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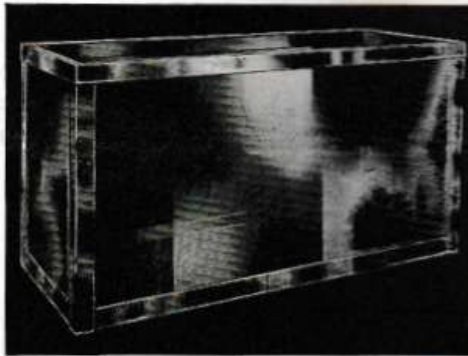
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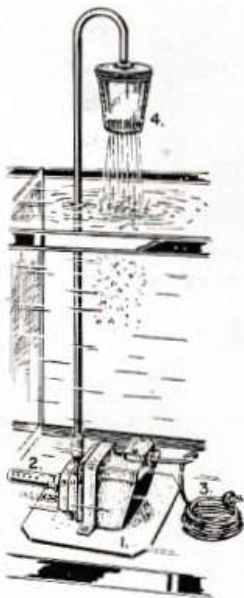
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25	34.00	42 lbs.	40.00
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27	38.00	66 lbs.	44.00
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29	50.70	95 lbs.	59.70

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### Shipping Weight Of Display Aquariums

No. 22	10 lbs.	No. 26	105 lbs.
No. 23	26 lbs.	No. 27	125 lbs.
No. 24	48 lbs.	No. 28	200 lbs.
No. 25	85 lbs.	No. 29	265 lbs.

**BELDT'S** Aquarium, Inc. ROBERTSON, MISSOURI

# THE AQUARIUM

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INNES PUBLISHING CO., 129 North Twelfth Street, Philadelphia 7, Pa. \$2.50 per year, in United States and South America (except Guianas), 25c per copy. Canada and other countries, \$3.00 per year, 30c per copy. Neither text nor illustrations from *The Aquarium* may be quoted or used without permission by the publishers.

Entered as second-class matter, May 27, 1932, at the post office at Philadelphia, Pa., under Act of March 5, 1879.

Vol. XXII

OCTOBER, 1953

No. 10

## *Contents*

	PAGE
The Aquarist's Calendar.....	282
The Wagtail Platy, by Myron Gordon.....	283
Aquarium Heating, by Edward J. Panner.....	285
How To Be Free of Surface Aquatic Insects.....	287
Spawning <i>Aequidens portalegrensis</i> , by Genevieve T. Pfeiffer.....	288
The Amazon Sword Plant, by Walter Bertholdt.....	291
Who Has These Champion Goldfish We Have Been Hearing About?.....	294
<i>Rasbora trilineata</i> , The Scissors-Tail.....	295
The Editor's Letter (How Long Can Fishes Fast?).....	296
The Greatest Killer Of Them All, by C. E. C. Cole.....	298
Revolutionary Development For Fish Shippers, by Alan M. Fletcher.....	301
Aquarium Gadgets (Aqua-matic Dip Tube).....	302
The Pike Cichlid, A Bad Actor.....	303
Planting Your Aquarium, by 2nd. Lt. F. R. Buckley.....	304
Getting The Most Out Of Your Filter.....	305
Insulated Fish Cabinet, by G. Bishop.....	306
This Is My Problem.....	308



# THE AQUARIST'S CALENDAR



**O**CTOBER, in many parts of the country, is a "betwixt and between" period. Cold spells are common; also many hot days and cool nights which make it exceedingly difficult for those who are carrying either delicate fishes or some of the more hardy ones. Right at this time is where a good thermostat-heater combination is at its best. Good temperature control means more now than at any other time of year in order to take care of the rapid ups and downs.

In some of the southern and lower central areas, many hobbyists still have a few hardy fishes outside. Even so, it is best to get them inside early so they can become thoroughly acclimated before the really cold weather hits.

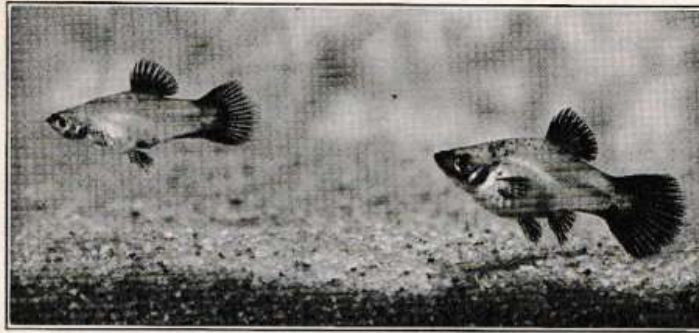
October is also the month in which indoor cultures of all kinds of live-foods should be well underway. Micro worms, white worms, Drosophila and earthworms are among those most practical. One of the very best investments a hobbyist can make is to start out about four or five 24"x36"x8" storage boxes of earthworms. Collect those that are about 3 or 4 inches long. Try to pick up a solid ball of them that would normally fill an ordinary tea-cup. Fill the storage boxes with well sifted garden soil, mix in some finely crushed dry leaves, make the soil moist but not wet, sprinkle some dry oatmeal or a bit of Pablum on the top. Dig a shallow pit and place the worms in it and cover

them over. Then put a piece of glass over the box right on top of the soil to keep in the moisture. They will do best at a temperature of about 65 degrees. Feed them more oatmeal or Pablum whenever they clean up that which is on the surface of the soil. A set-up of this kind, by feeding the fishes sparingly on the finely chopped worms, should last nearly all winter and keep a fairly large number of fishes in excellent condition all during the months when Daphnia and mosquito larvae cannot be obtained.

