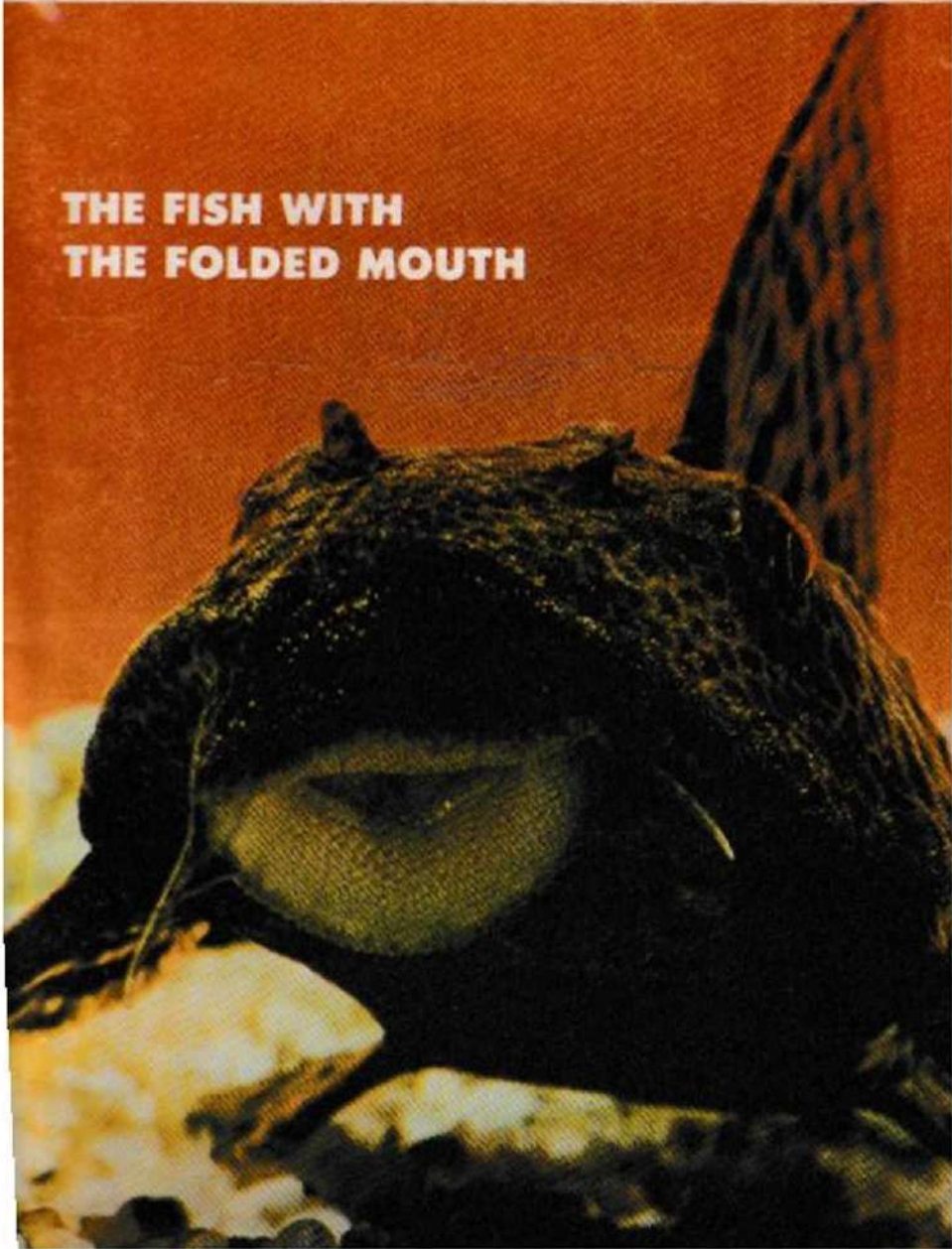


VOL. I NO. 10 SERIES II

AQUARIUM

British Isles 2/6 DOMESTIC 35¢

**THE FISH WITH
THE FOLDED MOUTH**



wardley's **WONDERFUL WORLD OF WATER**



IT IS A Wonderful World of Water to this youngster and to millions of children and adults who are fascinated with aquarium life and concerned with the care and well being of their aquariums. Because they care they feed their tropical and marine fish the best... and the best is Wardley's New Wonderbar Imported Flake Food. Made in West Germany, to Wardley's exacting specifications, New Wonderbar Flake Food contains all of the essential nutrients to give your fish the well balanced diet they need and desire. IT'S EASILY DIGESTIBLE, SO LIGHT IT FLOATS and for the well being of your aquarium, IT WON'T CLOUD AQUARIUM WATER. You'll find Wardley's New Wonderbar Flake Food wherever tropical and marine fish are sold, and in THREE DIFFERENT SIZES... a one ounce canister, two ounce canister and the large eight ounce can. A Wonderbar exclusive—sets of colorful tropical fish stamps are attached to every canister of Wonderbar Imported Flake Food. There are 12 different sets that you can collect and paste in Wardley's Wonderful World of Water Tropical Fish Album. *See after below. In addition, each large eight ounce can of Wonderbar contains a set of colorful measuring spoons that can be utilized for many various aquarium tasks, measured feeding, dispensing of remedies, etc. So see your aquarium dealer, today, and ask for Wardley's New Wonderbar Imported Flake Food. You'll find IT IS A Wonderful World of Water too...

WRITE for NEW WONDERFUL WORLD OF WATER TROPICAL FISH ALBUM Series A1 plus 36 page colorful booklet TFM 74115. Just enclose 25¢ in coin or postage for exact handling. In addition we'll send you free tropical fish stamps to start your collection. Offer good in U.S.A. only!
WARDLEY'S FISH SHOW GREEN
8885 17th Street, Long Island City, N.Y. 11101



AUGUST, 1968
VOL. I NO. 10 SERIES II

THE AQUARIUM

founded in 1932 by Dr. William T. Innes

Contents

THE FISH WITH THE FOLDED MOUTH 4

THINK PINK, CONGO THAT IS 6

POINTERS ON PLANTS 8

AN ELECTRIC FISH NET FOR YOUR AQUARIUM 12

HAPPINESS IS A WET FISH 16

A CHECKLIST FOR FISH SITTING 20

THE WORM TURNS 22

ABOUT OUR AUTHORS 24

THIS IS MY PROBLEM 26

SOCIETIES AT WORK 28

A HISTORY OF THE AQUARIUM HOBBY IN AMERICA 32

AN AMAZONIAN ADVENTURE 34

SOLUTION TO THE AQUARIUM CROSSWORD 64

EDITOR:
Albert J. Klee

MANAGING EDITOR:
John E. Hayes

ASSOCIATE EDITOR:
Helen Simbult

ART & DESIGN:
John E. Hayes
Kenneth M. Goodman

PHOTOGRAPHY EDITOR:
Andrey Roth

SENIOR CONTRIBUTING EDITOR:
Braz Walker

CONTRIBUTING EDITORS:
Jim Kelly
Paul V. Loizelle
Diane Schofield
Richard F. Swinton
William A. Tamey
Arand v.d. Nicwenhuizen
Gerald F. Currier
Cleveland M. Smith
Kappi Sprenger

CONSULTING EDITOR:
Gene Wolfheimer

CONSULTING ICHTHYOLOGISTS:
Robert R. Miller, Ph.D.
Jim Thomerson, Ph.D.

Hermann Meinken
CONSULTING PARASITOLOGISTS:
Sylvan Cohen, M.D.
Robert J. Goldstein, Ph.D.

SALT WATER CONSULTANT:
Robert Stroughan



On The Cover
A head on view of a jovial *Plecostomus* adorns the cover of this month's magazine. (Story on page 4.) Andrey Roth used a motorized Nikon F on Kodachrome film. (Additional credits appear on page 69.)

\$2.50 per year 35¢ per copy

THE AQUARIUM is published by PET BOOKS INCORPORATED (formerly The Aquarium Publishing Company), a division of Merrilrose Corporation. Copyright 1968 by PET BOOKS INCORPORATED. Published at 200 First Court, Farmingdale, N.Y. 11735, 12 times per year.

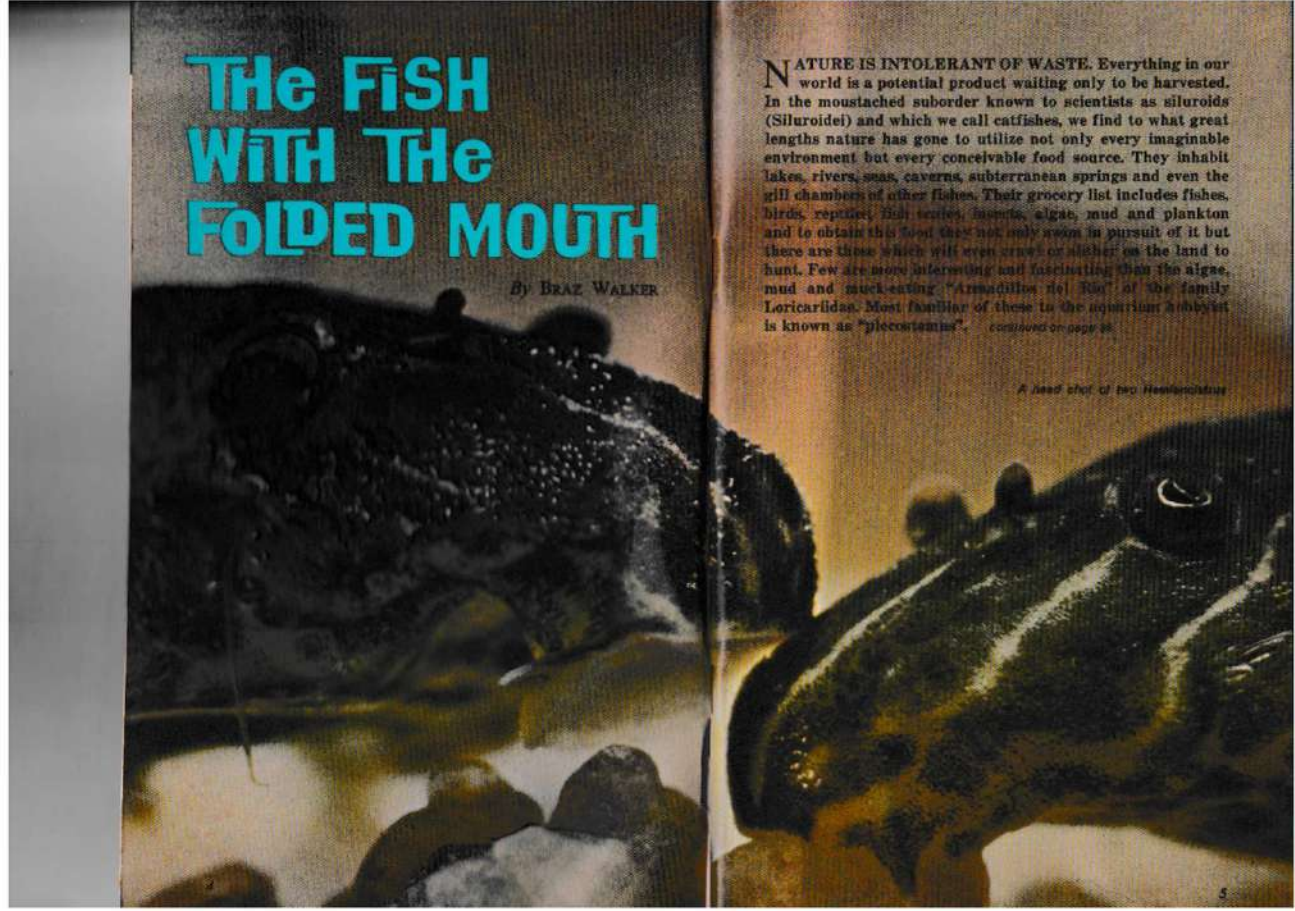
Address all correspondence to PET BOOKS INCORPORATED, 87 Rt. 17, Maywood, N.J. 07407. THE AQUARIUM is not responsible for any unsolicited submissions. To insure return, include self-addressed envelope. Neither contents nor illustrations may be quoted or used without written permission of the publisher. Second class postage paid at Farmingdale, N.Y. Application for additional entry at Hackensack, New Jersey, is pending.

The Fish With The FOLDED MOUTH

By BRAZ WALKER

NATURE IS INTOLERANT OF WASTE. Everything in our world is a potential product waiting only to be harvested. In the moustached suborder known to scientists as siluroidei (Siluroidei) and which we call catfishes, we find to what great lengths nature has gone to utilize not only every imaginable environment but every conceivable food source. They inhabit lakes, rivers, swamps, caverns, subterranean springs and even the gill chambers of other fishes. Their grocery list includes fishes, birds, reptiles, fish scales, insects, algae, mud and plankton and to obtain this food they not only swim in pursuit of it but there are those which will even crawl or slither on the land to hunt. Few are more interesting and fascinating than the algae, mud and muck-eating "Acanthopoma" fish of the family Loricariidae. Most familiar of these to the aquarium hobbyist is known as "plecostomus". *Continued on page 48.*

A head shot of two *Hemibaracus*



THINK PINK, CONGO THAT IS

by ED SYMMES

This unusual photograph of the pink Congo cichlid shows that the pigment of the eye is located in the retina. The left eye appears pink because we are looking at the cornea and the lens which are unpigmented; the right eye (to our right) is black because we are looking into the eye, at the pigmented retina. Using the definition of albino as total lack of melanin, the pink Congo is only a "partial albino."

WHAT TWO-INCH FISH WILL LAY several hundred eggs in a 5-gallon aquarium, and then raise the young with Papa still in the tank? If you are thinking that a cichlid would be a logical candidate because they tend their young, you're right! Most aquarists think of angels and discus as being the aristocrats among cichlids, but there is a new Crown Princess being groomed.

The fish I am referring to is the pink Congo, *Cichlasoma nigrofasciatum*. This is a partial albino of the Congo cichlid. The light-pink body color of both sexes, and the female's brilliant orange-to-red belly region and vertical stripes makes this a beautiful addition to any aquarist's collection.

continued on page 44

A short form with relatively thick and upright foliage, *Sagittaria subulata* forma *pustilla* is one of the best plants for the small aquarium. Popularly, it is known as "needle sag".

PART 1 POINTERS ON PLANTS

By
JERRY CURRIER & MARTY SMITH

THE APPEARANCE OF YOUR AQUARIUM depends largely upon the choice of plants and how you have aquascaped or decorated with them. It would be a mistake, however, to regard plants as only things of decoration, or to believe that we can imitate nature to perfection. An important facet in the care of your aquarium is the understanding of the many effects, the interactions and the constant change to which every living organism is exposed in its natural surroundings. You should attempt in your aquarium to bring the requirements for both the life of your aquatic plants and your fish into balance. In this manner a small living community is formed. It will never be perfect, but its shortcomings can be minimized.

If your plants are to thrive, you must fulfill certain conditions which can be called "growth conditions". First and foremost in growth conditioning is the type and intensity of light upon the plants. With the help of light your plants are able to build organic compounds out of inorganic substances. Plant form is also largely controlled by the illumination available. Today, natural daylight does not play as important a role as it once did in the illumination of your aquarium, primarily because artificial lighting is so widely used.

