Lake Nyasa cichlids. Although we got several species and have bred them all, we will discuss only one at this time, *Labeotropheus fuelleborni*, Fuelleborn's cichlid. However, since our treatment of all these cichlids was almost identical, and the results and observations very similar, general data given may be applied to many fishes in this group.

Because of the fact that an exposed and well traveled area is used for all our aquariums, the 55-gallon tank that was primarily for housing the *fuelleborni* had been set up very much as a show tank would be. Additionally, since the natural habitat of these fish is a tropical lake, we believed that a planted tank would be more conducive to their breeding. The tank was filled with city water, directly from the tap, and 1 1/2 tablespoons of sea salt per gallon were added. In view of the fact that Lake Nyasa has a high salt content, we feel that this is an important factor in breeding the wild-collected fish. (It may also hold true for tank-bred individuals, but this remains to be seen.) The water was allowed to age for a full week. A standard No. 3 washed aquarium gravel was used on the bottom with liberal plantings of melon swords, giant amazon swords, Vallisneria, giant sagittaria, hygrophila, and anacharis. Floating plants were also fairly numerous. Rocks were added in generous quantity to achieve a pleasing appearance and create hiding places should things get rough. Two large power filters (and two air stones) were used, giving a filtration rate of about 300 gallons per hour.

The first fish into the tank were two *placostomus*, rapidly followed by two *Loricaria parva* and two bronze catfish, *Corydoras aeneus*. All were left in the tank without further additions for 4 days. We then placed five *fuelleborni* in the tank, two males and three females. At the time of addition of the cichlids, the pH was 8, the hardness was 220 ppm, and the water temperature was 80° F. Gro-Lux lights, on an automatic timing system, were on for 14 hours per day. This set of conditions was kept constant, in all respects.

We find that although sexing some Lake Nyasa cichlids is quite simple, *fuelleborni* are not so easy to sex, especially when they are not in their breeding colors. Our sole observations in this direction have been: egg spots on the anal fin of the female are lighter in color and sparser than they are in the male, and usually no egg spots at all appear on her dorsal fin. A scattering of egg spots may be seen on the anterior portion of the dorsal fin of the male. The female has a slightly more rounded body from the

pectoral fins back. While not breeding, the difference in color between a male and female *juelleborni* is slight, but an astute observer will note that the female's blue has an almost imperceptible cast of dull gold, while the blue of the male is a clearer and better-defined shade. When the fish are breeding, their color differences are greater, and sex identification becomes simpler. The blue of the female brightens to a more vivid shade, and the vertical bars on her sides appear much darkened. She may also display a dark reddish-brown coloration on the back edge of the tail and dorsal fins and on the bottom edge of the anal fin. The male, during breeding, turns a much lighter blue over his entire body, and during moments of actual courting, will be a pale "summer-sky" blue. A pronounced coloring of dark reddish-brown appears on the back edges of the dorsal and tail fins, on the bottom edge of the anal fin, and on the top edges of the ventral fins. However, we wish to point out that all these color changes are not nearly so pronounced as those which occur in *Pseudotropheus zebra*, a fish which resembles *juelleborni*, and careful observation of *juelleborni* must be made to become well versed in recognizing sexes.

Color change in the male *juelleborni* may occur very rapidly. The entrance of a net into the tank can cause it to change back from spawning color to normal almost instantaneously. If it is necessary to remove one particular male from a tank, we suggest that he first be segregated, for once he has fled into the crowd, his appearance may change so quickly and completely as to make him indistinguishable from his brothers and sisters. *Juelleborni* are fast swimmers and are quite cunning in avoiding capture. Their hide-aways are well chosen, and they do not foolishly or quickly venture out. We have known them to hover for a considerable time, motionless and in plain view, yet in an unreachable spot as we tried to catch them. Since we are far from patient, such duels are too often won by the fish!