As a rule too, by the 10th of October, most of the hardy water lilies are done blooming and should be stored for the Winter in a cool, moist spot. Remove the root-stems and leaves from the tubers and keep them in cool water or cool moist sand in a rather dark spot. If light and warmth get to them they are liable to start sprouting, which is to be avoided at all costs.

Indoor tanks will now be needing more and more light, not enough to start the algae growing, but as the days grow shorter and shorter, enough good artificial light should be added to make up the difference. Although fluorescent lights are considered not quite so beneficial to plant life as the incandescent bulbs, they do create much less heat and the "warm-white" tubes are more effective than the blue-white "daylight" tubes.





## THE WAGTAIL PLATY

by *Myron Gordon*

New York Zoological Society

**N**O WAGTAILS exist in nature. They are products of a marriage of a wild and domesticated strain of Platyfish, an event which took place in New York City in 1939.

Among the wild Platies that survived the long 4,000-mile journey from their native pools in Mexico to their city quarters in the New York Aquarium and the American Museum of Natural History were a number of fish that had a black line on the upper and lower margin of their tail fins. This distinctive color variety was given the name of Comet. The strain had never been distributed among the commercial tropical fish breeders, although a few of them had been imported in 1932 on a previous expedition to Mexico.

When the Comet Platy was mated with its wild kind, the comet pattern was transmitted to the off-spring, sometimes to all of them, sometimes to three-quarters of them, and sometimes to only one-half of them. The import-

ant point is this: the black streaks of the Comet were exactly like the original.

But when the wild Comet Platy was mated to a domesticated type like the gold or to a Red Platy, an entirely new form appeared, the Wagtail.

The fins of the Wagtail seem as if they were carefully retouched by a clever pen-and-ink artist. Every delicate fin ray, not only of the tail and dorsal, but some of the other fins, as well, appears as a deep black, finely drawn line. While the thin tissue between the black fin rays is transparent, the fins, as a whole, appear decidedly black.

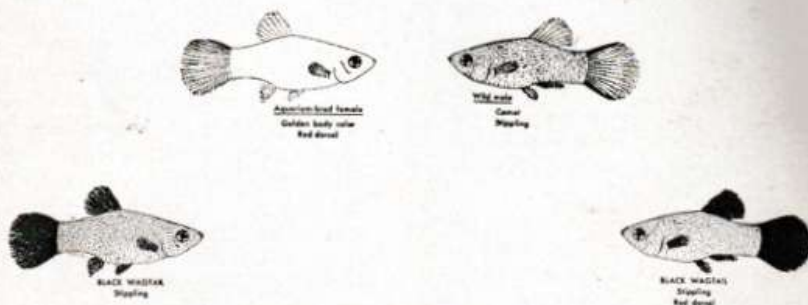
In many animal breeds the extremities are black pigmented. Cat fanciers will recognize the close resemblance of the color scheme of their Siamese cat with that of the Wagtail Platyfish. Somewhat similar color patterns may be found in the Himalayan rabbit, in the dilute fawn breed of the Great Dane dog, in the Hampshire Down sheep and probably in many more.

Many Platyfish breeders that I have talked to have the notion that all wild-caught Platies are muddy-colored and unattractive. They are mistaken. The silver-colored wild Platy with its Wagtail pattern is like pewter on black lace.

The Silver Wagtails cannot compete with the more brilliant Golden Wagtail. The contrasting colors of a golden body and black fins appealed to the aquarist and made it the most popular variety of the Platy. Even today, when the brighter Red Wagtail is also available in every aquarium shop in America and in Europe, the Golden Wagtail is holding its own. Reports of its popularity extend to Turkey, India, Ceylon and Australia. And Señor Jorge Delaye, dealer in tropical fishes in Mexico City says that the Wagtail is tops in demand in Mexico, the home of the Platyfish.

After a decade of breeding and improving the Wagtail, the aquarist now has a choice of a variety of color schemes. One of the most delicate varieties just developed is the Pink Lady Wagtail. The lower Wagtail in the color print by Mr. Innes resembles the new variety. Another recent development is the Bleeding Heart Wagtail which is somewhat similar to the Pink Lady, but the male Bleeding Heart Wagtail has bright, blood red coloring about its throat.

The Wagtail Platy, be it Silver, Golden, Red, Bleeding Heart or Pink-Ladyish may be just a pretty fish to the home aquarist, but to the geneticist, the scientist who studies the intricate principles of inheritance, the Wagtail is an outstanding example of man's ability to produce new forms from old varieties.



#### THE ORIGIN OF THE WAGTAIL PLATY

The top pair represent the parents. The male, on the right, was a Comet. Apparently the hereditary pattern for Comet was in a pure state when the male was mated with the Gold female. All their offspring were Wagtailed, a new pattern that depends upon the combination of the wild Comet and the domesticated Gold character. When the gray Wagtails of the first generation were mated together, brother to sister, out of every 64 young born in the second generation, there were nine Golden Wagtails.