Artificial lighting should be provided with either tungsten lamps or fluorescent tubes. The use of fluorescent tubes is recommended as they not only use less current and have a longer life, but distribute the light more evenly than do tungsten lamps. In smaller tanks, heat is a problem

with the latter. It is also important to choose the right kind of lamp, that is, the correct color of light. Plants primarily need reddish light, and to a lesser extent blue. Of the fluorescents, the most suitable is the "deluxe warm white" or the "Gro-Lux" types of tubes.

For the majority of aquatic plants, the bottom layer of sand or gravel, called the substrate, is not nearly as important as it is to land plants. Numerous species of floating plants do not need any substrates at all. In other plants, the roots are used mainly for anchorage and they take in little or no nutrient. There are, of course, aquatic plants (mainly "bog" types) that obtain most of their nutrients from the substrate. For the majority, however, aquarium gravel is adequate. The bog types thrive better in a soil mixture which is rich in nutrients. Because of this, it is better to grow these plants in flowerpots. The pots should be filled with a good mixture of sand, loam, turf and peat.

As regards the supply of nutrient, attention must be paid to the various ways in which aquatic plants absorb their nourishment. Plants which absorb nutrients mainly through their root system should have the substrate fertilized, but if they obtain nutrients directly from the water, the fertilizer may be added directly to the aquarium water. Your local dealers will have special formulas that contain all the necessary compounds and trace elements. Your aquarium should never be enriched with too much nutrient. The amounts given must be what the plants can actually use; the instructions must be followed!

The natural waste products or debris can be left lying when it is among dense clumps of plants. A tank well stocked with fish requires very little artificial fertilizer. Of course, your tropical aquarium plants cannot and will not thrive if the temperature is too low for any period of time. Most aquatic plants require a temperature of 71-82°F. An occasional drop of a few degrees will not do the plants any harm provided it is not prolonged.

For a beginner it can be nerve racking as to which plants should be selected for the aquarium. How should the choice be made? First, care should be taken as to the purchase of plants which have similar requirements. Second, consideration should be given as to whether the plants are to be grouped only for appearance, or whether the selection is to be made on a geographical basis, that is, choosing plants which come from the same geographical area as your fish. This is strictly a matter of personal taste. Third, are the requirements of your fish with reference to the plants. Do your fish need plenty of room in which to swim? If so, the vegetation should then be sparsely planted. Do the fish like to hide in plant thickets or under floating plants? These points should be

10

considered before aquascaping your aquarium. A beginner should be content with plants in a lower price range, easily cultivated and fast-growing. The costly rarities are often difficult to keep and it is wise to leave them to the more advanced aquarist.

Before you actually go out and purchase your plants you should have made up in your mind as to how you will arrange them. You should also have some idea as to the types of plants you are planning to buy. We suggest that you arrange your plants in groups, with the exception of single, large specimen plants. Keep in mind when planting that the plants are going to require growing room.

You should not plant so that the view is obscured by tall plants in the foreground. By the same token, unimaginative arrangement of all short plants in front and tall plants in back, looks just as "posed". It is just as unnatural to place one "centerpiece" plant exactly in the middle of your tank. It would look better to plant it slightly to the side. Try to place your plants in a natural, mildly off-balance arrangement, rather than a stiff and formal grouping.

Planting is simple. By placing your plants in a shallow dish of water, you can easily remove all dying or decaying roots, leaves and the like. With the gravel in the aquarium, you are now ready to aquascape. All you have to do now is make a hole in the gravel, place the plant in the hole, press the gravel around the plant and thus continue until all plants have been placed where you want them.

Plants which have a tendency to float upwards may be anchored down with lead strips. Remember, do not plant the roots too deep. (It is not as harmful to plant them too high. With growth, the roots will soon pull them into the substrate.) Plant stems which do not have a root system can merely be pushed into the gravel. Planting in small groups gives the best visual effect with this type of plant. However, it is not a good idea to plant all the stems in one hole, but rather in separate holes in a close grouping. Thus, if decomposition occurs, only one stem will be affected. By covering plants, rocks, gravel, etc. with paper you can now pour in the water to fill the aquarium without disturbing the aquascape.

A perfect arrangement will rarely be achieved in the first planting; adjustments will have to be made from time to time. Avoid too much replanting as most plants will eventually suffer from such treatment and die. Your completed planting will usually need little attention. However, occasional thinning out of dense thickets and the cutting back of fast growing plants will aid in the health, growth and beauty of your plants.

continued on page 75

11

AN ELECTRIC FISH NET FOR YOUR AQUARIUM

by B. F. CHHAPGAR

HOW MANY TEMPER MUST HAVE BEEN frayed in the simple act of catching a fish in the home aquarium? The sequence is normally the same—the aquarist wishes to catch a particular fish in a community tank; the fish hides among rockwork or plants; the wrong fishes come into the net, plants are uprooted, malm is churned up and rockwork disarranged—ultimately, after the aquarist has tried his best not to lose his temper, a very much frightened, and possibly injured, fish is caught. How much nicer it would be if the fish could be persuaded to swim into the net of its own accord. Strange as it may seem, this can actually be done!

Electricity can be used to catch fishes without harming them; the principle is based on the different reactions of a fish to an electric current. Thus, if two wires connected to a direct current are dipped into an aquarium and the current passed into it, there will be, at first, no effect. As the voltage of the current is gradually increased, the fishes will turn their bodies so that they are parallel to the current and their bodies will tremble slightly. If the current is increased still more, the fishes will all swim towards the anode (or positive electrode). This attraction is called galvanotaxis. If the current is further increased, the fishes will get stupefied and turn on their sides or upside down—a behaviour called galvanonarcosis. Some time after the current is switched off, the fishes will recover and swim away, without any harmful effects whatsoever.

If an alternating current is used, the fishes, instead of swimming towards the anode, will become paler and will take up a position at right angles to the direction of the current (called oscillogaxis). Even after the current is switched off, they will not immediately resume their normal swimming position; but will stay for some minutes sideways or upside down before swimming away.

On the other hand, if, rather than continuous direct current we apply a pulsating direct current, the fishes may swim towards either of the two

12

electrodes. In all these cases the largest fishes will be affected first, while the smaller ones will be normal. If the current is increased so as to be able to affect the smaller fishes, the larger fishes will suffer from severe muscular cramps, perhaps even resulting in snapping their backbones and subsequent death. This selectivity of the current can be utilized in removing larger fishes, for example, in a dealer's tank containing fishes of assorted sizes. In a community aquarium, if a smaller fish has to be netted out, the larger fishes which have been affected by the electric current will have to be removed first, and then only the current increased.

Let us now see how we can rig up a device to catch fish in a community aquarium. Let us assume that the aquarium is set up on a wooden stand, so that it is insulated. If it is on a metal stand, or otherwise grounded, care will have to be taken to see that the two electrodes at no time touch the frame of the aquarium. The simplest way to have an electric "net" is to have two wires attached to the ends of what is known as an insulation tester. This is an instrument used on telegraph or telephone lines and is simply a dynamo (like a bicycle dynamo) which can produce alternating current up to 200 volts when its handle is cranked. As the handle is cranked faster, the voltage increases. The two wires can be dipped at opposite ends into the aquarium, and the handle cranked, slowly at first. The speed is gradually increased until sufficient voltage is built up to stupefy the larger fishes. These may be removed to another aquarium and the handle cranked faster until the required fishes are affected.

Naturally, we cannot have very accurate control over the voltage by using the above tester. This can be achieved by tapping the mains (110 volts A.C.) and incorporating a rheostat (variable resistance) in the circuit. The current can then be controlled by moving the sliding contact till the fishes respond.

Table I gives the minimum current values for some of the commoner aquarium fishes which will stun these fishes, using alternate current. The fishes are of the normal adult size. As the stunning depends on the size, and not the species, of the fishes, only fishes ranging from the smallest to the larger ones kept in a community aquarium have been used for the experiment. Thus the same amount of current as would stun a medium-sized zebra danio could also be applicable to, say, a neon tetra or white cloud mountain minnow. Similarly, the strength of current used to stun a serpa tetra would also stupefy a red-eye, lemon or head-and-tail-light tetra.

A selenium rectifier can be incorporated in the circuit if it is desired to have a direct current. (This is also required to step down the 220-volt household current in British and European countries to the more convenient 110 volts.) A circuit diagram for both these is given here. In order to get a more uniform electric field in the water, a copper or zinc sheet is

13

Read to the cathode, while the anode is in the form of a round or rectangular metal frame with insulated (wooden or bakelite) handle, and with mosquito netting or nylon meshing sewn onto it, so that it also serves as a net.

Name of fish	Voltage	Strength of current (in milliamperes)
Kissing gourami	32	150
Oranda goldfish (medium)	35	170
Blue gourami	40	175
Angelfish	55	240
Buenos Aires tetra	65	270
Tiger barb	70	290
Corydoras	78	325
Serpae tetra	80	340
Molly	85	350
Black tetra	96	390
Zebra danio (large)	102	415
Botia lohachata	110	450
Penguin (<i>Thayeria</i>)	120	480
Guppy	160	620

Finally, I have given a circuit diagram for giving a pulse-current, using low voltage (6 or 12 V) batteries. One of the wires goes directly from the battery to the cathode, while the other connects to a vibrator, transformer, diode, thyatron valve, and rheostat. The vibrator converts direct into alternating current, the transformer steps it up to 110 volts, the diode again converts it to direct current, and the thyatron valve switches the current on and off in "pulses". It may be wondered why such a complicated set-up is advocated, when a simple insulation tester could have done as well. For one thing, the current required to stun a fish is very much lower, while the after-effect also lasts for a shorter time, so that there is less likelihood of permanent injury to the fish. Thus, if the after-effect of a pulse current lasts for two minutes, that of a direct current lasts for six minutes, whereas that of alternating current lasts as long as 12 minutes.

A word or two of caution may not be amiss here. At 110 volts, electric current can be quite dangerous if used carelessly. It is advisable to use rubber gloves, and also wear rubber-soled shoes or stand on a dry rubber sheet or wooden plank. The handle of the net-cum-anode should be of wood, and all electric joints should be carefully taped so that water running down the wires may not cause a short circuit. The "net" should not touch the frame of the aquarium if the latter is placed on a metal stand. ●

14

Introducing the Bon Air pump. The "champagne" of aquarium air pumps. Now you know why we're making them in France.

Value!
The French do have a way of creating some of the world's most distinctive things.
Like perfumes.
Fashion.
Champagne.
And, too, a great reputation as pump for tropical fish.
For over 25 years, this compact pump mechanism has provided trouble-free

performance for countless and serious aquarists... and now Manufacture Intérieure Bon Air is American.

A fact that shouldn't come as a surprise to you, because whenever a new product, or new idea is developed, it usually draws ideas from Manufacture Intérieure.

Also, all we didn't get to be Number One without good reasons.

In this instance, we took a fine French mechanism, designed in hand-drawn lines for it, and then put it in a pretty box.

Now, the rest is up to you.

The Bon Air mechanism is dependable.

So dependable that it is guaranteed for life.

It will operate any aquarium filter in the market.

And it will do so efficiently, powerfully, and silently.

In fact, it's so quiet, about all you can hear when it's operating is the sound of the bubbles.

Just like champagne.



METAFRAME

HAPPINESS IS A WET FISH HAPPINESS IS A WET FISH HAPPINESS IS A WET FISH HAPPINESS IS A WET FISH HAPPINESS IS A WET FISH

By JERRY CURRIER AND MARTY SMITH

IN MANY ARTICLES YOU HAVE READ THAT "proper conditioning of fishes is a must for spawning", prompting your asking yourself, "Fine, but just WHAT is 'proper conditioning'?" Oddly enough, there doesn't seem to be any strict rules governing conditioning. Maybe that's why many authors (ourselves included) often skip over the subject. We know what comprises "proper conditioning" in our own fish rooms, but we've seen others using different techniques, achieving the same results, i.e., the successful spawning of their fishes.

Just what is "conditioning"? The word "condition" means, among other things, "a state of health; especially, a favorable or sound state of health". "... sound state of health"—now that makes sense. No one should expect their fishes to be happy if they are not healthy and let's face it, a happy fish is more likely to spawn!

The problem boils down to making your fishes happy. How do you go about it? Well, a number of things can cause a change in your fishes' contentment. The water surrounding them, for example, has a profound effect. Its temperature, chemical make-up, the amount of wastes and impurities it contains, motion or lack of motion, oxygen-to-carbon dioxide ratio, and possibly even the amount of dissolved iron in it, are all contributing factors to the health and therefore "happiness" of your fishes.

Frankly, we feel that too much emphasis is put on certain aspects of aquarium water chemistry by many authorities. We believe in doing as little meddling with pH and DH (degrees of hardness) as possible. (EDITOR'S NOTE: Amen!) Constant "adjusting" of the chemical properties of the water makes it difficult for the fishes to settle down. We firmly believe that the adjusting should be on the part of the fishes and NOT the aquarist. This is not to say, however, that certain aquarists with extreme pH and/or DH problems may not have to adjust their water. Rather, the point is that the adjustments should be made only very infrequently and

16

only when absolutely necessary.

Of prime importance to the health of your fishes is not so much the chemical makeup of the water, as indicated by pH and hardness, but rather the amount of impurities, especially organic (coming from a living organism) wastes. Wastes of this nature often lead to discomfort in your fishes and can have serious side effects, such as a buildup of bacteria which, in turn, deplete the oxygen supply leading to greater discomfort, i.e., "unhappiness" for your fishes. Partial changes of the aquarium water can help reduce the buildup effects of organic wastes.

Another important facet of manufacturing a Utopia for your fishes is their food. It has been said that the way to a man's heart is through his stomach. The same adage can be applied to your fishes. Each fish has specialized feeding habits in its native waters. There is no one standing on the shore of its river, stream or lake to dump in a handful of some "high protein," "low fat", preparation once or twice a day! Fishes, in their natural surroundings, spend most of their time searching for food and eating. In many respects fishes seem to be almost a stomach with scales! As an example there is the mosquito fish, (*Gambusia affinis*), used throughout the world as an important aid to mosquito control because of its largish appetite.

In the aquarium, however, the problem of feeding your fishes CORRECTLY is magnified by many factors. Fortunately the modern aquarist has the advantage of today's technology to aid him. Living foods are relatively available at all times of the year. Due to jet transportation, foods such as live brine shrimp are flown to places far removed from the point of collection. Major developments, based on accurate understanding of the various dietary needs of fishes, have led to well balanced, nutritious foods of a manufactured nature. All of this is fine and dandy, but problems continue to confront the man who keeps fishes. Even the best food is NOT the fishes' natural food. Certain deficiencies still exist.

In an attempt to reduce the impact of these deficiencies, most successful aquarists try to vary the foods they offer their fishes. Along with brine shrimp and a good dry food, the use of daphnia, *Gammarus*, mosquito larvae, house flies, fruit flies, various worms such as earthworms, glass worms, tubifex worms and white worms and a host of other insect forms have been used to make up a "well balanced diet". The combined nutritional values of these foods helps approach the nutritional needs supplied by the fish's natural foods.