Some points of which much has been made in every article on these African cichlids that we have read we wish to refute emphatically. These are the statements that these cichlids are difficult to quiet, have intractable and destructive natures, and that plants and decorative tanks are wasted on them. We maintain that, in our experience, the above are all completely in error. We keep eight different species of Nyasa cichlids and have never run into these problems at all. Our facilities for keeping fish are somewhat limited, and the fish are not under what could be called absolutely optimum conditions. All our tanks are in the main trafficway of an extremely busy office, and the occupants are, therefore, subject to a maximum of noise and outside-the-tank activity. Peace, quiet, or privacy, simply do not exist for any extended period of time. In spite of these adverse conditions, all these fish are calm in the extreme and exhibit no signs of fear, anxiety, or destructiveness. The *juelleborni* have not once destroyed any plants, nor

have they dug or moved any gravel. In fact, with the sole exceptions of one male zebra and one male *Juicy* who occasionally do dig gravel, none of these fishes have indulged in any of these much-celebrated activities. They became so tractable within a very short time that they would rise to the surface to be fed directly from the fingers, and, now, the sight of a person immediately in front of the tank is sufficient to bring them rapidly upward in greedy expectation. In view of these observations and the ease with which our cichlids were acclimated and bred, it has occurred to us that the undesirable traits of which we have read may well have been due to the fact that the environments provided were not suitable, and the fishes' reactions are their pitifully fruitless efforts to alter their environments to more acceptable ones.

Among themselves, however, a very typical cichlid temperament is most apparent in the Nyasa fishes. They skirmish and fight almost constantly, and pitched battles, although rare, can be observed. The rule of the day is rapid pursuit of one fish by another, to the point of the exhaustion of the fugitive. A definite "pecking order" exists among *juelleborni*, and the aggressive activities take place within this framework. We do not recommend that unevenly matched fish be placed in the same tank, both with respect to size and physical condition. A fish which is not in fighting trim and able to take care of himself, will not last long. A newcomer into an already well established community will be most unwelcome to all occupants and should be watched carefully for awhile. We find that introduction of a new fish is best accomplished at night, right before the lights are turned off. By morning the newcomer is more readily accepted. It will be interesting to see whether the temperaments of tank-raised *juelleborni* will be milder when they are adults. (At the present time, our *juelleborni* fry are approximately an inch long, and they are completely peaceful in their bare tank!)

Our *juelleborni* settled down in their tank with record speed and immediately proved to be greedy eaters. Their capacity for food is almost phenomenal, and nothing is refused. Feedings are at least twice daily and three times a day whenever possible. We vary feedings among the following: frozen brine shrimp, chopped earthworms, chopped beef heart, chopped beef liver, chopped fresh halibut, a large flake dry food, freeze-dried foods, and a dry vegetable food. The vegetable food is fed at least once a day, since from what we know of this species' eating characteristics in their natural habitat and from the physical shape and placement of their mouths, we feel that this is necessary for their well being. With the exception of a rare feeding of live brine shrimp, we offer no live foods whatsoever. The above diet is accepted voraciously, and we find that we must watch at least one feeding daily to ensure that something remains uneaten to sustain the scavengers in good health.

Eye fungus is the disease which is most prevalent (and, apparently, most deadly) among newly imported fishes of the *Pseudotropheus* and *Labeotropheus* genera. This is our observation as well as that of others who have numerous fishes in this group. Eye fungus usually starts as a gray film across the entire cornea of one eye. If allowed to progress, without treatment, it will spread to the other eye and get increasingly worse until it causes the death of the fish. In the advanced stages, the fish is completely without vision, and, being unable to see, it is also unable to eat, which rapidly accelerates the weakening of the fish. Eye fungus is also highly contagious to all other fishes. Numerous treatments with the usual remedies, such as silver nitrate, methylene blue and gentian violet, showed little effectiveness for us. Of the aforementioned, the best results were obtained by use of a "hospital tank" containing a strong solution of gentian violet and direct application of a 2% solution of gentian violet to the eye itself twice daily, using an artist's camel-hair brush. However, by far the most effective treatment we have used to date is a 10 milligram per 5-gallon solution of Neomycin Fungizone, which is available upon prescription, and which is manufactured by Squibb. (This is available in tablet form, containing 500 milligrams Neomycin Sulphate and 25 milligrams Amphocin B per tablet.) The affected fish is kept in this solution until completely free of any signs of eye fungus.