## AQUARIUM HEATING

by Edward J. Panner

SOME TIME AGO we found it necessary to construct a special heater for one of our larger aquariums. The first consideration was, of course, wattage, and a search through our assorted aquarium literature gave us many different answers, all based on watts per gallon. Finding so much dissention, we decided to do a little checking of our own, and what started to be a small detail became the subject of a study which was quite involved and extensive. It was felt that our experience and results would be of interest to serious fanciers and therefore this article was written.

It would probably be well to begin with a few basic facts involved in heating anything, whether it be an aquarium or a kettle on a stove. It takes a definite quantity of heat to raise the temperature of any object any given amount. If we assume that there are no losses, then, when that object reaches the desired temperature, no further heat is required. The object will remain at that temperature. Unfortunately losses are present and we must supply sufficient heat to make up for them. If we supply more heat than we lose, the temperature of our object will rise. Conversely, if we supply less than we lose, the temperature of our object will drop. It can be seen that to maintain constant temperature, only heat lost must be replaced, regardless of any other factor about the object we are heating. We can, therefore, calculate heat loss for any object under a given set of conditions and that loss will represent the amount of heat required to maintain a constant temperature.

Let us consider for a moment the various types of heat loss.

- (a) Conduction loss: This is the loss of heat through the glass and the air due to their physical contact.
- (b) Radiation loss: This is the loss of heat by infra red radiation from the aquarium and is a small fraction of the total loss.
- (c) Evaporation loss: This loss of heat is a direct result of evaporation at the surface of the water and can be prevented in part by covering the aquarium. This practice has a great many other advantages and is highly recommended.

A study of the problem has shown that radiation losses and evaporation losses are negligible. The loss which is of greatest concern is conduction loss through the six sides of the aquarium. Attempts at calculation of these losses for each individual side and through the several types of material used for aquarium and aquarium support construction proved fruitless, so loss figures were derived from measurements on an aquarium of average construction under average conditions. This empirical loss constant has been used many times in our measurements since it was first derived and has proved itself to be completely reliable.

It has been shown that aquarium losses are proportional to total outside surface area and therefore "watts per gallon" figures are *not* valid. If the capacity of an aquarium of given shape is increased eight times, the total sur-

face area is increased only four times. While capacity increases as the cube of linear dimension increases, the surface area increases only as the square of that linear dimension.

The practical application of the above information was the next step in our problem. It was felt that an aquarium heater should not have the capacity of raising the water temperature more than twelve degrees fahrenheit above room temperature. This figure was chosen for several reasons; a defective thermostat could not cause our fish to be "cooked" and yet the room temperature could drop to fifty-eight degrees without the tank temperature dropping below 70 degrees. In addition to this a heater of such size would not cause very rapid temperature changes.

Complicated loss formulae have been simplified to two practical forms:

- (a) The size of a heater, in watts, necessary to raise aquarium temperature twelve degrees above ambient or room temperature under average conditions is given to a satisfactory degree of accuracy by the following formula:

$$\text{Watts} = 4 \times \text{Area} \\ \text{(total in sq. ft.)}$$

An example of such a calculation follows:

If we have an aquarium 8" x 10" x 16" in size (5 1/2 gallons) we find heater wattage as follows:

$$\begin{array}{l} 2 \text{ sides } 8'' \times 16'' = 128 \text{ sq. in.} \\ \text{in.} \times 2 = 256 \text{ sq. in.} \\ 2 \text{ sides } 8'' \times 10'' = 80 \text{ sq. in.} \\ \text{in.} \times 2 = 160 \text{ sq. in.} \\ 2 \text{ sides } 10'' \times 16'' = 160 \text{ sq. in.} \\ \text{in.} \times 2 = 320 \text{ sq. in.} \\ \text{Total } 736 \text{ sq. in.} \\ \quad \quad \quad 5.1 \text{ sq. ft.} \\ 144) \overline{736} \end{array}$$

$$\begin{array}{l} \text{Watts} = 4 \times \text{Area} \\ \text{Watts} = 4 \times 5.1 \\ \text{Watts} = 20.4 \end{array}$$

Heater requirements are proportional to temperature over ambient so therefore a 40 watt heater in this aquarium would raise the temperature 24 degrees over room temperature or a 10 watt heater would raise it 6 degrees over ambient.

- (b) Many times we would like to know how warm our aquarium will get with a heater of some given size. This can be calculated using this formula:

$$\text{Temperature} = 3 \times \text{heater watts}$$

$$\text{Area (total in sq. ft.)}$$

For example: How warm will an aquarium get if it has a total area (all six sides) of 9 sq. ft. and is heated with a 50 watt heater which is left on constantly through thermostat failure. Room temperature is 74°F.

$$\text{Temperature} = 3 \times \text{Watts}$$

$$\begin{array}{r} \text{Area} \\ = 3 \times 50 \\ \hline 9 \\ = 150 \\ \hline 9 \\ = 16.7 \text{ degrees} \\ \text{fahrenheit} \end{array}$$

$$\text{Room temp.} = 74^\circ$$

$$\begin{array}{r} + \\ \text{Heater effect} = 16.7^\circ \\ \hline \end{array}$$

$$90.7^\circ \text{ degrees}$$

Aquarium heaters can be purchased in many sizes and forms and the writer does not propose to recommend one type over another. It is generally con-



ceded that unless water agitation in the form of air or a filter is present, it is more desirable to heat aquariums nearer the bottom so that convection currents are set up which will help prevent temperature stratification.