It is not entirely clear why living foods are so important to the health of fishes. Whether the effects are psychological or physiological has not been determined. With some of the newer prepared diets, fishes can do quite well. However, nothing really seems to replace living foods. Green foods of a vegetable type should not be overlooked, as many fishes dine on algae or plants. For example, when conditioning certain aquatic

17

snails, you'll find that foxtail spinach is ideal. You might also be surprised at how many of the fishes will eat spinach. Although the live-bearing fishes, especially *Mollisina* species, have long been known for their love of vegetable matter, we have found that many of the egg-layers also eat it and that occasional feedings promote better health.

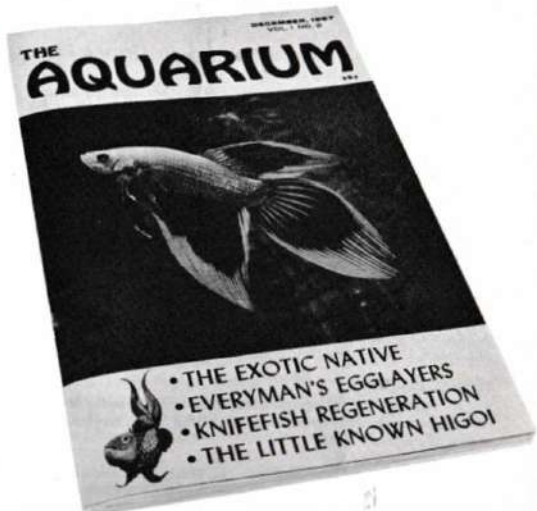
Some authorities recommend the use of various meats, especially with larger cichlids. Meats such as lean beef in various forms are usually fed by freezing them, then using a kitchen grater to reduce them to bits that can be eaten by the fishes. Various seafoods, such as shrimp or scallops may also be used in this manner. The new "freeze-dried" foods, tubifex worms and brine shrimp, are supposed to supply the same nutritional values as the living forms, but until we can make a more extensive study with them we will reserve comment. By this time you should have gotten the idea that feeding is an important part of "conditioning"!

Another aspect often overlooked is the problem of "crowding". While many fishes will tolerate, and some will even thrive in an overcrowded aquarium, many will not. This is especially true with the more shy or timid fishes. Serious and even fatal disorders can result from overcrowding. These may be in part physiological but the psychology of the situation seems to be a very big factor. We have even seen fishes refuse to eat in an overcrowded situation. A "pecking order", i.e., sequence of dominance, is generally found in any established aquarium. When the aquarium is overcrowded the fishes on the lower end of the ladder cannot evade those further up, as easily. This leads to constant harassment and generally a much shortened life. Most living creatures need to have periods of rest. In an overcrowded aquarium, undisturbed resting places are few and far between. The obvious physical health problems are tremendously magnified in an overcrowded situation. These have adequately been covered in standard reference works and we will not rehash them here. Suffice it to say that overcrowding should be avoided in any "conditioning" program.

The last and probably most important phase of "conditioning" is YOU! We have seen many amateur aquarists practice what could be a successful program, but due to lack of experience and/or patience the program would fail. The only real way to learn about your fishes requirements in your own situation is through experience. No book or article or "expert" can be totally accurate concerning what is best for YOUR fishes. Fishes are living creatures and as such different situations warrant different solutions as all living things react to life in a varied manner. Experience through experimentation is the only reliable answer. This is one of the truly fascinating aspects of our hobby; the problem of learning to make our fishes happy in our own way and with methods we have devised ourselves. ●

18

This is the new **AQUARIUM**
The world's standard
monthly magazine for beginners
and experts.



THE AQUARIUM
87 ROUTE 17, MAYWOOD, NEW JERSEY 07607

- 1 YEAR (12 ISSUES)\$3.50
 2 YEARS (24 ISSUES)\$6.50
 3 YEARS (36 ISSUES)\$9.00

NAME _____

ADDRESS _____

A CHECKLIST FOR FISH SITTING

By GEORGE PETTY

TO THE AQUARIST:

1. Have all food, medicine, and miscellaneous items such as fish nets, bubblers, aged water, and emergency tanks in plain view by the aquarium.
2. Make certain that the uses and dosages of all remedies are plainly marked on the bottles themselves.
3. Consider how much light you want the tank to receive. If daylight alone is not enough, install an electric timer for control of the artificial lights.
4. Provide floating, bushy plants for shelter for any fry that might be produced during your absence. If you have a "sure" female, and she is not greatly swollen, take her to an experienced aquarist, either a friend or a dealer. Fry need experienced attention and frequent feeding.

TO THE VOLUNTEER:

1. Always study the aquarium for a half-minute or so for dead fish (which must immediately be removed) or sick fish (which may have to be treated in a separate tank).
2. If you visit the tank once each day, slowly tap out enough food so that the fish dispose of it almost as quickly as you can dispense it, up to ten minutes. If you visit once every two days, follow the same procedure for fifteen minutes. Once every three days, do this for twenty minutes. For once every four days and less frequently, also add prime foods such as tiny bits of raw beef or raw fish.
3. Never "dump in" what you think is ten, fifteen, or twenty minutes of food, since some of it will become soggy and either be sucked into the filters or else will fall to the bottom where it will decay and cloud the water.

20

4. As for symptoms of disease, look for the following signs: (a) distinct paleness, loss of color; (b) sluggishness, no interest in eating, clamped fins; (c) white spots, white slime; (d) eruptions, blotchy red areas; (e) abnormally enlarged "popeyes"; and (f) difficulty in swimming, swimming head-over-tail or side-over-side.

5. As for treating the disease, look for the worst, most obvious symptoms—first things first. Then, check the medicine bottles. Often they describe the symptoms very well so as to eliminate any doubt, as well as providing their cure. If only a few fish are ill, isolate them in a separate container. Perhaps you could take these casualties home with you where you could more carefully supervise their recovery. For illnesses *a* and *b*, check immediately for other signs, such as white slime or white spots. If they are lacking, you have a relatively easy "case" on your hands. Try to feed *all* of the fish more often, somewhat decreasing the length of the feeding per visit. Vary their diet, offer them small pieces of thoroughly cleaned raw lettuce. Tiny bits of beef liver along with the regular foods will help. Substitute some aged or, if possible, rain water for some of the tank water.

6. Diseases *c* and *d* can be considered to be external diseases, that is, the fish are being attacked by small parasites (non-harmful to humans). If there are on hand specific remedies, use them immediately. Elevate the temperature of the aquarium *slowly*. Once a mark of a little over 80° has been attained, the parasites will leave the fish and become free-swimming, and thus more prone to the medicine. Disconnect the filters and use a few bubblers to keep the medicine circulating. If there are no commercial remedies at hand, add one teaspoonful of *noniodized* table salt per gallon. Be sure to raise the temperature. At the end of three days, siphon out about half the water from the bottom and replace with three-day-old tap water. If further treatment seems necessary, wait a day until adding the second dosage of salt, this time adding only half the original amount.

7. In the instances of the last two diseases, remove the affected fishes immediately. Check very carefully for dead fish and snails. Again, try the warm salt-water treatment. Whenever transferring fish, use water from the old aquarium. In no case should fish experience a sudden change of temperature or type of water. For disease *f*, place the fish in shallow water and do not use a bubbler since this will jostle the helpless fish about.

8. Always replace the aquarium cover right after you have finished feeding or removing fish.

9. Never add new fish or plants in the owner's absence. ●

21

THE WORMI TURNS

By HARRIET CONNELLY



WHEN DOG BITES MAN OR WHEN FISH GRABS MAN, these incidents are not usually considered news. Let the situations reverse themselves, however, and they become ammunition for the humorous-events sections of our daily newspapers. A recent experience in the "worm-grabs-fish" category, although interesting, did not appear very humorous, at least to the fish concerned. Some time ago, a local dealer in tropical fishes received a shipment of zebra danios that appeared to be all females. The body of each fish was very plump, indicative of the female sex in this species. However, the contours of the belly line seemed to be extremely lumpy, as if the fish had swallowed some odd-shaped object such as a child's playing jack (see Figure 1). In addition, the danios forever seemed to be hungry. At this point, it was decided to dissect one of the fish.

After being anesthetized, the fish was laid out on paper where it could be examined closely (see Figure 2). The lumps were clearly seen in this position. A preliminary incision of the ventral area produced a sudden protuberance of the entrails (see Figure 3). At this point, it was confirmed that the fish were infested with some kind of worm (see Figure 4). The worm proved to be a roundworm, the total length of which turned out to be much longer than the fish itself (see Figure 5). Additional specimens were dissected and all contained roundworms, some reaching a length of 5 inches.

Since roundworms are uncommon aquarium-fish parasites, the infestation of several hundred of the zebra danios was surprising. Roundworms infest fishes in a variety of ways but this particular species was found only in the intestines of the fish. No attempt was made to identify the particular species of roundworm as this is a matter best left to specialists. Dr. H. H. Reichenbach-Klinke discusses but one genus of roundworm in his book, viz. *Capillaria*, but these are very small roundworms often referred to popularly as "hairworms". A shorter discussion but covering more genera can be found in Van Duijn. This author refers to one roundworm, *Ichthyonema*, as being characterized by its red color

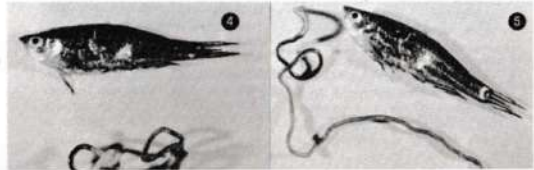
22

and being found in the belly region of the host fish. Probably the best review of nematode ("roundworm") infestations of aquarium fishes can be found in Amlacher, but even his account leaves much to be desired. (The Reichenbach-Klinke and Amlacher books are in German, the Van Duijn book is in English.)

The damage done to fishes by roundworms varies with the size of the worm and its particular life cycle. Some roundworms develop as larvae within the body of the host fish, and subsequently form cysts. The cysts may cause trouble internally. Other worms may, as in this case, live as adults within the host. If the worm leaves the fish by boring through tissue and organs, much harm can be done by the wounds so made. Since an intermediate host is usually involved, roundworm infestation is not a prevalent aquarium malady. However, fishes become infested by eating live foods contaminated with worm larvae, or by eating fishes already infested with worms or larvae.

Upon inquiry, it was discovered that the zebra danios in question originated from a Florida hatchery where they were kept in outdoor pools. It seems certain that they became infested through their live food supply, either blood or tubifex (*Limnodrilus*) worms, or one of the numerous small crustaceans that abound in Florida waters. In spite of the large size of the roundworms, the danios continued in apparent good health for over 8 months. During this time they were active, especially during meal times. Since there was no danger of transmitting the worms from one fish to another, owing to the absence of the next host in the life cycle of the parasite, the danios were kept in a community aquarium. Since, also, no cure is known for such a condition, no treatments were attempted. After 8 months, the fish started to die off. Among other things, the large size of the worms had blocked the intestines and made food unavailable to the fish.

Other aquarium fishes have been reported to have contained roundworms, including angelfish, several Brazilian species of cichlids and characins, imports of the neon tetra (*Hyphessobrycon innesi*) from Peru, some *Corydoras* species, and the electric catfish, *Malapterurus electricus*. We can now add *Brachydanio rerio* and, undoubtedly, additional species will be unlucky enough to be included in this list in the future. ●



ABOUT OUR AUTHORS



JAMES BRAZELTON WALKER

While attending Texas University in 1952, Braz Walker became paralyzed with polio at the age of 28. After returning to his home in Waco, his longtime interest in aquarium fishes was intensified, particularly with regard to catfishes, cichlids and those rare or unusual fishes infrequently discussed in the hobby. His distinguished writing career started in 1955 and since then, he has contributed to three national magazines as well as conducted a regular newspaper column concerning the aquarium hobby and aquatic life in general. Because of his complete paralysis from the neck down, special methods for adapting photographic equipment had to be devised, including a shutter release activated by a rubber bulb in the mouth. During a visit to Braz's home, he demonstrated how he types his letters and manuscripts, i.e., with a lever held in his mouth that he must position in a specific part of a cradle for each and every letter that must be typed. In September 1957 he was selected as the Southern Pharmaceutical Journal's *Man of the Month*, and in

1964 was named *Outstanding Self-Employed Handicapped Worker of the Year*. His latest award was from the Waco Jaycees, i.e., their *Distinguished Service Award*, in January of this year.

Braz's accomplishments in the aquarium hobby would be remarkable for a man not so stricken, much less for one who has suffered from all three types of polio, affecting his lungs, nerves and muscles, as he has. He has held the position of Senior Associate Editor of *Aquarium Illustrated* and presently is Senior Contributing Editor of *The Aquarium*. His photographs, both color and black and white, have appeared in magazines and books. A good number of his articles and photographs are currently appearing in the British aquarium literature as well as our own. He is an aquarium pioneer in studying both the electricity and sound production of fishes, and has experimented with sundry electronic equipment that he has adapted to aquarium use in this regard. As Earl Braeken, Jr., City Attorney of Waco puts it: "Braz, along with the above mentioned activities, participates regularly in the sacraments as a member of St. Paul's Episcopal Church and through this association has always accepted life and its beauty and with this faith has developed a philosophy and outlook that in a few short words reflects his outlook on life. His philosophy is that his handicap is not a disability but an opportunity to use God-given talents and imagination to their fullest and through this belief he lives it by actively cooperating with other groups in

continued on page 64

24

THIS IS "ATLANTIS" ... OUR NEWEST 3-D BACKGROUND.

As with our six other colorful styles, "Atlantis" is available in sizes to accommodate most aquariums from 5 to 29 gallons. In addition, the "Rocks & Caves" style is manufactured in 36 and 48 inch sizes.



AT - "ATLANTIS"

If you can't make up your mind... buy six more tanks!



A - "AQUALANA"



R - "ROCKS & CAVES"



S - "SHIPWRECK"



D - "DIVER"



T - "TREASURE CHEST"



O - "ORIENTAL"

AVAILABLE AT QUALITY PET OUTLETS EVERYWHERE.

©1967 PENN-PLAX PLASTICS, INC., 1901 to 1909 FOSTER AVENUE BROOKLYN, NEW YORK



25



THIS IS MY PROBLEM

by HELEN SIMKATIS

From: Ron Sokolik, Warren, Michigan.

I have fallen in love with the colorful freshwater puffers. Could you list and describe some of the more attractive species and tell where they are found, describe their food and water requirements, and relate their breeding habits and necessities, if indeed they have been bred in captivity?