Another prevalent condition which has been noted on newly imported Lake Nyasa cichlids is the presence of black spots that are approximately 1 millimeter (.04 inch) in diameter. These spots are found mostly close to the body on the pectoral fins. They may, however, also be seen on all other fins, and, in major infestations, even on the body. Since our own adult Lake Nyasa cichlids are all imported, some of them do have some of these black spots. However, we see no increase in the number of spots on an individual fish nor any indication of the spots spreading to any of the uninfected fish. We believe that this is a parasite, but, to date, we have not had time to take samples for microscopic examination nor have we made an effort to give specific treatment to eliminate these spots. This latter fact is due to our observation that if not widespread, these parasites do not appear to debilitate a fish or to cause it discomfort. Of course, we have no idea as to the effect of these parasites upon a fish with a widespread infestation since we have only observed such cases in cichlids which belonged to others, and the fish were not under our continuous observation or control. We intend, in the future, to make full examination of these spots to determine the type of parasite present and the specific treatment against it. Young Nyasa cichlids which have been tank bred show no signs of these black spots at all.

About 2 months after we got them, we noticed that two of our *juelleborni* were showing all the signs of being ready to spawn. One male's coloring had obviously altered, and so had that of the largest of our females, who was

visibly swollen with eggs. The male incessantly chased this female, and, upon overtaking her, he would vibrate his body and tail before her. They swam together as a pair, attacking any other *juelleborni* that appeared in their immediate vicinity. At intervals the female would stand still, permitting the male to display himself to her, and at these times she seemed to lie on her side at about a 45° angle, with her underside toward the male. We did not observe any of the mouth locking which is so common among other cichlids. (Is this possibly due to the underslung position of the fish's mouths?) All five *juelleborni* were still in the tank, and none were removed, nor were the scavengers disturbed. About 2 or 3 weeks later, while feeding the fish, we were shocked to see that the *juelleborni* had spawned; three of the fry were visible in the tank. We cannot state that prior to this we observed any female carrying eggs or fry in her mouth. This, of course, is not any indication that this might not have been the case. Nor had we noticed any of the five *juelleborni* refusing to eat. Under these circumstances, we cannot state with any certainty that *juelleborni* are or are not mouth-breeders. We feel fairly sure that the omission of eating by any one *juelleborni* would have been seen by at least one of us, but, again, we cannot state this as a fact. Since, at the time of writing this article, another breeding has begun, we shall make closer observations and try to determine these facts accurately.

When first seen, the *juelleborni* fry were about $\frac{1}{4}$ inch in length, very well formed, and had erect dorsal fins. They were quick in motion, and extremely fast swimming. Closer observation disclosed a total of six young *juelleborni* in the tank. (More may have hatched, but we have no way of being sure.) Three were a rather dark blue, and three were blue-white in color. We immediately removed all five adult *juelleborni* from the tank but did not disturb the scavengers. The six fry were permitted to occupy the 55-gallon tank for about a week, but this was a rather discomforting situation, since we did not have this much tank space to spare. Therefore, at the end of the week, we removed all six fry to a 15-gallon tank. The 15-gallon tank was bare, and was filled with water siphoned from the 55-gallon tank. The light of this tank is on the same timer as the parents' tank (14 hours on per day), and the temperature was adjusted to conform exactly to the parents' tank (80° F.). No filter at all was used, but an airstone at low output was employed. One corydoras and a few snails were placed in the tank. This move, although far from easy, did not seem to upset the fry, and they adjusted readily to the new tank.