It is generally possible to purchase a heater with a capacity somewhere near the calculated value. However, the writer has for many years constructed his own aquarium heaters using the "Bleeder" resistors, available in all radio supply houses, as heating elements. These units are manufactured in all sizes and are rated by resistance and also a dissipation factor given in watts. This last figure is for the radio man who must know how much power the resistor will dissipate before burning up. When used as aquarium heating units these resistors are inserted in test tubes which are then filled with sand and under these conditions they will dissipate at least twice their normal amount of power.

Let us assume that we need a 30 watt heater. The following formula is used to calculate the resistance if the heater is to be used on normal house current (115 volts) (See Note No. 1).

$$\text{Resistance} = \frac{13,225}{\text{Watts}}$$

$$\text{Resistance} = \frac{13,225}{30}$$

$$\text{Resistance} = 440.8 \text{ ohms.}$$

The nearest standard value to this calculated value should be purchased. In view of the fact that this will be a 30 watt heater, we should purchase a resistor of at least 15 watts dissipation factor. A 10 watt resistor would do the same job, but its life would be greatly shortened.

Needless to say, no aquarium heater

should be operated when not submerged in water.

Note #1—To calculate heater resistance for voltages other than 115 volts, use  
$$R = \frac{E^2}{W}$$

---

### *How To Be Free Of Surface Aquatic Insects*

It may sound a little odd to suggest that the way to eliminate insects in an aquarium or outdoor pool is to *add more* insects, but such is the case. The common water strider (GERRIDAE) found "skating" around the surface of most ponds and lakes are ravenous eaters of mosquitos, aphids and possibly spring-tails—and of themselves.

If a few of these insects are placed on a pool or aquarium, all insect pests will dwindle and disappear in short order. Then, when all other insects have been devoured, they will turn on each other, finally winding up with only one of them. He can be tossed out or kept for sentimental reasons.

Where there are very small fishes present, we do not recommend the use of water striders, as there is some reason to suspect that they may be able to grab off an occasional fry.

A recent correspondent writes that when she moved from one city to another, she did not know how she could possibly take her fishes with her. After much thought she solved the problem by buying a gallon-size thermos jug. With the exception of a few baby Guppies, all arrived at the new home alive. This solution may be welcome advice for fanciers contemplating moving in the near future.

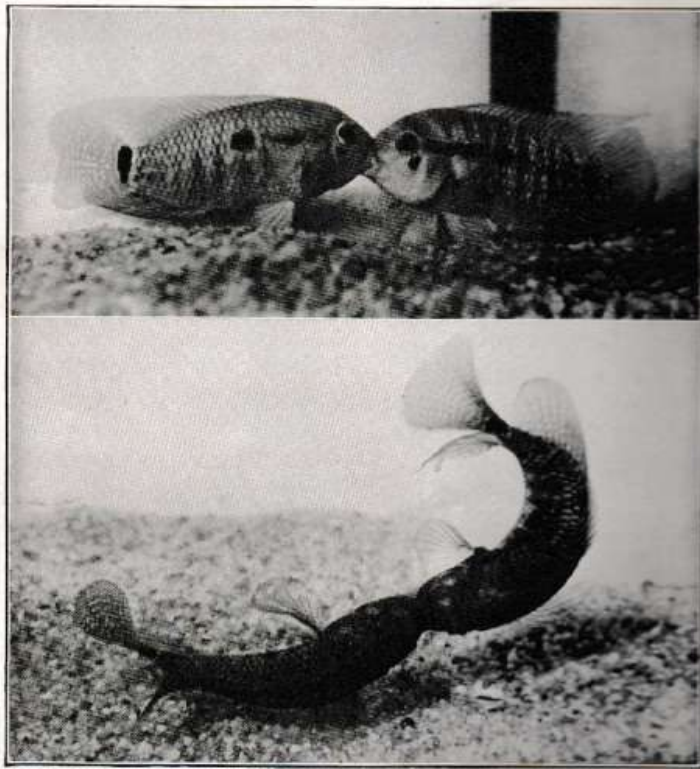
## SPAWNING *AEQUIDENS* *PORTALEGRENSIS*

by Genevieve T. Pfeiffer

IN "EXOTIC AQUARIUM FISHES" by William T. Innes, there is an elaborate spread on one of the more peaceful Cichlids—*Aequidens portalegrensis*, Cichlids—*Aequidens portalegrensis*, known familiarly as "Porties". It is a very detailed article dealing with the loving care the happy parents give their

young, and the accompanying illustration of the "Proud Papa" with a convoy of his offspring is guaranteed to stir the maternal (or paternal) feelings of any aquarist.

It inspired me to such an extent that I felt I simply *had* to have a pair of Porties—I had sampled the live-bearers



PAIR OF *Aequidens portalegrensis* IN TYPICAL COURTSHIP

and the egg-droppers with their sadistic tendencies. Now, I wanted to share in the happy adventures of Portie parenthood and their rituals of spawning.

After much coaxing, my husband finally permitted me to buy an exceptionally fine pair about five inches in length and three inches through the body. They immediately became our favorites and were installed in the largest tank we had, complete with fifteen gallons of properly aged water, clean gravel and a slab of white marble for the eggs. Our optimism was rewarded three weeks later when we discovered a large spawn of approximately four hundred eggs.