Answer: As you probably know a great deal could be written on the freshwater puffers as they are a fascinating subject. Perhaps *Tetraodon lineatus* is the species that shows up most frequently in home aquariums. It is imported from India, Ceylon, Burma, Thailand, Malay Peninsula, Sunda Islands, and the Philippines, where it is found in fresh and slightly brackish waters. This fish is not fussy about water although it seems to appreciate some aquarium salt (about a teaspoonful to three gallons of water). They will eat snails, tubifex, brine shrimp, and require some green vegetable in their diet. If an algal growth has formed on the sides and back glass, let it remain to fulfill this need. Small pieces of lettuce or spinach should be supplied if such a growth is not present. In that they are apt to be aggressive with other fish, a tank to themselves is indicated, although the American

northern puffer does not have this characteristic. Sex distinction cannot easily be made but *Tetraodon lineatus*, as well as other species, has been in captivity. The pair go through a courtship on the floor of the aquarium and if more than one male is present, two will attach themselves by their teeth to the underside of the female. The eggs are laid on the aquarium floor and are fertilized by the male who takes care of them by hovering over them and guarding them. It takes over a week for the eggs to hatch and after the egg sac disappears, infusoria and newly hatched brine shrimp should be offered to the tadpole-like young. This is not the only puffer that has been used as an aquarium fish, however. Others that could be mentioned include *Tetraodon miba*, *T. palembangensis*, *T. schoutedeni*, *T. cutcutia*, *T. minus*, and *Colomesus pituitaca*. Indeed, the last-named is very often seen in aquarium shops nowadays. The species mentioned all differ in one or more respects, and it is not possible here to summarize them in detail.

From: David Stein, Freeport, New York.

Will you answer the following questions regarding guppies?

Question: What size tank should be continued on page 63

YOUR CHOICE!

Only **Supreme** MAKES A QUALITY AQUARIUM POWER FILTER FOR EVERY TANK...EVERY NEED!

5 MODELS!
Presented
Biggest selection of quality filters from any one maker:

Two Sizes in Salt Water Tanks!

Supreme SEAMASTER

Does everything... the only aquarium filter made with all-plastic pump and filter... no metal to corrode and poison salt water tanks. Your fish and plants thrive with this silent centrifugal pump that filter-cleans, aerates and recirculates the water, maintaining nature's environment. Filter hangs outside your tank... leaves your aquarium free for fish and decor. One piece molded "one-through" filter box... no seams to leak over.

Model PMB 8" x 7" x 7" high
Model PLS 12" x 7" x 7" high

Two Sizes in Fresh Water Tanks!

Supreme AQUAMASTER

The newest concept in aeration, circulation and filtration. Hanging outside the aquarium, the filter draws water through pump, strain dirt and rapidly recirculates clean aerated water. Silent, efficient motor runs 24 hours a day... no buzzing or bubbling, ever. New "one-through" filter box is one piece molded plastic... no seams to open.

Model PM 8" x 7" x 7" high
Model PL 12" x 7" x 7" high

Rugged! Compact! Dependable!
(Recommended for Fresh Water Tanks!)

Supreme ECONOMY MODEL PME

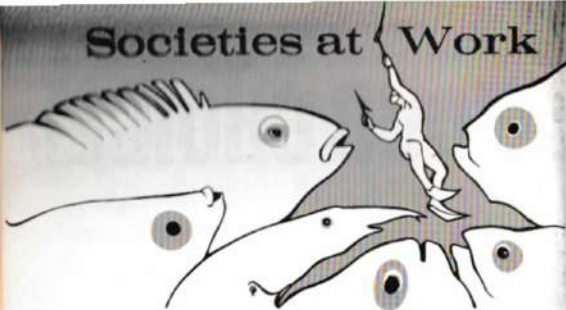
Famous Supreme quality in a new compact, budget priced model. Designed to aerate, filter and recirculate tanks up to 20 gallons. And so quiet, you'll have to look to see if it's running. Proven and time-tested for long life in continuous operation. 100% American made! Compatible with suction tubes and one-piece molded "one-through" filter box... no seams to open or leak over. There is nothing to match this Supreme model at this budget price.

Model PM 8" x 7" x 7" high
Model PL 12" x 7" x 7" high

Service and replacement parts always available on all Supreme products.

EUGENE G. DANNER MFG., INC.
1660 Summerfield St., Brooklyn, N.Y. 11227

Societies at Work



By Helen Simkatis

IF WE HAVE EVER SEEN *The Calquarium*, published by the Calgary Aquarium Society, it must have been a long time ago with the format of the publication changed considerably since then. When we received our package of the January through April issues for 1968 we thought it was a new bulletin until the index pages told us we had the first four months of Volume 10. The most attractive cover is in color and the composition of the bulletin is beautifully planned. Assistant Editor Larry Hume offers some basics on water chemistry covering pH, DH, and cloudy water, which should be helpful to beginners. Don Storr, in his *Non-dried Non-live Fish Food*, gives his variations to the time-honored Gordon Formula. For those who have not heard of this do-it-yourself fishfood, it is as follows: One pound of beef or calf liver, finely chopped and put through a blender twice. Strain through fine wire sieve. Add a tablespoon of salt, and mix with junior baby-size spinach. Add 14 level tablespoons of Pabulum and six of wheat germ. Stir well, pack in small screw top jars. Pasteurize 30 minutes. Cool and store in refrigerator. This version of the Gordon Formula is taken from Innes. Author Storr only uses half the recipe and freezes it. He uses both beef heart and liver and adds a spoonful of ground dried shrimp or fish meal. He also adds a jar of strained peas (baby food). He drops a frozen piece about the size of a small marble in each tank in the morning and supplements this diet with dried food, and live food occasionally. He does not believe that this food will replace live food for conditioning fish.

An article slanted toward the well-established hobbyist with a number of tanks is entitled *Compressors Anyone?* It is unsigned which may indicate that Editor Graham Wood authored it. At any rate, it is the most comprehensive article on the subject we have seen. We are told how to choose a compressor; a refrigerator repair shop is suggested as the best place to find one. A large double-piston type with a large flywheel (16 inches) is preferred by the author, and he describes his method of testing one. He lists the required hardware and then gets down to the brass tacks of installation. His instructions are enhanced by a simple line drawing. This is a reference piece for the serious hobbyist with a proclivity for things mechanical. All in

This is the Dynaflo Motor Filter. The best aquarium filter in the world. We couldn't make it better, so we made a bigger one, too.

Being words, perhaps, but they're backed up by 25 years of being in the aquarium and accessory business. There's only one speed with industry. The revolutionary Dynaflo is amazingly simple. Yet it will keep any aquarium clean as if you were on top. The

new Major Magnet Drive™ is a miracle of efficiency, with only one moving part slowly spinning on a nylon ball. No other gimmicks. No gears. No valves. No tubing. Nothing.

And what's more, it never wears it out. An ultra-quiet unit that hangs on the back of any aquarium, whether that of a beginner or professional. We couldn't make one better, so now you know why we had to make one bigger.





Ed Corder and our two native helpers, Arnaldo and Pedro, sorting fish caught with the help of the 30-foot seine. Such large seines are difficult to handle, and often are snagged on submerged sticks or brush.

AN AMAZONIAN ADVENTURE CONCLUSION

by ALBERT J. KLEE

AT THE PERUVIAN-COLUMBIAN BORDER it was necessary to stop for a routine border inspection by Peruvian officials. While Jon was closeted with the Post Commandant, the rest of our group remained with another officer while he recorded certain required information about each of us in a large ledger. I acted as interpreter. One of the things he wanted to know was our occupations. I was going great guns with simple things such as "piloto", ingeniero", etc., until Ed Corder offered the information that he was a "lithographer"! As a matter of fact, everyone suddenly seemed to sprout strange occupations, the Spanish equivalents for which

I couldn't even find in my pocket dictionary (which, by this time, was water-soaked with pages stuck together). Taking the easy way out, I simply gave everyone the title of "ingeniero". This aroused the suspicions of the official who remarked, "How strange, Senor, that for a party of tourists it should contain so many engineers"! To make matters worse, in answering the question of who were married and who were not, I casually remarked that all of our married men wore wedding rings. This worked fine until we got to Ed again and discovered that his wife, Ida, had made him leave his ring at home for fear of his dropping it in the Amazon or some such place. Only by showing the official the white band across Ed's ring finger where the ring had been, was I able to convince him.

In time, Jon finished with the Commandant and we were free to go. The trip downstream to Leticia was started in a fantastically heavy down-pour and we wondered why the canoes didn't fill with rainwater and sink. There was all sorts of floating debris in the river and had we hit any of it, it would have stove in the sides of our frail craft. To keep dry (especially our camera equipment) we used our "space blankets", metalized plastic cloths which could either keep heat in or out, depending upon which side was turned in, but which also was waterproof. Even with all these precautions, our cameras took harsh punishment and I estimate that more than half the camera equipment in the group failed to operate satisfactorily before the trip was over.

continued on page 65

24

35

WALKER: continued from page 5



Ancistrus temmincki has lower bristles than does *A. brevipinnis*. There are some species of *Ancistrus*, however, that would put a Smith brother to shame.

Hypostomus plecostomus is our most familiar member of a rather large genus of armored sucker-mouth loricariid catfishes. Their reptilian appearance and ability to dance across the aquarium wall or even hang motionless from the glass suspended by their sucker lips never fails to bring a "What is that?" from even the most stubborn of non-interested observers of an aquarium. *Hypostomus* means "mouth underneath" and *plecostomus* means "folded mouth". Although the first generic name used for this fish was "*Plecotomus*", a fact which would ordinarily cause it to be retained unless the name had been previously used, the name in its entirety did not conform to certain standards of nomenclature. In a special ruling the International Commission of Zoological Nomenclature declared that the systematic names of Gronow, who had named the fish *Plecotomus*, were invalid. The first generic name to come along thereafter which stepped on no one's toes was *Hypostomus* Lacepede. (If a more extensive explanation is desired, Albert J. Klee discusses the subject in *TROPICALS* Magazine September-October, 1964.)

H. plecostomus and his look-alike members of the loricariid family are decidedly innocent of such things as swallowing even their smallest tankmates although they often live for years and grow to a size of as much as twelve inches in the aquarium. With their sucker lips, not only do they vacuum-clean the aquarium floor after feeding time, but the hours between are spent in search of any scrap of accessible algae which is not too stubborn to be rasped loose and ingested.

36



The mouth is provided with small, weak jaws, and armed with feeble teeth; the food of the fish consists of soft detritus or the minute creatures contained within.

Although some of the loricariids have armor plates completely encircling their bodies, these are mostly the rather drawn-out members of the clan such as *Loricaria*, *Loricarichthys*, and *Farlowella*. The little "pigmy" sucker mouth catfishes of the genus *Otocinclus* also bear this feature, while *Hypostomus*, *Xenocara*, *Ancistris*, *Pseudancistris* and the handsomely barred *Panaque*, among others, are instead plateless on the ventral surface anterior to the anal fin. Aside from this very effective coat of mail, most of the species of the latter group, including our subject, *Hypostomus*, have an extremely large and powerful set of toothed pectoral fins. These are used at times by the males in combat, whiplashing at the adversary from a position parallel to him. There are also reports that some loricariids, like some of the callichthyid catfishes such as *Hoplosternum*, use these stout appendages to aid them in becoming ambulatory on land when the need arises. The ability to utilize atmospheric air further aids in making land excursions possible. This is done by "swallowing" air into the thin-walled intestinal tract where oxygen is absorbed by the multitude of tiny surface blood vessels which are present.

H. plecostomus, or the plecostomus as the fish might well be called since this is actually part of its name, is found naturally in tropical South America, Panama and Trinidad, while the number of other *Hypostomus* species occur on and off through much of this range. This is the most widespread species, however, and is consequently the most usual aquarium species. The fish is also found, somewhat less than naturally,

37



Who's watching whom? The eyes of this *Hemiancistrus* never lose sight of the photographer.



The mouth of a typical loricarid catfish sports greatly enlarged lips, spread in circular form about the oral opening.

in certain Florida and Texas waters. Specimens from one Texas river of over twenty inches have been reported. That's a BIG plecostomus! However effective or ineffective recent legislation concerning possession or importation of fishes, the intent of such legislation is to avoid such unnatural introductions, since no matter how innocent the intentions, no one can begin to estimate the eventual effect on nature. The best rule is NEVER RELEASE AQUARIUM FISHES INTO LOCAL WATERS.

The larger *Hypostomus* species can present somewhat of a mixed blessing to the plant enthusiast. The common types of green algae which occur on aquarium plants, rocks and glasses are attacked mercilessly with the rasping sucker lips, removing a substantial source of competition for the more desirable forms of plant life as well as helping to prevent a potential eye-sore from getting out of hand. On the other end of the stick, however, is the fact that as these fumbling, clumsy beasts begin to take on size and weight they often develop the unhappy habit of lashing their reptilian tails with enough force to uproot most plants and at least to partially uncover the root systems of even the most sturdily grounded vegetation. Some early reports stated that some species of loricarids burrow in the sand frequently. The only evidence I have seen of this is that occasionally some of the larger ones will push head-first underneath a plant, often uprooting it or may attempt to excavate a hiding place beneath a rock in this manner. There always appears to be some obstacle which the fish is attempting to go underneath, unlike the mastacembeid



Aw, now — are you kidding me? The "expression" on the face of this *Hypostomus* is almost human!

The underside of *Ancistrus brevipinnis*, showing the many forked bristles. The male has more bristles than the female, and more of them are forked.



A small *Hemiancistrus* species with interesting yellowish markings.



A species of *Laslancistrus*, showing its peculiar "sideburns". Many of the loricarids have these appendages.

Most of the species of *Ancistrus* (*Ancistrus brevipinnis* shown here) have prominent bristles around the mouth.



eels or the small "freshwater" flounders which will often go beneath the sand in the open part of the aquarium.

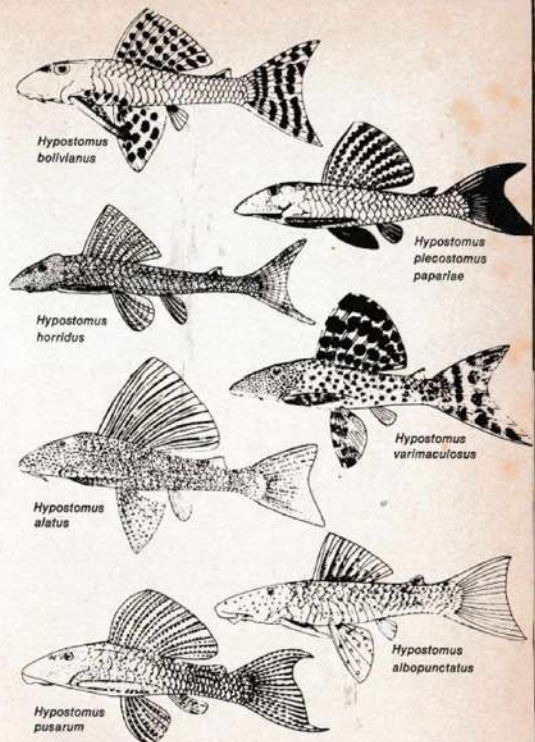
Designed for bottom dwelling, the plecostomus has not only a flattened belly for the purpose of sliding along, but even the lower half of the caudal fin has been pressed upward through countless generations of scooting over the floors of South American creeks and rivers. The entire remaining physiognomy of the fish is compressed downward, possibly to make it less conspicuous and to offer less friction as the fish moves over the bottom, up a leaf or stump or faces the occasional torrent.