The youngsters are fed three times a day on live baby brine shrimp, frozen baby brine shrimp, scraped beef heart, finely chopped halibut, and dry food which is crumbled in our fingers. Like their parents, they are ravenous eaters, and they refuse nothing. They will attempt to eat pieces which are almost as large as those consumed by adult *juelleborni*, and since

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they are unable to consume them whole, they will tear and pull at them. Their rate of growth is extremely rapid.

For those who are interested, the accompanying illustrations credited to Stanley H. Lieberman were all taken with a Nikon Photomic T camera, with an F 3.5 Nikor Macro Lens capable of focusing (from infinity) to 4 inches from the object. At a focal distance of 4 inches, a 1 to 1 (lifesize) image is obtained on the transparency. The film used was Ektachrome X. The light source was a 200 watt-second AC operated photoflash. The tanks were lit at a 45° angle to prevent any light reflection and flare in the lens. To obtain sufficient depth of focus at the closer distances, the various shots were taken at lens openings of F-22 to F-45. We might mention that the flashes of intense light did not seem to upset or annoy the fish at all, and they remained quite oblivious to our activities.

LATE ADDITION

Since writing our original article on the care and breeding of *Labotropheus fuelleborni*, we have bred these fish many times and with great regularity. It is apparent that once the tank conditions are adjusted to their liking and an initial breeding has been achieved, further breeding is not only easy to achieve but virtually impossible to stop, short of complete separation of the sexes. At this writing, we have approximately 160 young *fuelleborni* ranging in size from 1 inch to over 4 inches. All the fish are in excellent health. All spawnings were achieved under the conditions described in our article.

We have been able to make observations which were not possible during and immediately following the first breeding we achieved. *Fuelleborni* are, as was expected, definitely mouth breeders. A female carrying eggs or fry in her mouth tends to retreat to a quiet, protected part of the tank. She seldom ventures forth during this period, and, therefore, she is not easily observed. However, there is the advantage that you can always tell when a female is carrying eggs by the fact that she refuses to come out at feeding time. Once you know that a female is carrying eggs, her progress can be observed by the swelling of her mouth and the area immediately surrounding her mouth . . . particularly her underjaw, which assumes quite large proportions.

A full-grown and well nourished *fuelleborni* female will give you 20 to 30 fry; the younger the female, the smaller the number. The least number of fry we ever got was six.

The female will hold the eggs and, later, the fry in her mouth for about 26 days. During this period, as stated above, she accepts no food whatsoever, nor does she open her mouth to any extent. When the fry are about 6 mm in size, she releases them for short periods of time. However, she remains close by, scooping them up at the first sign of danger. This procedure is followed for about 7 days. After this time, the fry become adventuresome, and, in

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swimming further and further from the mother, they find small nooks and crannies in the rocks. These spaces are quite tiny, far too small to permit the entry of any but the smallest of fry. The fry then stay in these "fortifications" from which they dart forth for a few moments when the coast is clear.

It is extremely difficult to capture the fry at this time should you wish (or be forced) to move them to a different tank. When one such capture was necessary in our case, we found that we had to tear down the entire tank. Since, as we all know, tearing down a large tank is neither easy nor quick, we suggest that you make every effort to breed a pair in a tank which can be devoted only to them and their offspring for 6 to 8 weeks. The parent *fuelleborni* are no danger to the fry, and do not attempt to eat them. As the fry grow, they leave their rocky hiding places for longer and longer periods of time, and when they are approximately 15 mm in size (about 8 weeks old), they are as bold as are their parents.

Being kept in groups of five or six adults with a few scavengers does not seem to inhibit the spawning of *fuelleborni* at all. We doubt that segregation of a pair would produce more breedings in any given time period. We do, however, wish to point out that all our tanks are generous in size (none being smaller than 55 gallons in capacity), and all are well provided with caves formed from piled rocks. We, therefore, cannot generalize about fish kept in smaller quarters or in comparatively bare tanks. It is interesting to note that on one occasion a single male fertilized two females within the same tank on the same day. The fish are, therefore, most certainly not monogamous. Both females carried a full brood and went through the successive stages of incubation, fry release, etc. within a day of each other.