Keeping one eye on the eggs, and the other on Mr. Innes' book, we found that everything was going according to schedule. The eggs were fanned constantly, they began vibrating and finally were moved to a depression in the sand, one of many excavated by the parents for this purpose. How helpless those wriggling, awkward fry appeared! Occasionally the parents would hover too close to them, and an accidental flip of their fins would scatter the youngsters all over the bottom of the tank.

Things were going smoothly, but a domestic crisis was pending: Like most young matrons, Mama Portie was extremely solicitous of her offspring. She apparently felt that Papa was not doing his share of the work or else she became too possessive. Whatever the reason, she began nagging him constantly and wouldn't let him have a moment's peace, nipping at his fins and butting him about the tank. Finally, one evening when the babies were just beginning to school with their parents, it happened—the worm turned! We heard a loud splashing in the fish-room and ran in to find Mama, complete with torn fins and missing scales, trying to hide behind the thermostat, while her angry

spouse dashed about the tank, scattering the babies everywhere. With utter disregard for pH or water temperature, we hastily dipped out all the fry into another tank and separated the parents with a sheet of glass. Things became peaceful once more, and we went back to our dinner, now very cold.

Now the fun began! Have you ever noticed how guppies crowd each other at the surface of the water when it's feeding time? They flip out of the water and tumble about, waiting for their daily rations. Then it is a simple matter to shake a little dried food into the tank and forget about them until the next day. Porties, however, are a different proposition, as we soon discovered. They eat constantly—but not dried food, if you please. It has to be alive and kicking—at least, *our* fry felt that way about it. We hatched brine shrimp eggs by the thousands, fed them micro-worms by the millions—*still* they were hungry. Finally, I just hated to go into the room—I could feel all those little reproachful eyes staring at me. It became even worse when our source of brine shrimp eggs failed us—a seasonal slump, they said. We couldn't afford to buy the tiny commercial vials at 50¢ per, we needed the large, economical size for family use! We eventually concocted a mash of strained liver and Pabulum that was acceptable to the spoiled palates of our Porties, and occasionally we fed them shredded earthworms, which we ground up on stainless steel worm shredders imported from England.

Despite all our trials, the babies were growing nicely, and when a dealer friend told us she could use some *Portia*, we happily spent two and one-half hours netting them from the various tanks to which they had been moved as they grew in size. We proudly took them in to the shop—and waited

for the enthusiastic response. The dealer took one look at our pride-and-joy and then, she laughed!

"Oh, they're much too small yet. Come on back here and I'll show you what size I need"—and she pointed to some Gouramis that looked positively enormous.

"They're the size—I'll take as many as you have when they're that big."

I'll admit our spirits were slightly dampened, but we were still game. More tank space—that was the answer! We invested in a 65 gallon tank and set it up on the third floor—with many misgivings on my part. Would the floor hold? Or would I find five hundred pounds of water and Porties floating in my living room some evening? To add to the general confusion, my husband's parents arrived un-announced from Honolulu, to spend part of their vacation with us. I'm sure they never expected to share their bedroom with three hundred-odd Porties!

Did the larger tank help out? Well—for a while it did. However—with the babies growing so fast, even this tank has become too small. Once a week, in order to keep the water from fouling, we siphon out about fifty gallons, and then refill the tank, carrying buckets from the second floor. This isn't work?

The less said about Mama and Papa Portie, the better. We can't stop them from spawning. Being a sentimental person, I hated to see them separated, but every time the partition was removed, they were at it again. Now that I've finally decided to keep them separated permanently—or until I'm ready to raise a new spawn—have they given up? No! Mama tenaciously sticks to her guns and lays eggs on *her* side of the tank every two or three weeks. When they fail to hatch, she then con-

sumes them. This seems cold-hearted, but it's a better solution than feeding the babies to larger fish, which is something I never could do.

You've probably heard people talk of the things they plan to do "when the children have grown up." Just the other day we decided with relief, that some of our original babies, now six months old, were of a good saleable size. We had proof of it this morning—while making our feeding round of our twenty tanks, we discovered to our dismay, that Porties *don't* have to be several years old before they spawn! In one of our twenty-gallon tanks containing a dozen "babies" of the original brood and about thirty-five others of another group, we saw that one pair of Porties had cleaned a space in the gravel about the size of a half-dollar, and filled it with eggs. There they were, staunchly defending their home front, while the other occupants of the tank milled about them. . . that is, with the exception of another pair at the rear of the tank, also setting up housekeeping for themselves!

Anyone know where I can get hold of a portable swimming pool at a reasonable price? That is, large enough to accommodate *Aequidens portalegrensis* of a yet indeterminate number.

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Inbreeding itself does not weaken a strain. It concentrates or accentuates characteristics. If a weakness or deformity is present in closely related breeders, those undesirable traits will likely be passed on to the young. If only robust fishes are used for breeding, robust offspring may be expected.

## THE AMAZON SWORD PLANT, *ECHINODORUS INTERMEDIUS*

by *Walter Bertholdt*



A PERFECT AMAZON SWORD PLANT

**A**MONG the great number of aquatic plants there are comparatively few which catch the eye by their thrilling and gorgeous beauty.