Not only are the *Hypostomus* species algae eaters, mud and silt are also ingested for the less apparent but still present nutritional value contained in the form of algae and other microorganisms which may not be visible. The long, coiled intestines of wild specimens often contain these rather unappetizing contents, further proving that very little of the matter available in nature is not utilized by someone.

There are quite a number of these hypostomine (Subfamily Hypostominae) catfishes, some are larger or smaller and some are even more fantastic in appearance than the real *H. plecostomus*. Some are trickier in their appetites than others. All are fascinating, however, and most are hardy. Boiled oatmeal, Gordon's Formula or presoaked dried dog food of the non-gravy type are eaten with enthusiasm by most of them, and in a large aquarium after the customary feeding procedure has become established in their minds, a "feeding noise" such as the aquarium cover being moved will bring the entire flock sailing toward the wonderful spot with all the boundless grace of a covey of winged water buffaloes.

Most of the *Hypostomus* species bear enough similarity to each other to make identification a bit harder for the aquarist than with some other fishes, especially since aquarium literature to date has been rather sparsely illustrated as far as they are concerned. There are those, however, with distinctive characteristics which make identification easier such as *Hypostomus carinatus* with its sail-like dorsal and with plates arranged so that distinct horizontal rows are visible, and *Hypostomus bolivianus* which is adorned with oversize polka dots on its fins. Because of the increasing number of fishes being imported and the increasing interest which dealers are showing in the more unusual varieties which were once considered by many of them to be unprofitable, we are including line drawings of some of the more interesting and distinctive species to aid the serious aquarist in identifying them when they appear from time to time.

There is something about these ungainly creatures which warms a place in the hearts of most of us who have kept them. It is significant that in a seven-foot aquarium containing a number of very large fishes, some of which are rather rare and unusual, several different *Hypostomus* species in the ten to twelve inch bracket are invariably singled out for



conversation by onlookers. Personally, I wouldn't be without a couple of the homely critters! ●

EDITOR'S NOTE: Upon occasion, a "rogue" plecostomus will develop that will attack and injure other fishes. Such a fish should either be relocated with very large fishes, or destroyed. AJK



A male pink congo. The male's fins are longer than those of the female, but he lacks her brilliant coloration.

SYMMES: continued from page 7

Now for the big surprise—they aren't temperamental like angels; they aren't almost impossible to keep alive like discus; they don't have to be two-years old to breed like Oscars; but, like other cichlids they do love to dig in the gravel, and that's good for any time you can count on a fish to do one thing with regularity, then you're ahead of the game! You can count on pink Congos to signal their maturity and readiness to spawn by large scale gravel-moving operations. Knowing this in advance we can eliminate one of the most difficult problems for the beginning aquarist—plants.

What attributes does this fish have other than digging in the gravel? They are one of the few peaceful cichlids. Both parents will live compatibly in the same tank with their fry. They are beautiful fish, and they spawn at a very small size and tender age. For all these reasons and because they take excellent care of the young, they are an extraordinary fish for any aquarist.

Now that you're interested, how do you take care of them? They will live in water that is either acid or alkaline, and will breed at temperatures from 70° to 85°; water certainly isn't a problem. They aren't susceptible to any particular disease, so that isn't a problem. They eat live, frozen, paste and dry foods, so feeding isn't a problem. Although the young may bother smaller fry, the mated pair usually doesn't, so compatibility isn't a problem.

You may be asking, "If all these things are so easy, then what is a problem?" There seems to be only one—how do you "turn them off?"



One of the few aquarium fishes where the female is prettier than the male. In this female, the red pigment cells are especially apparent.

Once you have a pair they just keep spawning, and spawning, and spawning. A pair that first spawned in an 80-gallon refrigerator liner was then moved to a 29-gallon tank where they again spawned, and then to a 10-gallon tank where they are still spawning. They have not been tried in a 5-gallon tank, as the male is about four inches long and the female three and one half inches. A five would just be asking a little too much! A small pair about two inches long has been spawning every ten days in a 5-gallon tank with only a flower pot for decoration, however.

If, after all these warnings, you would like to try "turning them on," then there is an easy way to do it. Beg, borrow, or buy a pair, then feed them twice a day on a flake food. They'll probably spawn. If not, add some frozen brine shrimp to their diet once a day—presto! Instant pink Congos.

Breeding can be done in a bare tank with only a flower pot in it. The aquarium may also be pleasingly decorated by placing a large rock on the bottom of the bare aquarium. Then, build a sturdy rock formation on it at one end of the tank. Use Silastic to bind the rocks together. Next, add a piece of driftwood, a large rock or a flower pot at the other end of the tank. Let the Silastic cure overnight. Now add water and as much gravel as you would like to see moved each day by the Congos. Usually, just enough to cover the bottom and fill in between the rocks and other immovable objects will give a pleasing and somewhat natural effect. If you want to add more gravel, a good rule-of-thumb would be to remember that for every inch of overall gravel depth, the pink Congos



Out of breeding season, the two sexes are sometimes a bit difficult to tell apart. The female is the upper fish.



The gill-flaring spawning posture is common to many cichlids.

will pile it up an inch and a half at the front of the tank (EDITOR'S NOTE: From now on, this will be known as "Synmes Law"!) An outside filter will keep the aquarium clean.

If you have a flower pot in the tank, they will spawn in it, and it doesn't matter how the pot is arranged in the tank. If you place it on its side, the eggs will probably be laid on the inside from half-way up the side, into the top. The female tends the eggs and the fry. She will not let the male enter the flower pot, but he probably can be seen keeping an eye on things through the hole in the bottom of the pot.

There is great variation in the time from egg-laying to hatching, and from hatching to free-swimming, depending on the temperature of the water. Eggs may hatch in one to three days, and the fry may take four to seven days to become free-swimming. At the free-swimming stage the male will frequently take over protection of the fry. They may be fed dry fry food and live brine shrimp nauplii. Their growth is directly related to the amount, quality, and frequency of feedings you can manage without fouling the water. If you have been using an outside filter, the fry can be transferred to a tank with a bottom filter for easier maintenance. They are very hardy fish, and even "hanging" (i.e., before free-swimming) fry may be transported to your next aquarium society meeting to share with other aquarists.

Although I have had dozens of spawnings, I have never seen the pair actually doing the deed! They must be the quickest egg-layers in captivity. On one Saturday, my fish room needed more than the usual

As the nuptial play commences, the female's color brightens. In this photo, the female is the fish on the right. The pink congo was developed by a Fort Worth, Texas aquarist named Kenneth Griffin. In 1963, Mr. Griffin discovered several albino and semi-albino fish in a spawn of zebra cichlids. The albinos were lost, however, but the semi-albinos survived to become known as "pink congos".



This female is guarding eggs that are living (dark-brown) and also some that were infertile and which have begun to fungus (whitish patches).



The next day, the eggs have disappeared but that patch of "dirt" at the rear of the flower pot is a mass of fry!



Fry, 12 hours old. The yolk sac (the large speckled area) will be absorbed before they become free-swimming.



Six day old fry. At this point, both parents watch over them closely and will drive any intruder away.

amount of attention (it was the week after the annual aquarium show) and the whole day was spent in that room. About six we had supper and by the time I returned at seven they had laid over 400 eggs.

I do not want to get in the middle of a popular name battle; however, I do feel that I should mention that these same fish have been variously called the "golden," "cream," "white," and "pink" "Congos" or "convicts," so don't be upset if your local dealer doesn't have any "pink Congos," but does have "gold Convicts." They all come from the same original stock, a spawning by Kenneth Griffin of Fort Worth, Texas, in

1963, and should exhibit similar characteristics and temperament. There does seem to be color variation in the females, some have only a belly patch of red, while in others the color extends in the shape of bars to the base of the dorsal fin where it forms another bright-red band.

If all these reasons are not enough to induce you to run out and buy a pair of pink Congos, then there is one final consideration—it is just about the only fish that a female aquarist, or an aquarist's wife, can point to with pride and say, "You see that fish, Mabel; that's the female. You can tell because she's the pretty one!" ●

EDITOR'S NOTE: There has been a great deal of controversy over the popular name of the Congo cichlid recently, much of it akin to "How many angels can dance on the head of a pin" variety. In particular, it appears that some aquarists are mistakenly referring to *Cichlasoma severum* as the "convict" cichlid. *Cichlasoma severum* is a rather old aquarium fish as compared with *C. nigrofasciatum*, and historically has been referred to simply as the "severum." (The Germans have christened it, on occasion, as the "Augenfleckbuntbarsch" or "eye-spot cichlid", but recent usage has also been to call it "severum".)

The first popular name in this country for *Cichlasoma nigrofasciatum* was the "Kongo" cichlid, a reference to the name the natives in Central America (its home) applied to it. William T. Innes, however, discouraged use of this term because it caused some confusion in geography. An early German name for the species was "Gruenflissenbuntbarsch" or "green-finned cichlid."

Over the years, another term for *Cichlasoma nigrofasciatum* was adopted in this country, viz., the "zebra" cichlid. In recent years, this has also been adopted by German aquarists. We read, in the 1955 edition of Axelrod and Schultz' "Handbook of Tropical Aquarium Fishes," that *Cichlasoma nigrofasciatum* is the "zebra or convict cichlid," and that *C. severum* is the "banded cichlid". In 1962, however, Axelrod *et al.*, in their "Exotic Tropical Fishes", refer to *Cichlasoma nigrofasciatum* as the "convict cichlid," and *C. severum* as the "convict fish." This is a rather sorry state of affairs, indeed. We do not subscribe to the Alice In Wonderland approach, "... a word means exactly what I choose it to mean, nothing more. ..."

In conclusion, it seems that popular usage would reserve "zebra," "convict" and "Congo" to *Cichlasoma nigrofasciatum*, with *C. severum* being referred to simply as the "severum." Unfortunately, we are headed for some additional mischief in that one of the new Nyasan cichlids, viz., *Pseudotropheus zebra*, is being called the "zebra" cichlid, also. Since the name more logically belongs to this fish, it is recommended that only "Congo" be applied to *Cichlasoma nigrofasciatum*, and further that *C. severum* be referred to only as the "severum". AJK



Herman Rabenau, our first commercial importer.

manufacturer (he took out a patent for his famous "Peerless" aquarium in 1912... he was the first circa 1915, to put a one-piece aluminium tank on the market), although he did continue importing as did Rabenau. In 1913, he actually sent collectors to the Amazon basin to bring back the first wild angel-fishes America had ever seen (others, not wild, had been previously imported from Germany).

Three other aquarists, all from the New York-New Jersey area, deserve mention at this point; Isaac Buchanan, Dr. Frederick Schneider and August Obermuller. Buchanan succeeded Eugene Smith as President of THE AQUARIUM SOCIETY; Schneider was a prominent member of that organization and was an influential figure in the hobby for many years afterwards. Buchanan was later a President of THE AQUARIUM SOCIETY also and like Dorn, actively engaged in importing aquarium fishes on a non-commercial scale. August Obermuller deserves special mention because he was our first significant commercial breeder of tropicals.

One of Halterbeck's importations in the year 1908 has provided the basis for an amusing story regarding the difficulties these early pioneers experienced. This particular consignment consisted of two large cans of danios. When Halterbeck arrived at the port to receive his fishes, the customs inspectors held up the shipment, assuring him that an import duty had to be paid. The officials were stumped. What classification were they to give this importation? But, after giving the matter much earnest deliberation, they arrived at the conclusion that live fish were in the same category with "Dried Food Fishes" and accordingly taxed the fish at the



Left: Dr. Frederick Schneider;

Right: John J. Halterbeck.

rate of fifteen cents for each pound.

During the examination of government documents and records, Halterbeck, sensing the humor in the situation, called two of his old friends to the scene. These, Dr. Frederick Schneider and Herman Rabenau, of course offered Uncle Sam every assistance! Having decided that the fish were to be taxed by weight, the next act in the comedy was to weigh them. Uncle Sam's first proposal was to weigh the cans and charge for the gross weight, to which our three aquarists voiced their objection. Why should they pay an import duty on German water? America was not dry at that period. There was no urgent need for importing water. Therefore, they flatly refused to pay on that basis.

Then Dr. Schneider offered a solution. He proposed weighing a bit of board and then heaping the fish thereon to be weighed. This caused dissension in the ranks of the three fish fanciers. Halterbeck, who owned the fish, objected to the idea on the grounds that his fish would suffer in the procedure. Finally, the idea was abandoned and the group went into another huddle to decide on more satisfactory ways and means.

Rabenau then suggested that the fish first be caught from one can and then the can and its water content be weighed. Thereafter the fish were to be put in to the can that had been weighed and re-weighed with the fish. Determining the net weight of the fish would then resolve itself into a simple example in subtraction.

But lo, here another hitch was encountered. There was no fish net available to catch the fish, so another idea was rejected! By this time the



Rabenau's conservatory in Brooklyn, New York. The fish house was heated by a hot water system, and the aquaria on the right-hand side of the picture were devoted to tropicals.

trio and their problem had aroused much curiosity, and there were gathered together all the best minds connected with the customs house, office and all.

After a long, drawn out conference, it was mutually agreed and decided to allow the fish to enter the port, duty free, as *honored visitors* with permission for an indefinite sojourn in our country. The officials and our triumvirate of fish fans formed a reception committee for this shipment of danios that possibly may be the forefathers of the very fish in your tanks at this time. Your fish may even boast, among themselves, of that historic occasion when their great-great-great-great grand daddies (also mothers) outwitted Uncle Sam and landed, not at Plymouth Rock, but in the port of New York!

In November 1910, the first aquarium exhibition in America not solely devoted to goldfish, was held at the Battery Park Aquarium, under the sponsorship of THE AQUARIUM SOCIETY. The year 1910 was also the year that Walter Brind traveled to Germany, consulting with breeders and scouring that country for aquarium fishes to bring back with him to the United States. He returned with over 30 different species and this importation, coupled with those of Richard Dorn and Isaac Buchanan, proved to be the first really large importations of the hobby.

Upon his return to Chicago, Brind wrote a letter to Herman Wolf:
Dec. 5, 1910

Herman T. Wolf, esq.
Bourse Bldg., Phila., Pa.
Dear Sir:

I am indebted to Henry A. Dreer for your name and address. I wrote him asking for the names and addresses of persons in Philadelphia who had imported tropical aquarium fishes during the past summer and he said that you know these people and can furnish me the requisite information.

I got back from Europe about the middle of October and brought about thirty species with me and now I want to get in touch with people who also have such fish in Philadelphia, in order to have them as corresponding members of the Chicago Aquarium Club, of which I am president, and also to arrange for the exchanging of young fish when we have any later on, so as to avoid breeding "in-and-in". I know dealers in Europe who told me that they had shipped fish to Philadelphia during the past season and they are the parties I want to correspond with. Thanking you in advance for the favor of a reply, I am,

Yours very truly,
WALTER L. BRIND

This letter, however, was answered by William T. Innes:

Mr. Walter L. Brind
Dear Sir:

Mr. Wolf is unable to answer your question regarding tropical aquarium fishes and turned over your letter to me.