It has been our experience that all of the Lake Nyasa cichlids are extremely tolerant of very young fry. No attempt is made to eat or even approach them threateningly. We have permitted the parents to remain in the tank with the young until the fry reached so large a size that it would have been a physical impossibility for the adults to eat them. We accidentally had four young *fuelleborni* escape through a partition in a 100-gallon tank. They lived with a group of *Pseudotropheus fuscus*, which are extremely vicious toward each other—(1 large male had killed off four other adult *fuscus* in rapid succession immediately prior to this "jail break" by our young *fuelleborni*). None of the *P. fuscus* paid any attention at all to the youngsters, and, at this writing, they are still living peacefully with the *fuscus*, including the large vicious male!

The coloration of young *fuelleborni* varies considerably from fish to fish. As stated in our original article, the first batch of young contained fish of dark blue and fish of a blue-white. We have found in successive spawnings

Continued on Page 92



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MAIL CALL

By Mike Reed

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Fungused eggs

Q. In the 1787 book on cichlids, it is stated that parent cichlids do not eat infertile eggs, but rather these eggs are destroyed when the parents mouth all eggs and the infertile ones burst. However, these are my observations of a pair of *Cichlasoma nigrofasciatum*: I purchased a mated pair of these fish from my dealer after having seen them spawn previously. The fish quickly adjusted to my 20-gallon tank and spawned within a week. There were about 200 eggs. After a day, I noticed about 30 white eggs. The next day there were only 10. I watched closely and saw the female eating some eggs, and then I noticed only 7 white eggs and some empty spaces where the other white eggs had been. At no time did the female mouth the other eggs or eat any of them. I can only conclude that the white eggs were picked off and eaten. I do not believe that the fish are smart enough to know that eating these eggs will prevent the

others from getting fungused, but I do know that instinct tells them to destroy abnormal eggs merely because they are not like the others. I would appreciate your comments on this.

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foods and products for New Zealand fish foods and non-fish things like stamps, magazines, postcards, etc. Living in New Zealand has disadvantages for a hobbyist, as few new types of food and no freeze-dried food can be obtained. Also, import restrictions now allow only a few fishes into the country.

In spite of the difficulties, I think our hobby is great fun and very interesting. Christopher Wood, "Pioneer Farm", No. 2, R.D., Manurewa, Auckland, New Zealand

A. I have printed your entire address so that anyone may write to you who wishes to do so. The import restrictions in Australia and New Zealand are a constant source of trouble to the tropical fish hobbyist, and I must admire anyone who enjoys this hobby enough to pursue it when faced with these problems. Best of luck

in the future with your hobby, and I hope you get many answers to your letters.

Breeding black ruby barbs

Q. 1. Some time soon I would like to breed some black ruby barbs. Could you tell me what the proper temperature and pH of the breeding tank would be?

2. What size tank should I use? Is a 5- or 10-gallon tank enough?

3. How should I get the female to develop eggs?

4. What should the tank bottom be like?

Mary Lou Poder,
Johans town, Pa.

A. 1. Start them off at about 76° F., and gradually raise the temperature to about 80° F. The proper pH is about neutral.

2. The 10-gallon tank will be fine.

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3. Your best bet is to isolate her for about a week, feeding her the best foods available. With all this good eating and no driving from any males, she'll develop plenty of eggs!

4. The tank bottom need not be set up in any special way. I like to spawn this species using a lot of tall bushy plants (such as cabomba) in one half of the tank and leaving the other half bare.