The Amazon Sword Plant is one of them. I remember very well the day when I first saw this plant; it was at an aquarium show in Germany before the last war. There stood one of the winning show tanks. It was late afternoon and that aquarium got the last full rays of the sun. A large number of aquarists were standing in front of the tank, debating the extraordinary beauty of a new aquatic introduction. And it was new for me too. I had heard of that plant before, when it was first

imported into the United States in 1937. One year later it had first come Germany.

Well there we were standing and admiring a picture of really luxuriant tropical scenery. It was a tank of about 35 gallons capacity. The whole center of the receptacle was filled out by an enormous aquatic with sappy and shining green lace-shaped leaves, which reached the surface of the water. The sunrays were giving the plant an extraordinary color effect of almost plastic beauty.

After this enthusiastic introduction let us come to the point and discuss the conditions under which the plant will

prosper and can be propagated. Right at the beginning I would stress the fact that *Echinodorus intermedius* can be classified as a problem plant. Strange as it seems, we have here an aquatic which under apparently identical conditions reacts in different ways. The main difficulty is to make young plants grow when being freshly transplanted.

Just a few examples to illustrate this. I remember that we had ordered for our aquarium society about a dozen young Amazon Sword Plant layers, which were about 3 inches high. They all were healthy young plants and were distributed to the different aquarist members of our club. I could now watch the development of the young plants exactly, because two of my friends and I visited each other regularly, exchanging aquarium experiences.

At that time we did not pay much attention to hard and soft water and to the pH value. But our tanks, in which we had planted the new runners had the same well-aged tap water of about 10 degrees of hardness (German degrees of hardness). In other words it was slightly hard water. The pH value was 7 (neutral.) We had gravel in our tanks without any earthen or loamy sublayer. All three aquaria received moderate day light and were artificially lighted by normal electric bulbs about twelve hours daily.

Now we waited for the development of our new Amazons. One of my friends had good luck. A week after being brought in his plant developed a fresh green shoot, and further ones grew every 6—8 days, on an average of one every week, each one becoming larger than the preceding one.

But my second friend and I had bad luck. We waited in vain for the prospering of our runners. My second friend

finally gave up. After having waited about 6 weeks I transferred the young plant to a 5-gallon tank which received rather weak daylight, but in compensation good artificial light by a 25-Watt normal electric light about 8 hours daily. But here too I had practically no success. Though I kept the runner for half a year in that receptacle, it had only developed two poor new leaves.

But encouraged by the good luck of my first friend, I made further experimentation. Now I moved the "Sorrow-Child" to a 4-gallon tank with very shallow water of only 6 inches height. This aquarium received abundant daylight and about 5 hours of sunshine daily; no artificial light. Even though I kept the plant for 3 months in that receptacle it did not develop.

Now I decided for a last experiment. I put the layer in a large 40-gallon tank which was situated in a north room with very poor daylight and moderate 12 hour artificial illumination by normal electric bulbs. And now finally it began to flourish. In this tank too the water was the same as before; tap water well aged, about 10 degrees of hardness (10° DH), pH neutral.

In this tank my Amazon began to make up for lost time. Every 5 days a new leaf developed, until after a magnificent growth of 3 months I counted about 20 strong and healthy leaves, each 1½" wide and 20" long. Six months later I had a masterpiece of Amazon in my tank, consisting of 50 superb leaves of varying shades, but the bright green color dominating. The center leaves were of almost translucent color. All the leaves were green, and not a single one showing signs of decay.

And here are the further notes of the conditions in that tank: Temperature 70—75 degrees. Medium coarse pure

gravel of 3 millimeter graining (3/16-1/8" grains). Gravel contained a bit of lime. No earthen or loamy sublayer was used, but the sand was well saturated with fish and snail droppings thus providing an excellent natural fertilizer. That gravel was in the tank for about three years without being renewed. No droppings were syphoned off, because the tank was richly planted and the droppings of fish and snails were absorbed by the gravel and the roots of the plants.

But now back to our Amazon Sword Plant in my 40-gallon tank. One day my plant began to develop a free-reaching runner which was growing rapidly toward the water surface and finally reached a length of 35 inches. On this "stem" new plants began to develop. The runner was laid to the ground in a big semi-circle round the mother plant and weighed down by small pebbles. To my greatest joy the tiny little new plants began to root comparatively quickly and nice Baby Amazons developed.

The first "stem" grew five young Amazon Swords, which little by little became healthy new plants. Then a second runner developed, which also was laid down as described above. This stem grew 6 new Amazons. Meanwhile I had a very nice collection of Amazons in my tank, which prospered so splendidly that little by little I had to take out the other aquatics in the tank to get new room for the "Amazon-mother with her children."

Finally 4 stems with each one bearing new plants had grown and still the mother plant was in best condition. In the meantime many of the "babies" after having reached a height of about 4 inches had become well rooted and were severed from the parent plant. These were given to my fellow aquarists.

Since that time I have constantly had several *Echinodorus intermedius* in my tanks and have been cultivating the plant under various conditions. The result of thorough investigation and exchange of experience with my aquarium friends was in brief as follows:

The Amazon Sword Plant prospers both in soft and medium hard water of 1—10 degrees of hardness. I have also kept it in pure rain water of 1° DH with the best possible success, recently. In hard water of more than 10 up to 15° DH it also grows, but not so well. But propagation in hard water was impossible in our aquarium circle. In very hard water of more than 18° DH cultivation proved impossible.