The only recently imported tropical fish I know about are Dwarf Gouramies. I had an article on this fish in "Guide To Nature" earlier this year. I am acquainted with a great many fish fanciers here, but aside from myself none of them take any interest in fish other than Goldfish. What did you import and do you find any of them especially beautiful or interesting? Can you get Rainbow Darters in Chicago? They belong to the Mississippi Valley. I have been most anxious to secure some of these.

I spent some time last summer gathering small wild fish, but have concluded that it is not satisfactory to keep in one aquarium fishes of entirely different habits. I have had the most pleasure out of an aquarium stocked with Silverfins. These are scarce. They are most active, seeming to keep at play constantly, chasing one another about and enjoying a perpetual revel. They take food from the surface of the water like a trout, making a dash for it. They live well in the aquarium, but are liable to jump out.

Would also like to know about your Club.

Yours very truly,
WM. T. INNES

A number of things are interesting about this correspondence. First, it shows the limited knowledge that Philadelphia aquarists, including Innes himself, had concerning tropical fishes at that time. Second, Brind refers to himself as president of the "Chicago Aquarium Club", a somewhat premature action as Brind, being the controversial character that he was, did not get along too well with his fellow hobbyists and consequently, the club never did get off the ground. Therefore, in early 1911, a new Chicago club was formed called, THE CHICAGO FISH FANCIER'S CLUB, with F. S. Young as President and F. G. Orsinger as Secretary. Young later on became head of the Jackson Park (Chicago) Aquarium and then superintendent of the entire Park; Orsinger rose to become Director of the National Aquarium in Washington, D.C. Thus, although Chicago should have had the third (not counting TRITON or SALAMANDER) society in the United States, it really wound up fourth as we can hardly count Brind's abortive attempt as a bona fide group. The BROOKLYN AQUARIUM SOCIETY was formed only a few weeks prior to the CHICAGO FISH FANCIER'S CLUB.

Third, the correspondence led Innes to visit Chicago where he established lasting friendships with both Orsinger and Young. This visit really awakened Innes to the fact that tropical fishes were in the United States and stay they would. Since this further led Innes in his well-known work in the aquarium field, it might be said that Chicago and its aquarists played an important part in the future development of the hobby.

Innes and Brind met also, of course, but from then on it was more or less a rival relationship, especially on Brind's part. Years later, when Innes referred to Brind whimsically as "Old Reprobate Brind", Innes received the following letter:

Dear Innes:

May I refer to your probably jocular reference to myself as "Old Reprobate Brind"? You later on honor me as "Friend Brind", which at least places us on something of a common level. I question whether all of your readers know of your prankishness, and that the term is likely intended as one of endearment. At any rate, Mrs. Brind and I so take it, and had a hearty laugh after the first shock wore off.

Sincerely yours,
WALTER L. BRIND

Undoubtedly, it is the second decade of the 1900's that marks the beginning of the modern phase of the aquarium hobby in America. One event of significance (on February 14, 1911) occurred when the BROOKLYN AQUARIUM SOCIETY was formed, with William F. De Voe as its first President, chiefly from the membership of THE AQUARIUM SOCIETY residing on Long Island. It had been realized for some time that THE AQUARIUM SOCIETY covered far too wide a geographical area to meet the

54



The Halterbeck "Peerless Aquarium", patented in 1912.

convenience of travel for those days. There were, in addition, certain differences of opinion that contributed to the formation of this new group. The BROOKLYN AQUARIUM SOCIETY was, for example, much more scientifically inclined and paid more attention to the subtleties of organization than did the parent society (which, from now on, we will refer to as the NEW YORK AQUARIUM SOCIETY, although it still catered to New Jersey aquarists residing in the Greater New York area).

As it turned out, the Brooklyn society was to play an important role in these crucial days of the hobby. As a start, it published the third aquarium magazine in America, the *Brooklyn Aquarium Society Bulletin*. The first issue appeared in May 1911 and although originally planned as a monthly periodical, the second issue appeared in September of that year. From that time until the Spring of 1912, it did appear monthly.

The *Bulletin* was a rather large magazine as aquarium periodicals go, some 9 by 12 inches, and consisted most frequently of 4 pages. Although

55



Our first aquarium "writer", Christian J. Heede.

primarily intended for its own society's membership (initiation dues for which were \$1.00, with annual dues of \$2.00), subscriptions were available at 60¢/year with individual copies selling for 5¢ (about \$1.80 and 15¢, respectively, in terms of today's currency). Although De Voe was its first editor, this post went to Dr. Rudolph Lienau in September 1911. The remainder of its editorial staff included some very prominent aquarists including Hermann Rabenau (whose first name was, at times, also spelled as "Herman") and Christian J. Heede.

A typical issue was that of September 1911. Articles included were: *Live Bearing Fishes* by C. J. Heede, *How To Start And Manage A Terrarium* by Hermann Rabenau, and *Shipping Live Fish*. Departments included were an editorial and a *Wants and Exchanges* column. There were, in addition, 1½ pages of advertisements. Other issues posted meeting notices, reviewed books and answered queries. Although it may be difficult to believe, the article on shipping live fish mentioned above describes the use of oxygen in shipping! The oxygen was bubbled through the water contained in a 1-gallon pickle jar, the jar top then being sealed off with kraft paper. A number of jars (with their piscine charges), cushioned with paper, were afterwards sent off in a wooden crate.

An article by C. J. Heede in the November 1911 issue is of special interest because it is the first article in an American aquarium magazine on the guppy. We reprint it here verbatim (the proper name for the guppy now is, of course, *Poecilia reticulata*).

POECILIA GUPPY!

"This is another livebearing fish which, with *Girardinus reticulata* (our next article) and *Poecilia poeciloides*, belongs to the species *Acanthophaelus*. (Editor's Note: Heede is somewhat confused here. All of these names are synonyms for the guppy, *Acanthophaelus* being a genus erected by Eigenmann a few years before and basically a synonym for *Lebistes*. The fish that Heede was referring to as '*Girardinus reticulata*'

56

was really *Phalloceros caudomaculatus*, our first aquarium live-bearer.)

Poecilia guppyi are found in Venezuela, Trinidad and Barbados, in the latter place they are called the 'millionfish' on account of their great abundance. They are also found in the Dutch colony of Surinam and in its capital Paramaribo. The fishes are raised, then liberated in ponds to catch and eat the larvae of the mosquitos, thereby stamping out malaria. In several English colonies the local governments have distributed this species of fish, amongst ponds and other still waters with the intention to extinguish the larvae of the malaria-giving mosquitos. These fishes were first imported to Europe in 1908 and account of their beauty have won many friends among fish fanciers. Others were imported to New York last spring, but are only held by a few collectors.

These fishes breed every four to six weeks, bearing at first 7 to 15 young and later, as with all livebearing fishes, a greater number of young. The parent fishes are not very cannibalistic toward their young, still the aquarium must be well stocked with plants, both below and on the surface as a protection for the brood, *Myriophyllum* and floating plants being especially adapted to this purpose. The safest way would be to remove the newly born to another aquarium; a teaspoon is a handy article for this purpose.

The coloring of the male fish is very beautiful, red, yellow and dark

AMERICA'S LARGEST PRODUCERS OF AIR EQUIPMENT FOR THE HOBBY TRADE

GUARANTEED NOT TO BURN YOU TO BURN PRODUCE OR CONSUME IN SUPER EXCELLENT PERFORMANCE

MODEL "C" All Combi Pumps are made of American materials only!

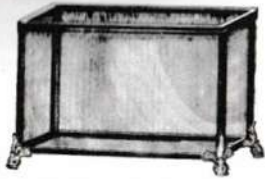
MODEL "E" - 1" COLUMN

WHERE ENGINEERING KNOW HOW IS A FACT! NOT FICTION!

MODEL "A" No. 10-10000

MODEL "T" 1 1/2" DIA. COLUMN WITH No. 17000

NEW ROCHELLE MFG. CO. INC., 207 WASHINGTON AVE., NEW ROCHELLE, N. Y.



A tank of the type sold by The Aquarium Specialty Company, Brooklyn, New York, in 1911. Note the charming "fish legs".

spots, and lines cover his yellowish colored body. Two dark spots are found on each side of the fish, one near the gill cover and one near the tail, the latter resembling an eye somewhat similar to that seen on the peacock-eyed sunfish.

The coloring varies according to the temperature and condition of the fish. Hardly two males are alike and they change their marking and coloring continuously, even while watching the fish for a short time one can easily observe the rapid changes. Poeciliids are about one inch long and are one of the smallest aquarium fishes in existence. The females are

AMAZING NEW AQUARIUM FILTER

New for Hobbyists! The amazing DIRT MAGNET aquarium filter designed for trouble free hatchery use and in daily operation in hundreds of the finest and most modern Tropical Fish Hatcheries throughout the world is now available to you!

This exciting new filter uses the tiny rotifer (a microscopic live fish food) to clean the aquarium water, improve water quality and increase the growth of tropical fish. Fish color and quality has been noted to improve markedly after installation of this new filter on the same air lines as formerly supplied charcoal or sub sand filters. There is no glass wool or charcoal to change as the filter element is permanent and self cleaning.

The tiny rotifers consume waste without the reaction noted from ordinary sub sand type filters. Plants not only grow even over the filter, they thrive! Magnificent foliage with lush green color throughout the aquarium plant spectrum. Wastes are converted by rotifers to rich plant food so beneficial to tropical fish as well as tropical plants. Tests show even tap water will become quite similar to rich jungle stream water where tropical fish do so well in the wild.

DIRT MAGNET filters will operate under the sand, on the sand or in an absolutely bare bottomed tank with equal ease. POSITIVELY will not trap babies when used in breeding tanks.

A set of two filters (suitable for up to 50 gallons) will be sent postpaid upon receipt of \$4.58 in areas where unavailable through dealers. Send check or money order along with your name, address and zip code to:

JUNGLE LABORATORIES CORPORATION
609 W. OAKRIDGE ROAD, ORLANDO, FLORIDA 32809



A more ornate structure was this terrarium of 1911. These were still quite popular at this time.

plain; of a yellowish pearly color, and larger than the males."

Guppy fanciers will no doubt find the above account helpful in explaining the origin of the guppy in the United States. Heede's account puts the importation of the guppy into America at about April-May 1911. Undoubtedly this is the importation of Emil Bade.

A word about Christian Heede is in order here. He was our first "aquarium writer" and from 1911 to his death in 1920, authored many informative articles about tropical fishes. In this manner, he aroused popular interest in the aquarium hobby. Further, in addition to being a charter member of the BROOKLYN AQUARIUM SOCIETY, he introduced the red ramshorn snail into the United States. The red ramshorn had been introduced to German aquarists about 1900 and was later imported into Denmark. During a trip to Copenhagen, Heede discovered the snail there and carried several back with him to Brooklyn. A hobbyist from Philadelphia obtained a few from him, subsequently to bring them to Philadelphia. As he was leaving he asked Heede for the name of the snail and Heede, for a moment unable to think of the scientific name (*Planorbis corneus*) said, "I imported them from Copenhagen". Consequently, they became known as the "Copenhagen snail" although that name is now no longer used.

Heede's interest in biology began about 1870 in Denmark, the land of his birth. In his obituary of Heede, William Poyser (we will meet him later) said: "He combined the characteristics of the naturalist with those of the fancier, and his original research work coupled with an extensive first-hand knowledge of the literature of the subject in several languages, placed him in the front rank among aquarists. He will be remembered as a lovable and generous man, ever ready to share his great store of knowledge—and fishes and plants—with his friends." Although not included among the five great aquarists of American hobby history, Christian Heede at least ranks with Walter Brind in our aquarium

THE MARKET PLACE

PHILADELPHIA'S
LARGEST DISPLAY
of rare fresh and salt water tropicals
MARTIN'S SUPERARIUM
7171 Ogontz Ave. Philadelphia, Pa. 19138
Lowest Prices Anywhere • Wholesale & Retail

THE DEGAULLE GUPPY

(Flag of France)
The most unusual breed of this era. A large, fine hybrid with light face, but black body. Raring red tail, and white dorsal fin. Pacific females are olive color with black cast. They breed true. \$12.50 per pair. (\$4.50 extra for 100.)
Other varieties include Alpine Vail, Red Peacock, Las Vegas Green, Lovender. \$7.50 per pair. (\$2.50 extra for 100.)
Guaranteed Live Delivery, Postpaid, Airmail. Send check or money order to . . .
MANHATTAN AQUARIUM SERVICE
224 - 21st St. Manhattan Beach, Calif. 90266
PHONE: 545-4421

SHOW GUPPYS

CHAMPION BREEDING STOCK By Dick Eisenmann "Guppy Man of the Year" for '65-'66 & '66-'67. WRITE FOR FREE BROCHURE, 4375 State Road, Cleveland, Ohio 44109 FL J-4003.

BRING THE SEA INTO YOUR LIVING ROOM DICK BOYD'S CHEMI-PURE TESTED 10 YEARS The original ionic filter medium. Keeps artificial or sea water in perfect P.H. balance for years without changing water. There are counterfeits. But only one CHEMI-PURE. No carbon shock. 10 to 20 Gal. 1 Unit 4.95
1 to 9 Gal. 1/2 Unit 2.49
Boyd Enterprises postal M.O. only.
P.O. Box 3937 Miami 1, Florida

HEADQUARTERS FOR AQUARIUM NETS

From 2 inches to 10 inches

COMPLETE LINE OF:
• Cotton • Daphnia
• Nylon • Goldfish
• Brine Shrimp Nets
Sold Through Wholesale Distributors Only
J. HANKIN CO.
1000 GOLFMAN ST. NEW YORK 38 N. Y.

"CHARLIE" is ALIVE!



MEET "CHARLIE..."

He is the most CUDDLY, LOVABLE life form in this UNIVERSE! "CHARLIE" crawls, climbs, eats raw meat and live insects, loves all kinds of vegetables, and most of all . . . wants to be loved by you! "Charlie's" life expectancy is approx. 4 1/2 to 7 years. WATCH this remarkable little creature lure, catch, and eat live insects with its trigger action traps! WATCH, as "Charlie" crawls to you and eats a piece of lettuce RIGHT OUT OF YOUR HAND!

"Charlie" comes complete with an exciting 5 piece Greenhouse Garden Terrarium Kit that includes a real live seeded lawn and a 30 day supply of "Charlie Wondermeal", "Charlie's" favorite food. (Live insects not included.) "Charlie", complete with environmental home, sells for \$9.95 at your dealer. If he does not have "Charlie", send a check or money order to

THE INSTITUTE OF MUTANT BIOLOGICAL RESEARCH
P.O. BOX 442, FLUSHING, N. Y. 11352

LIVE DELIVERY IS GUARANTEED!

DEALERS . . . Please use letter head when writing for information.

heritage.