Angry reader

Q. A few months ago I sent you a letter telling you about an albino discus that I had raised. It is now full grown, and I tried spawning it with a normal discus. So far my attempts at getting more albinos have been futile. I would like to know why you completely ignored me and my last letter! I was quite angry after taking time out to write you about my discovery. Is this the type of interest you have in a reader of your magazine? Is this the service you offer to a person who might start a subscription to a magazine like yours? I hope not, but it seems apparent that you are very rude! I, a faithful follower of your magazine from my neighbor's copies, had a problem that I brought to you, and you ignored me... don't deny it! You show

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to ignore you or be rude. We state clearly at the beginning of this column that we cannot possibly answer all the mail that we get. It would take a man all day every day to answer all the questions that we get

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a gross amount of idiocy and stupidity! Why don't you believe that an albino discus does exist? Is this beyond your faculties? I waited patiently for nearly 6 months for an answer to my question about this fish. My dealer will verify that such a fish does exist.

What I'm really after is to find another person with an albino discus. If I could do this, perhaps we could get together and produce a pure strain of albino discus which would breed true.

Mrs. Agnes F. Miske,
 Linden, N.J.

A. My dear Mrs. Miske, nobody meant

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here. Such a man would have to be qualified to answer their questions, and the time of man like that is more profitably used in producing material for all our readers rather than for just one. It is remarkable how few people complain to us because their letters are not answered. I think this stems from the fact that tropical fish hobbyists, on the whole, are a pretty understanding bunch. I'm sure that you too now understand the situation, and I hope we're friends once again.

I certainly do believe that you have an albino discus. Anyone reading this account who also has an albino discus can contact Mrs. Miske at 165 Clinton St. in the city listed above.

Crossbred guppies
 Q. 1. A friend of mine (a fish hobbyist)

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(st) told me that a pregnant guppy had babies of her own breed and was fertilized immediately afterwards by a male guppy of a different breed that the next batch of young the female would have would be crossed between the male and female. Is this true?
 2. In T.F.H. publication PLATIES AND MOONS, it is said that breeding brothers and sisters of platies (and I take it for granted almost all livebearing

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fish) is not advisable for this causes deterioration of the species. I have done this (breeding brothers and sisters) with my platies and have the fifth generation now, and the fish are perfectly healthy. Could it be that the book is wrong?

3. It is said that fish need plenty of room to grow in. My cousin raised a brood of 35 marble mollies (losing only six) in a 5-gallon tank to full maturity in about 5 months. The tank was thickly planted with algae growth. He fed them very little for the mollies at the algae most of the time. Do you think that the algae had something to do with it? Is this a good method for getting the fry to grow quickly?

William D. Kazilas,
 Amsterdam, N.Y.

A. 1. Could be, but there's a great big

"if" attached. A female guppy can have as many as eight broods of young from a single insemination. If she has had all of

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the young from her first insemination and is ready with a new batch of eggs and you pick this moment to mate her with a desirable male, the two strains will cross. Look at it this way, though: a female that has had six to eight batches of young is a fairly tired, old proposition, if indeed she lives that long.

2. Breeding brothers to sisters gives fairly good results for a while, if the strain you are working with is strong and healthy, but if the strain is faulty you can run into a lot of trouble.

3. The secret of growing good mollies is giving them a good amount of vegetable substances in their diet. Here you see how a hobbyist did everything wrong but one thing right and got the amazing results you describe. Yes, young livebearers do very well if given an ample amount of algae to nibble on at all times. This is not a recommendation, however, to raise 35

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mollies to maturity in a tank only 5 gallons in size.

Plants
 Q. I have been keeping and breeding tropical fish for several years and have read TFH regularly ever since I started in the hobby. One phase of the hobby that has me and some of my friends stumped is plants. Your magazine keeps printing articles on fishes and never seems to cover plants thoroughly. What I want to know is the best pH, hardness, type of light, wattage of bulb, length of time light is left on, and distance of light to sand, for plants.

Donald Strawser, Enola, Pa.
 A. There is no one answer to cover all plants so 6 months ago, your questions would have taken me several weeks of time consuming study to answer. Now, you or I can find out just about anything we want to know about plants from the new book entitled ENCYCLOPEDIA OF WATER PLANTS.