Amazons have very big roots and consequently absorb a lot of nutrient salts from the ground. Though I personally never use any earthen or loamy sublayer, such ground can be used under a good layer of pure medium coarse gravel. I have obtained the best results in gravel free of lime, though a bit of lime in the ground does not do any harm. In ground with much lime propagation proved impossible.

In case the ground is not well saturated with fish and snail droppings, occasional doses of a good plant fertilizer are recommended, because the Amazon under ideal conditions is a very fast grower and consequently needs much nourishment. Besides plant fertilizer tablets, well dried and powdered cow manure, mixed between the gravel (the lower layers only) when setting up the tank afresh, proved most successful and obtained very rich growth.

Regarding pH, the plant does best between 6.5 and 7. Alkaline water cannot be recommended. The plant needs moderate-bright light which should not be too powerful. Both artificial light, or bright day light will do. For best

effect the light should come from the front and top with a dark background.

Temperature range is from 70—85 degrees. Ideal are 73—77°, lowest temperature 68°.

The Amazon Sword plant needs large tanks of at least 15 gallons for prospering. The bigger the aquarium the better it will do. Small tanks are absolutely unsuitable for the plant.

When buying new plants try to obtain one of 4—5" height. Smaller layers need too long a time for getting rooted and well established, but older plants are also unsuitable for being transplanted.

In conclusion I would mention that the Amazon is an aquatic which presents some difficulties for the discriminating aquarist, and often some obstacles in their successful propagation have to be overcome. But when following the directions given in this contribution, the maximum changes for good propagation are given. Once a young Amazon gets firmly rooted in a new tank it will generally flourish for years. It is an ideal center piece in a big show tank.

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*Who Has These  
Champion Goldfish  
We Have Been Hearing About?*

During the past year or two many rumors have come our way about the numerous fancy Calicos, Moors, Lionheads, Orandas and Celestials that are being both imported and bred. There is considerable interest both here and abroad in fancy Goldfish, and by "fancy" we mean show fishes of championship calibre that point up to an

average of 95 to 100% by standard comparison charts. For this reason it would be very much to the interest of the hobbyists in general if they could see for themselves some of the very top quality fishes in existence today.

But—fanciers in the United States who have such fishes are loath to make themselves and their fishes known, or on the other hand it may be that they simply have not had an opportunity up until now to become known to the hobby in general.

It is also a fact that good fishes are few and far between. Thus it is felt that some of the really good ones should be photographed and brought to the attention of the public, not only as a matter of general interest, but as a definite method of visualizing the best types in existence, so that all hobbyists will know what to look for in the way of championship stock, and have definite points toward which to breed if they have ambitions in this direction.

As a starting point—"The Aquarium" will be interested in publishing good photographs of advanced types of Goldfishes along with details of their breeding and rearing. Breeders, hobbyists and specialists who have top quality fishes are invited to contact us with good photographs and descriptions of their best fishes. The publication of such information is considered a direct service to the hobby, and we will be pleased to cooperate fully in every way we can in order to bring these beautiful fishes into their well deserved popularity.

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While some fishes are decidedly solitary, most prefer company. It has been noticed that many fishes are more lively, more colorful and have better appetites when they are kept in groups of their own kind.



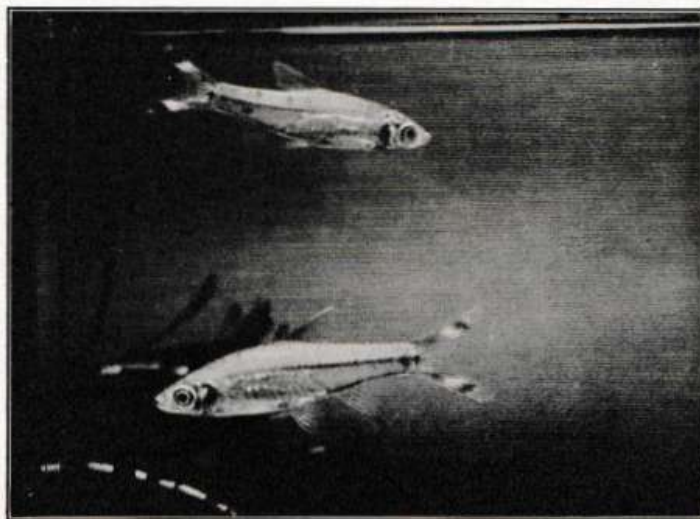
## *RASBORA TRILINEATA* THE SCISSORS-TAIL

THIS GRACEFUL FISH has recently been appearing in considerable quantity in fish stores, but it has received little or no attention from aquarium publications.

*R. trilineata* is the largest of the commonly seen aquarium Rasboras, at-

tion mislead the reader, let us point out here that in an aquarium with several of its own kind, it is a very attractive species. Color alone does not constitute fish beauty.

From time to time reports of spawning have come to us, but always they



*Rasbora trilineata* STEINDACHNER

taining a length of 8 inches, but aquarium specimens more often average about 3 inches. The fish almost completely lacks color, its body being a sort of transparent "fish" color, but it redeems itself with its slender body, graceful movements and its long, sharply forked tail which gives it its common name. The tail, too, has the fish's only trace of color, orange and black bars. Lest the preceding descrip-

tion have been noticed after the fry have hatched. We have never had a good account of spawning conditions or spawning procedure. It seems likely that someone is breeding the species in quantity, as there are so many on the market. The fish apparently does not need high breeding temperatures, and does not eat fry if it is well fed.