Another item of interest in the early days of the *Brooklyn Aquarium Society Bulletin*, was a controversy, albeit friendly, between the Society and William T. Innes. Innes took issue primarily with two statements in the November 1911 issue of the *Bulletin*, viz., that the orientals extracted the dorsal fins from some goldfish, and that it was advisable to place earth under the sand in planting. Innes disagreed with both ideas; certainly he was correct in the dorsal fin question and the *Bulletin* concurred, in its silence, on this point. On the matter of earth below the gravel, none other than Hermann Rabenau himself replied. Rabenau made the very excellent points that Innes was considering the question from the point of view of goldfish or, as Rabenau put it, "fish of rude habits", and that in nature it is the soil bottom which supports luxuriant vegetation, not sand or gravel.

It is difficult to determine just who first thought of the idea of a joint society publication. During the year 1911, an attempt had been made by the BROOKLYN AQUARIUM SOCIETY to effect a closer relationship between it and the New York club but to no avail. Dr. Lienua stated: "Somehow or other it is next to impossible to solicit a reply to most any question or letter addressed to the New York Society. This may be due to their small meetings, again due to the inclement weather at present, or to a general

EUREKA
Assures More Healthful Aquariums!

POWERHOUSE VIBRATOR PUMP
STAINLESS STEEL DIAPHRAGM
NEVER NEEDS CHANGING



2 YEAR GUARANTEE MADE IN U.S.A.

QUIET! LONG LIFE!
HIGH POWER!
RUNS 10 OUTLETS!

Nifty
AQUARIUM HOUSE CLEANER



NEEDS NO PUMP

The sensational EUREKA NIFTY will thoroughly house clean your aquarium, purging the gravel right in the tank without disturbing equipment. No mess or bother.

EUREKA PRODUCTS CO., 4 Bloor St., Newark, N. J.
WORLD'S FINEST AQUARIUM PRODUCTS

IF YOUR SOURCE IS UNABLE TO SUPPLY YOU, WRITE FOR INFORMATION

inertia—usual in aquaria during this season!" This statement was somewhat charitable as there was a great deal of obstructionism and bickering within the New York club at that moment. Richard Dorn, Vice-President at the time, was furious but could do little about the situation.

Through the efforts of William T. Innes, however, progress was made and Innes finally received a commitment from New York and proceeded with their proxy. At the same time, he communicated with the Chicago club which received his ideas with enthusiasm. Thus, the practical implementation of the concept of a joint society venture, the first in the history of the hobby in America, mainly fell to Innes and the leaders of the BROOKLYN AQUARIUM SOCIETY.

On January 21, 1912, Innes and a fellow member of the Philadelphia Society journeyed to Brooklyn where they met with De Voc, Heede, Lienau and others of the Brooklyn group, and arrived at the following proposals for the four aquarium clubs then in existence:

1. To publish jointly, a magazine to be called *The Aquarium*. The magazine was to be 8 pages, 6½ × 9½ inches in overall dimension. The Innes printing firm was to do the printing.

2. Each society was to elect a local editor and a local business manager.

3. The societies would elect an editor-in-chief.

The clubs at the time were: the BROOKLYN AQUARIUM SOCIETY, W. F. De Voc, President; the CHICAGO FISH FANCIER'S CLUB, F. S. Young, President; the NEW YORK AQUARIUM SOCIETY, Isaac Buchanan, President; and the PHILADELPHIA AQUARIUM SOCIETY, William T. Innes, President. Each of these groups met and subsequently approved the proposals. The venture also had the approval of the then great names in the hobby . . . Bade, Smith and Mulertt. The members of the Brooklyn club graciously agreed to merge their *Bulletin* with *The Aquarium*, and the societies elected as their editor-in-chief, none other than Eugene Smith himself.

Thus, in April of 1912, the first issue of *The Aquarium* appeared, backed by four aquarium societies, two of which were old (New York and Philadelphia) and two of which were relatively new (Brooklyn and Chicago). Three of these clubs were involved in the more general fields of the hobby (New York, Brooklyn and Chicago) and one specialized in goldfish (Philadelphia). It was another milestone in the hobby, more about which we shall say in the next installment. Further, it established William T. Innes as an influence in the hobby, an influence which was to reach its peak some 40 years later.

To be continued.

continued from page 26

used for raising baby guppies?
Answer: You might use a five-gallon tank if you only have a few breeding trios but professional breeders favor 10-gallon tanks.

Question: When will I be able to sex the babies?
Answer: Usually the babies will show sex by the end of the first month in that the females will be larger by then than the males; also,

the males will be showing some color.

Question: How soon after birth may I move the babies to the tank containing their parents?
Answer: By the end of the third month the babies will be large enough to go with their parents but, of course, they will not attain their potential growth if this tank is already crowded. ●

DEPENDABLE and SURE... PREVENTION and CURE



AQUA-BIOTICS™
 AQUARIUM PHARMACEUTICALS INC.
 BOX 638 IDEPT, PA., DREXEL, PA. 19025

NEW!
CERAMIC COLORED GRAVEL



CERAMIC BAKED-ON BEAUTY
 ON GORGEOUS NATURALLY SHAPED SMOOTH STONES APPROXIMATELY ¼" SIZE
 ABSOLUTELY CLEAN — NO DUST — NO WASTE
 NON-TOXIC — PERMANENT TO CERAMIC COLORS
 CAN'T FADE — WILL NOT DISCOLOR FRESH OR SALT WATER

ASK YOUR JOBBER FOR THIS REALLY "HOT" ITEM
 JOBBERS: WRITE IMMEDIATELY FOR PRICES AND SAMPLES

MANUFACTURED BY: AQUARIUM PRODUCTS
 4100 AQUARIUM PLACE, BALTIMORE, MARYLAND
 MANUFACTURERS OF REGULAR COLORED GRAVEL TOO.

continued from page 24

providing incentive to others to lead a useful and resourceful life within their respective limitations".

Braz Walker is clearly one of the great aquarists of our generation, but in my book, he is a great man as well. AJK



GEORGE PETTY

George Petty is a junior at the University of Kansas, Lawrence, Kansas, majoring in a pre-law program of international relations and Latin American studies. Among George's interests in addition to the aquarium hobby, we can also include the raising of dachshunds. This is not the first article he has had in *THE AQUARIUM*, and he also has had short fiction pieces published in other than aquarium hobby periodicals.

SOLUTION TO THE AQUARIUM CROSSWORD

C	L	O	W	N		T	O	P	S
A	S	A	B	L	U	E	F	I	N
T	A	C	T	I	L	E	T	C	A
F	A	E	R	I	E	R	K	I	
I	R	R	N	R	A	B	E	L	
S	O		K	I	S	S	E	R	S
H	O	P	L	O		U		E	
Z	E	B	R	A		C	O	O	L
H	E	R	A	K		K		R	
A	T	I	N	N	A	T	E	A	C
I	L	L	D	E	R	E	C	T	S
R	E	S	T	A	T	E		H	A
R	E	S	T	A	T	E		H	A

CLEAN AQUARIUMS
ONE HAND OPERATION
LARGER VALVES
LONG LIFE
GUARANTEED



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

CLEAN AQUARIUMS
 SOLD BY FINE DEALERS AND DISTRIBUTORS EVERYWHERE
 FREE CATALOG
Framar Mfg. Co.
 3958 ALLA ROAD
 LOS ANGELES - CALIF. 90066

KLEE: continued from page 35

There were, however, two thrills I extracted from the trip back to Leticia. A minor triumph was that, after all those days wending our way through the jungle, I had a chance to shave right in the middle of the Amazon River, but the number of cuts and nicks produced as the canoe shot the rapid current just wasn't worth the effort. When the rain let up, however, a beautiful rainbow appeared that arched across the river from one bank to the other. It, in effect, reflected both God and Nature simultaneously, and I doubt that anyone was unaffected emotionally by the sight.

To say that we were a pooped group upon arrival in Leticia is an understatement. After avoiding disaster all throughout our Yagua expedition, Warren Dody managed to fall into the river as he attempted to retrieve his gear from his canoe. Suffice it to say that Warren was neither graceful as he went in, or gracious as he came out! Further, Win Rayburn, Duane Wait and I found that our hotel room had been given over in our absence to an anthropologist who had emerged from a two-month collecting trip in the jungles. However, he offered to share his space with us and we gratefully accepted. The only problem was that his indian artifacts were strewn over beds, tables, shelves, etc., and we had to relocate them before we could go to bed. Unfortunately, the artifacts harbored hosts of assorted insects, a goodly number of which quickly

WHERE DOES QUALITY COUNT? — AT PARAMOUNT OF COURSE!

Live bearers are raised on our own Farm under careful supervision. South American Imports are brought in on our own plane with experts in attendance. All Fish are fully acclimated before being sold. Stock Tanks are inspected daily to maintain the healthiest fish obtainable. Orders are individually filled by highly skilled and trained personnel only.
 Economize with the best — Buy PARAMOUNT.
 2 Locations to serve YOU, Better!

WHOLESALE ONLY



ARDSLEY, N. Y. 10502 P.O. Box 627, Tel. OWent 3-4800-3-4801
 VERO BEACH, FLA. 32960 Emerson Ave., P.O. Box 277, Tel. JOrdan 2-5487



Mt. Parnell Fisheries
INC.
"QUALITY AND SERVICE"

"THE FISHERIES OF THE EAST"

DISTRIBUTED THROUGH
SELECTED JOBBERS.

MERCERSBURG, PENNA.

AREA CODE 717-369-3018

AQUARIUM PLANTS
Our 31st Year in Business



AMAZON SWORD—BEST CENTER PLANT
Full line best Aquarium Plants
Greenhouse grown plants are better! We have 200 ft. greenhouse for growing most beautiful plants in the world!
Orders write on letterhead
Also, 1968 Water Lily Catalog illustrated in color

SLOCUM WATER GARDENS
Dept. A, 1101 Cypress Gardens Rd.,
Winter Haven, Florida, 33880



Get Our New Large Catalog with
OVER 600 Illustrations, many in Color
\$1.00 Postpaid

BELOTT'S AQUATIC and PET SUPPLIES
Since 1920
Hazelwood, Missouri 63042

Rila

NEW PRODUCT... A MAJOR BREAKTHROUGH IN THE SALT WATER HOBBY
RILA NITRITE-NITROGEN TEST KIT

- WILL DETERMINE THE LEVEL OF TOXIC NITROGEN COMPOUNDS IN THE AQUARIUM WATER
- TESTS ARE ACCURATE, EASY & ECONOMICALLY PERFORMED
- REGULAR TESTING WILL ALERT THE HOBBYIST TO ANY CHANGE IN NITRITE LEVELS & TENDS TO PREVENT TOXIC CONDITIONS FROM OCCURRING
- REAGENTS CARRY THE MANUFACTURER'S LIFETIME GUARANTEE FOR STABILITY & ACCURACY
- COMPLETE PLASTIC PACKAGING FOR DURABILITY & EASE OF USE
- AN ESSENTIAL ITEM FOR EVERY SALT WATER HOBBYIST

FREE! A NEW BOOKLET, "BASIC CHEMISTRY OF THE SALT WATER AQUARIUM"
Ask your dealer today or write for complete Product Information Bulletin and NEW FREE Brochure. Please include ZIP

RILA PRODUCTS • P.O. BOX 116 • TEANECK, N. J. 07666

transferred their attentions to us. Consequently, we were forced to have our beds sprayed with DDT every day at noon.

Our anthropologist friend was a storehouse of tales as he related his experiences over the years with the natives as, for example, the time his colleague had a piece taken out of his posterior by a piranha while he was skinny-dipping in a Brazilian river. But, the time to return home was drawing near and it was necessary to attend to certain details such as getting our plane refueled. We purchased a number of 55-gallon drums of what was purported to be aviation gasoline but which our copilot swore was 50% water. It was customary, after filling our fuel tanks, to open a small petcock which led to the bottom of these tanks, to drain the water which (because of its weight) would settle to the bottom of them. This time, Bob had to drain for 45 minutes and even then, he wasn't convinced that all of the water was out. I think he spent one afternoon calculating in which tree we would land should the engines quit on takeoff.

We had, however, one last day in Leticia and so elected to go fishing. Outfitting a canoe with nets, plastic bags, polyfoam boxes, etc., we started off for a tributary of the Amazon, located a few miles west of town. Rain still plagued us but it was light and intermittent. Surrounding yellow-water rivers such as the Amazon are depressions which become

Your Fish May Be Victims of Hard Water — Less Lively...Less Colorful... Hard to Breed!

Hard water contains an excess of calcium and mineral impurities. This can be as tough on fish and plant life as polluted air is to humans. When the air you breathe is clean and wholesome, you feel healthier... more active, have more color in your cheeks. The same principle applies to your fish. In fact, very hard water may even impair their respiratory systems. So why deprive your fish of the healthy environment of soft water when two simple steps can solve your problem.

First, See How Hard the Water is with **CHECKRITE**. Second, Soften the Water Properly with **SOFTRITE**.

CHECKRITE
A few drops from the numbered bottles... a swirl... you get a reading in seconds. Accurate, safe, dependable. Includes complete instructions. (Lasts two years) **\$2.95 each**

SOFTRITE
Just place Softrite in the filter, and water is softened — quickly, completely. Safe, harmless. Lasts forever — can be used over and over again. **\$1.35 each**

AQUARIUM STOCK COMPANY, INC.
27 MURRAY ST., NEW YORK, N. Y. 10014 BEVERLY HILLS, CALIF. 90210

inundated during the rainy season. The river banks are the highest point; beyond them are found flat meadows yielding to a still higher region which is not flooded (see sketch). At the onset of the rainy season these depressions fill with water and form spawning areas for the fishes of the rivers and their tributaries. Our visit to Columbia coincided with the end of the rainy season and consequently, we encountered many young, half-grown fishes as well as adults.

When the bodies of water to be fished are reasonably large, as ours were, the seine forms the backbone of the collector's equipment. Seines are most efficiently worked using three people. One man is stationed at each end of the seine. It is their job to keep the top edge of the seine near the water's surface (by means of floats fastened to the upper edge of the seine), and the bottom edge just touching the bottom of the stream or pool. These two men then carefully, but quickly, work the seine to the shore. The third man creates a commotion in the water, either by stomping with his feet or agitating the water with a paddle or his hands, which causes the fish to dash into the net concealed by this time by the muddy water which results. As soon as the net is pulled up by the end men, the third man scoops the fish, usually with his wet hands, into a floating polyfoam container stationed nearby. We used two sizes of seine; a 10-foot size and a 30-foot size. The latter was very unwieldy in use but it swept a very wide area.

TRUE-BREEDING GUPPIES
by
RON and TINA AHLERS



Prize-Winning Large Delta Tails


Beautifully Colored Red & Blue/Green Strains. Complete Information With Each Order On How You Can Raise Your Own Healthy Strains From These

TRUE BREEDERS
1 Pair 2 Pairs 1 Trio 2 Trios*
\$7.50 \$13.00 \$11.00 \$18.00

*Same Strain

NO ODOR MICRO-WORM CULTURE
That Lasts a Month or More — \$1.50
With Fish Order \$1.00.
All Prices Include Prepaid Air Mail.
Special Delivery, Add \$ 5.00.
Send Check or Money Order To:

MID-ISLE AQUARIUM
P.O. Box 206 TAM, Deer Park, N. Y. 11729
Live Delivery Guaranteed



ATTENTION HOBBYISTS!
Don't Miss Fabulous:
SALT WATER AQUARIUM MAGAZINE

- BEAUTIFULLY ILLUSTRATED
- LATEST FINDINGS IN SALT WATER FIELD
- PUBLISHED BI-MONTHLY
- APPRAISED BY READERS WORLD WIDE

\$2.50 per year \$8.00 for 2 yrs. (Sample copy 50¢)

CORAL REEF EXHIBITS
BOX 2214 AMF BR, DEPT. A
MIAMI, FLA. 33159

The complete set of all 18 issues, covers all back issues to date. \$30.00 postpaid. (Up to Nov. Dec. 1967)

CREDITS

PHOTOS:
THE AQUARIUM, A. Roth, P. 4-8, 36-41, 44, 46-47, 75-78; E. Symmes, P. 45, 48; THE AQUARIUM, A. Klee, P. 34-35, 73-74.