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Guppy Corner



By Paul Hahnel

Black tails

Q. A friend of mine breeds fancy-tail guppies. I was given two females by this person, and they have given birth twice since, mothers and children doing fine. But I have one question concerning the mothers. I'm baffled and can find no answer in the many books I've read. The mothers' tails change colors; their tails get black. Other than this they look like any other guppy. I've noticed that their tails turn black just before giving birth, and now for the past week their tails turn black toward the end of day for about an hour or two. Please, if you can, tell me why! Are they sick?

Johanna M. Brizzi,
Bronx, N.Y.

A. It seems to me you do not have anything to worry about if there is nothing else wrong. Not only females, but males as

well undergo these color changes, the males very quickly. I have seen what you describe happening mostly in guppies with self-colored tails.

Limited space

Q. I am limited in space to two 10-gallon tanks in which I raise fry and a 5-gallon tank in which I keep my breeders. I use one of the large tanks for males and one for females. I feed the growing fry frozen baby brine shrimp and fine dry food. As they grow, they are fed a mixture of eight dry foods and frozen shrimp and daphnia. I use no

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A. These fish are known scrappers, but only among their own kind. Aside from a few torn fins, no damage occurs. Unless you are trying to get these fish to breed for you, I would separate them.

Q. We have a sea anemone in our salt-water tank and would like the following information:

1. Aside from some brine shrimp which gets caught in its tentacles, the anemone we have does not eat. We have tried giving it a dead goldfish, but it was not eaten. Can you suggest some food that the anemone will accept?

2. Can you explain how the clownfish (*Amphiprion percula*) can live in the tentacles of the anemone and not be killed by its sting. I have read that anemones have stinging cells that are capable of killing small fishes?

Unsigned

A. 1. Sea anemones will accept small pieces of uncooked shrimp. These chunks of shrimp should be about 1/4 inch in size and should be dropped directly into the center of the tentacles.

2. In a study carried out at Marineland of the Pacific, in 1959, it was found that the mucus secreted by clownfishes prevents the anemone from discharging its lethal stinging cells, or nematocytes.

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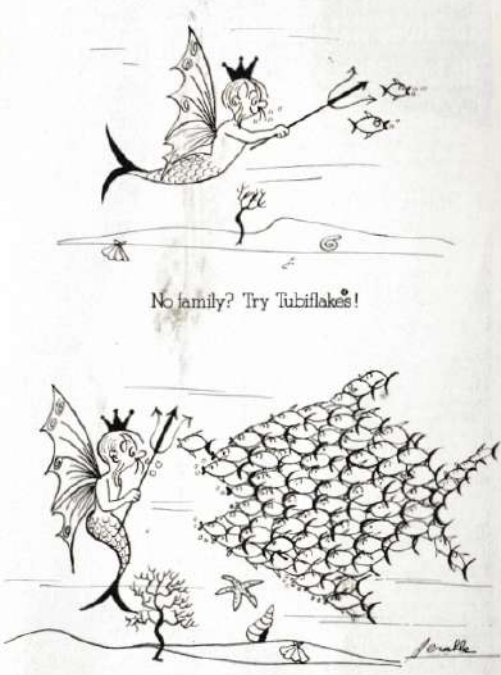
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melanism

Melanism in fishes is the development of unusual black or nearly-black coloration. Black coloration comes from melanin-bearing cells, which are called melanophores. Melanin is the black pigment.

In some fishes black coloration is normal either on parts of the fish or over the entire fish. In such cases you need not worry about the black coloration. Fishes that show excessive pigmentation in areas which are not normally dark, however, should be watched carefully. The black color may appear as spots, splotches, or large areas covering in excess of nine tenths of the affected individual. All too often the appearance of melanistic areas signals that the fish will soon develop extremely malignant (cancerous) tumors.

This epafine, or Cobby, blue gourami shows melanism over the entire rear half of its body. Photo by Rudolf Zukal.



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Four spot tetra	4.06	1.76	44	2.84	70	2.27	56
Harlequin rasbora	2.80	0.50	18	1.18	42	0.81	29
Red parrot	4.96	2.46	50	4.06	82	3.17	64
Swordtail	6.40	1.36	20	2.79	45	2.58	38
Average values:	4.19	1.57	37	2.41	57	2.16	51



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Melanism is particularly common in mollies, swordtails, and platies. I remember once crossing a blood red swordtail male with a black-spotted, red platy female. I got about 40 fry and began to watch day after day for the development of color. Red color began to develop fairly well after about 8 days. It was when black spots started to appear that trouble began. Within 5 or 6 days after the first black appeared, all the youngsters were dead, some with obvious growths on their bodies, others with no visible growths. Those that did not show growths probably died from internal tumors. At the time, I didn't know what the fish had died of. I was fairly certain that it must be something infectious, for hadn't every one of them died? Of course, cancerous tumors are not infectious, but it was only a few years ago that I learned that crosses like the one I made are particularly likely to produce young with a high frequency of deadly tumors.

Fishes with tumors are very rarely found in nature. This is because animals of any kind that develop debilitating conditions are not able to compete successfully with their healthy brothers. So, fishes which would otherwise develop full-blown tumorous growths usually die long before the growths reach even a fraction of their potential size and seriousness.

In the aquarium, however, one can observe the first signs of the growths and isolate and care for the fish and watch the disease develop. This is a most useful procedure for scientists who are interested in studying such cancerous growths. Affected fishes can often live for unusually long periods of time if they are well cared for. During this time the scientist can observe the tumors in all their stages and test various treatments aimed at eliminating them. However, the hobbyist is interested in curing the disease rather than studying it. Unfortunately, there is no known cure for cancerous tumors. I have heard rumors of people who have successfully cut out such tumors. This would be a tricky operation at best and virtually impossible in any but the largest fishes.

One thing should be stressed before we close on this subject: the appearance of black areas on a fish is not always something to become alarmed about. Black areas may develop around areas where minor bacterial invasions have occurred. They may also appear around scars that are the result of small cuts or abrasions. In addition, dark pigmentation may occur as a result of hormone or nervous-system defects in an individual specimen. The only thing to do should a fish of yours develop a dark area is to wait and see what happens. The chances are quite good that he'll never develop a tumor.

Tropical Fish Hobbyist

Continued from Page 65

that the color will vary from a true brown (like the color of a young discus fish), to dull blue or blue-white, up to a really vibrant, bright blue. Fish from a single spawning, raised in the same tank, and always under identical conditions, will display any of these various colors. The difference in color is not necessarily related to physical size or any other factor which we can determine.

We have one beautiful young male that we deem worthy of special mention, since he is so completely different in coloring from any *fuelleborni*, adult or young, seen by us anywhere. He is, at this time, approximately 3



Above—aquarium set up ideally for *Labeotropheus fuelleborni*. A pair is courting in the center foreground. Right—a pair swimming together. The male is the fish above and in front. Photos by Stanley Lieberman.



Right—a pair in the act of courting. Below—a closeup of a youngster in an aquarium net. The fish is only 6 days old, and it is already taking on the coloration and markings of the adults. Photos by Stanley Lieberman.



inches in length and is a vibrant, bright blue which rivals the blue of any saltwater fish. Most important, he displays an extraordinarily bright red edging along the anterior portion of the dorsal and anal fins and along the outer edge of the tail. (Neither of his parents displayed any of this bright red coloring at any time.) This vivid combination of blue and red is very striking. We intend to raise this particular male to breeding size, and if he keeps this coloring through adulthood, we shall await the birth of his offspring with great anticipation. *Fuelleborni* are attractive fish under any circumstances, but this particular male is truly beautiful. Can you imagine what a tankful of similarly colored fish would look like!