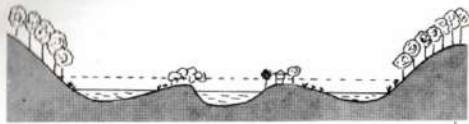
FISH:
SPOTTED CATFISH on cover courtesy of S. Liberman, Paterson, N. J.; OTHER CATFISH supplied by Dade County Fisheries, Bronx, N. Y.; PINK CONGO supplied by Grassy Forks Fisheries, Saddle River, N. J.; PLANTS supplied by Slocum Water Gardens, Winter Haven, Fla.



Never Buy Fishfood!... Again, Man.
Just grow your own... It's cheaper.

1. BUBBLES PROTEIN... \$1.75
2. BUBBLES... \$1.75
3. BUBBLES... \$1.75
4. BUBBLES... \$1.75
5. BUBBLES... \$1.75
6. BUBBLES... \$1.75
7. BUBBLES... \$1.75
8. BUBBLES... \$1.75
9. BUBBLES... \$1.75
10. BUBBLES... \$1.75
11. BUBBLES... \$1.75
12. BUBBLES... \$1.75
13. BUBBLES... \$1.75
14. BUBBLES... \$1.75
15. BUBBLES... \$1.75
16. BUBBLES... \$1.75
17. BUBBLES... \$1.75
18. BUBBLES... \$1.75

AQUA ENGINEERS
Box 1, Ortonville, Michigan 48462



Diagrammatic representation of a cross-section of a yellow-water river. The depressions on either side are described in the text. The low water level is shown; the high water level is indicated by the dotted lines (note that the water comes up to the level of the house on stilts.)

of water, devoid of aquatic plants. The vegetation that is present is found only on the banks. Thus, aquarists going for the "natural" aquarium need only about 2 gallons of water and 3 gallons of mud per 5-gallon aquarium; add some silvery, nondescript tetras that wouldn't bring a nickle in the average fish store, and some large predator-type cichlids to eat the tetras, and you have the "natural" tank!

The day to leave arrived and found us packed and ready to go. Transportation to the airport, a mile or so out of town, was via truck, driven by what can only be described as a disciple of the Marquis De Sade. Ruts and holes in the dirt road were ignored; as a wheel would enter one of these holes, our equipment would rise about three feet off

ATTENTION PET SHOPS!

Have you received our No. 5 catalog on Aquarium supplies? Over 1000 items listed for your aquarium department. Write to us on your business letterhead.

TEMPEL'S

TROPICAL FISH
2005 E. Olive St.
Decatur, Ill. 62526



1968—18th Anniversary
in the United States

THE INVISIBLE FRENCH FILTER & AERATOR

Still Unique with Sandlike Body

A highly efficient aquarium conditioner, achieving a natural balance. Originally conceived to be buried under sand, to work without cleaning, out of sight. Bacteria-activated porous member can be used with any grade of gravel, or even in the bare tank, and still work biologically. Does not hinder plant growth but stimulates it by natural fertilization. Sets without dismantling tank. Maximum aeration, ideal for breeding. (Patented)

Originated by

M. & A. VANSTEENKISTE
149-54 114th PLACE
SOUTH OZONE PARK, L.I., N.Y. 11439

the bed of the truck, and we with it. Only by holding onto the truck's railing were we able to stick with it. Overhanging branches acted as a giant scythe, sweeping across the top of the truck and forcing all to duck. Those who weren't quick enough, received instant flat-top haircuts and headaches. At the airport, our leaving prompted a sort of town celebration (presumably not because they wanted to see us leave but because visitors in their own planes were rare). Columbian customs officials were cooperative and courteous. We stacked our baggage in front of the plane and they examined a small portion of it in a short period of time. We loaded up and said our goodbyes to the many friends we had made during our trip, and who had come to see us off. Mike Tsikalas' niece even dressed up in a Columbian airline stewardess' uniform for the occasion, and posed with us in front of our plane for the occasion. A B-25 never did have a prettier "honorary stewardess"!

Our flight across Columbia and Venezuela was without incident. Even the water-laden gasoline caused no trouble. We were required to refuel once on the homeward journey and we selected the Dutch island of Curacao where in former times, the French and the English made the sea boil with their buccaneers, but in modern times is famous for its scenery, its shopping centers, its oil refineries and its friendly inhabitants. Here, located a few miles off the coast of Venezuela, are located 140,000 people of some 45 nationalities living on a sun-soaked, sand-filled island.



NEW AQUARIUM FILTER & STERILIZER

The Ultraviolet Sterilizer slips right into a specially designed outside hanging filter. It's out of sight — all you see is a completely different aquarium. Kills bacteria & fungus. Eliminates cloudiness. Reduces unpleasant odor. Absolutely safe for fish & plants in freshwater or saltwater. At your dealer or order direct. \$24.95 postpaid. Free brochure.

STER-AQ
15702 S. F. Mission Blvd.
Granada Hills, Calif. 91344

38

YEARS
OF RELIABILITY •
QUALITY • SERVICE •

That's
EVERGLADES II
Known for fine Aquarium
Plants • Home Grown Tropicals
• Conditioned Tropicals
PET DEALERS & JOBBERS
We want you on our mailing
list.

WHOLESALE ONLY

Write us!
**EVERGLADES AQUATIC
NURSERIES, INC.**
P.O. Box 587, Tampa, Florida

It can also be recalled that, in the nearby leeward island of Saint Eustatius, the American flag was saluted for the first time in history, in 1766.

We checked in at a beachside hotel in the capital city of Willemstad, and had hot showers for the first time in three weeks. The city of Willemstad boasts several unusual items including the longest pontoon bridge in the world. When the bridge is open, a free ferry service (operated by the Government) maintains communication for pedestrians across the St. Anna Bay that the bridge spans. The Prins Hendrik Wharf is nothing but a floating supermarket as produce boats are tied there and unload their wares onto concrete stalls on the pier. Housewives shop from the street side in the shade of sails and sail cloths set up on the boats especially for that purpose.

One of the most interesting places we visited was Fort Nassau, built between 1792 and 1796, which overlooks the harbor, the Shell refinery, the blue Caribbean and Willemstad itself. The places where the soldiers used to sleep, drink and sing are now dining rooms, although on the terraces the guns still point their muzzles at the harbor entrance. Another site of interest is the Curacao liquor distillery at the restored estate house, Chobolobo, where a drink may be enjoyed "on the house". It was difficult to make up our minds to leave Curacao, but our funds were running short (indeed, upon my arrival back in the United States I had only \$2 in my pocket!) and we had to depart for Miami, our next stop on the trip home.

The landing at Miami was in a terrible rain. How Jon and Bob ever saw the runway is still a mystery to me. As usual, we had to endure the overbearing, rude behavior of U.S. customs officials and inspectors. Rather than send an inspector out to our plane, we were required to rent a trailer, unload everything and bring it into the customs building where we would spread it out on their shiny, stainless steel tables where it would be superficially examined by bored bureaucracy. I rented the trailer, and two of us went with it out to the plane in the driving rain.

We unloaded most of the duffel bags and got to the indian artifacts which I knew would be ruined by the rain and the packing-repacking routine. I was pretty annoyed by this time and decided to go back to customs with just the duffel bags, taking the chance that the customs officials would not chance getting their nice uniforms wet. Passing the word to the other fellows, we lined up at the table, one person per duffel bag. Since we hadn't brought all of the luggage back on the trailer, several men didn't have any luggage to stand by. We solved this problem by "lending" luggage to them, and it was pretty funny watching them explain to customs officials, items they didn't know anything about. One of the fellows went through with just an overnight bag and I worried that he would have a hard time explaining how he managed to get by for three weeks on just a tube of shaving cream and a toothbrush, but the



From left to right: Duane Walt, Vern Parish and Warren Dody, using the 12-foot seine. Such seines were the backbone of our collecting gear.

Not every net-load holds desirable aquarium fishes. More often than not, nondescript, silvery fishes such as these would form the bulk of the haul.



The fish collected make up a good variety of cichlids, characins, catfishes, etc. Here is an unidentified (and new to the hobby) species of *Aequidens* of a rich, golden color.





Our last sunset on the Amazon, for this trip at least.

official just waved him on. I don't mean to imply that we did not declare everything that we legally had to declare. This we did and we filled out the necessary forms down to the last dotted i and crossed t. What we were fed up with was the callous attitude and disregard for the property of others shown by U.S. Customs. Their "system" was set up for the usual kind of tourist who steps off a commercial flight and magically has his bag appear on the customs table without lifting a finger. Here we had a plane full of equipment, gear, cumbersome souvenirs and luggage, representing 10 people, that would take four hours to load and unload, and Customs would not alter their precious "rules". Well, they didn't have the inclination to get wet, either, and as it turned out we could have smuggled in an elephant without their being the wiser. At no time during our trip to Aruba, Columbia, Brazil, Peru or Curacao, did the customs officials of those countries treat us with anything but good humor and courtesy.

The last leg of our trip was to Columbus, Ohio, and we had telephoned ahead to our wives to meet us at the airport. Consequently, the scene at the airport was a madhouse of women, children, dogs, and family cars and station wagons. It took us two hours to unload the airplane but finally, everyone was on his respective way. We all had a lot of catching up to do re family and local news, but the satisfaction of successfully completing our 10,000 mile journey to new worlds was something that each of us would savor for the rest of our lives. ●



A small species, not exceeding six or seven inches in height, is *Sagittaria teres*.

Most aquatic plants can be broken down into three classes: Single-root, bunch and floating. We will discuss each class briefly. Most of the plants we use today fall in the group of single-rooted plants. The basic parts of the plants in this class are: roots, stem, crown and leaves. Each leaf is borne upon a petiole, or leaf stem, the length of which may vary. Leaves and reproductive parts, such as runners or flower stems, arise from the crown of the plant. Remember, when these plants are planted the crown must not be covered or injured.

This class, single-rooted plants, can be further divided into tape grass, group plant and center plant types. The tape grasses have long, ribbon-like leaves. Their root system is small so that they can be planted close together without suffering from competition. We shall discuss two genera, *Vallisneria* and *Sagittaria*.

Vallisneria spiralis, *V. spiralis forma tortifolia* and *V. gigantea* are the three species which we usually will find in the home aquarium. *Vallisneria spiralis*, common *Vallisneria*, is probably the most versatile and hardiest in this group. *Vallisneria spiralis forma tortifolia*, cork-

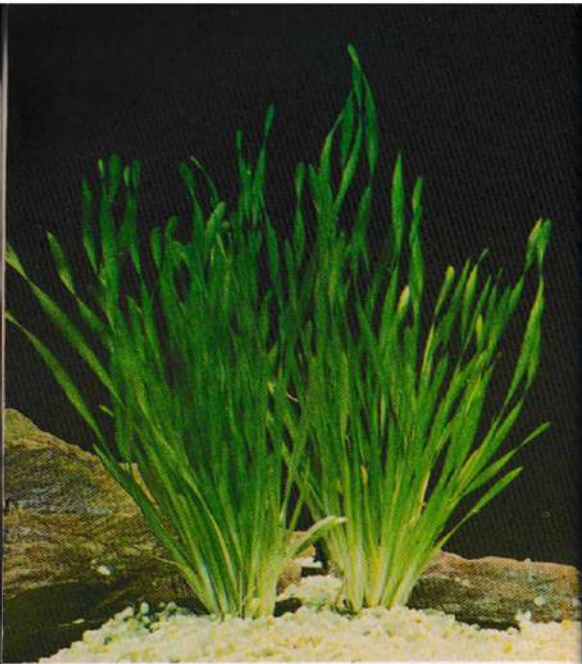


Not really a true "aquatic". *Spiranthes latifolia* or "underwater orchid" is an interesting change of pace for the aquascaper.

screw *Vallisneria*, is another variety but its leaves usually will not exceed 8 to 10 inches in the aquarium. This species likes bright light and alkaline water. *Vallisneria gigantea*, called jungle *Vallisneria*, is a species seldom encountered in the aquarium as the leaves may reach a length of over 36 inches. This species can only be used effectively in a large aquarium.

There are more kinds of *Sagittaria* than *Vallisneria* and because of this, they are more difficult to classify and describe. These plants do not have separate sexes such as is found in *Vallisneria*. *Sagittaria* reproduces primarily by means of runners. *Sagittaria subulata* is the most en-

countered species of this genus. The species resembles *Vallisneria spiralis* in size and shape, its leaves somewhat slimmer and denser. It will grow to over a foot in length, but tends to "tailor its size" according to the water level. You might also find it identified as "*Sagittaria natans*" or "*Sagittaria subulata natans*". *Sagittaria subulata forma pusilla*, is often referred to as "needle sag". Its leaves are thin and narrow, rarely exceeding 8 inches in height. This species is a good plant for small aquaria. Sometimes it is identified simply as "*Sagittaria pusilla*". *Sagittaria filiformis*, sometimes known as *Sagittaria gracilis*, has a narrower and smaller leaf than does *S. subulata*. However, water



One of the standbys of the aquarium hobby, "corkscrew val" or *Vallisneria spiralis forma tortifolia*.

conditions and growth are similar. *Sagittaria platyphylla* differs from most forms of "tape grasses". This species has broad, flat, fairly thick leaves, which grow up to 10 inches in length. This species is a vigorous reproducer sending runners in all directions at the same time. *Sagittaria eatonii* resembles *S. platyphylla*. However, it is smaller and has narrower leaves. As a general rule all the tape grasses require clean water, low in nitrogenous wastes, and moderate to bright lighting. Temperature range from 70 to 80° F. *To be continued*

TetraMin is so pure you can see through it



Photo by TetraKraftWerke, Melle, W. Germany



A clean, thin tissue of TetraMin rolls off our finishing machines, like a sheet of earth-brown silk—30 miles of it every day, enough to feed 100 million tropical fish the world over. It is so pure, so finely made, that you can see through it. And not one speck will ever cloud aquarium water. Give science the credit.

TetraMin tropical fish food is the result of blending, mixing and combining 48 natural fish food ingredients, animal and plant, from actual fish environments. We add a touch of precious vitamins and other vital substances for better health and better fertility—then fill the familiar TetraMin can to overflowing with tiny

flakes of the finest, purest staple diet you can buy. You can see that it is pure.



Experience and Success speak for . . .

TetraMin