A native of Malaya.

## *The* EDITOR'S LETTER

### *How Long Can Fishes Fast?*

A recent letter from one of our most avid readers, Miss Cynthia Gay Lang, of Brooklyn, brings up a point in aquarium lore which, to my knowledge, has never been made the subject of organized study, although various vague ideas on it exist.

The substance of the letter is that after a two weeks vacation Miss Lang was agreeably surprised to find her unattended and unfed fishes in fine condition. A few of her plants had been nibbled. This was the only evidence of any food having been taken. All fishes were accounted for, so there was no cannibalism. Also it could be added that fishes beyond the baby stage do not, as is sometimes supposed, get any nutrition from microscopic life in the water.

The plain fact seems to be that most fishes, if fairly plump to start with, can go for a long time without food. A two-weeks fast is only a trifle, hard as it may be for the devoted aquarist to realize, especially as his fishes seem to be perpetually hungry.

The subject not being properly covered in any known book, correspondents occasionally write wanting to know what to do with their fishes during a long vacation, no substitute caretaker being available. My usual answer is to feed them substantially, but not excessively, for a few days in advance, keep them cool and covered to prevent too much evaporation (if the absence is to be long). The presence of soft, slightly edible plants, such as *Anacharis*, helps.

I confess to feeling remiss in not being able to state even an approximate length of time through which fishes can fast. Some extraordinary cases have been reliably reported, two of them in these columns. The late J. L. Troemner had a fish jump from an aquarium into a quart jar, where it remained unnoticed, (and alive) for about 6 months.

A Virginia aquarist on entering the military service gave his mother instructions for tending his tank of mixed fishes in the basement of his home. The electric aquarium light burned out soon after he left. The lady thought the fishes must be dead, and paid no further attention. The soldier came home on furlough in about four months, if I remember rightly, and the fish were alive but a little thin. If any had died, they had no doubt served as some food for the others.

Such extreme cases need not fix a standard pattern as to what our fishes can stand, but some reasonably accurate knowledge on the subject would be desirable.

Personally I am going to harden my heart, and, with several types of fishes, keep a few of them without food until they commence to look emaciated, no matter how long it takes. I would appreciate it if some of my readers would do the same, and let me know the results. Then we can publish the experiences and thus come to conclusions of value. These experiments should be conducted under healthy, normal conditions on fishes of different types and ages. Also with and without plants present.

Terrestrial animals can go without food a fairly long time, even those that do not hibernate, but not without water. Fishes have the advantage of not drying out, which no doubt accounts for their apparent ability to fast longer.

It is my intention to include both live-bearers and egg-layers. This might be a little hard on the few fishes used in the experiment, but in the long run it could furnish sound information to aquarists having to decide whether, in their absence, to leave fishes without food, or to the tender mercies of an inexperienced caretaker who is liable to kill them with kindness.

I will appreciate it if those undertaking this research will advise me in the beginning, so that we can keep in touch with each other.

*Sincerely yours,*

*M. T. Jones*

# THE GREATEST KILLER OF THEM ALL

by C. E. C. Cole

Hford, Essex, England

IT IS MANY YEARS now since my attention was first called to the greatest killer of goldfish fry, and every season since I have heard the same lamentable story from numerous goldfish breeders—whole spawnings of most promising fry wiped out in a week or two.

In every case the cause was the same—devastating attacks by a small flat-worm—*Dactylogyrus*. The life cycle of this ecto-parasite has been traced through all its stages, and a cure which is as certain as any can be has been tested time and time again. So successful was its persistent application that before I had completed my study of the creature I was forced to appeal and rely upon other aquarists to provide me with infected fishes.

The story of the parasite, how it gets among the fry, and the method adopted to destroy it is given below in the hope that this most serious menace to our goldfish stocks will be stamped out once and for all.

A fully grown *Dactylogyrus* is just over one millimetre in length, and it has been definitely established that an adult fish can carry quite a number upon or in its gill membranes and throat region without any apparent discomfort. The presence of "Dacto" is one of the reasons—often completely unsuspected—that fishes scrape themselves along sand and rocks.

Their efforts to dislodge the creatures are unavailing, however, for the para-

sites are equipped at their rear end with two very sharp hooks, and a number of retractible hooklets, which help them to maintain a very firm hold on their victims.

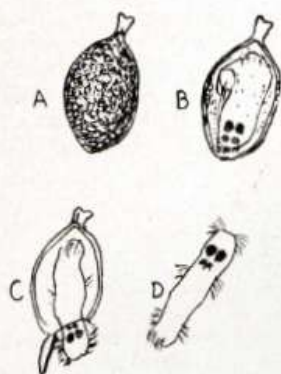
Infected fishes are not prevented from coming into breeding condition, and without giving them any remedial treatment at all, most aquarists allow the fishes to spawn as freely and as often as they feel disposed. If this is done, trouble will most certainly follow with the regularity of clockwork, and spawning after spawning will be decimated.

And yet the worms remain attached to the parent fishes, and are removed from the proximity of the eggs. How can this be—it is impossible?

But it isn't—the worms lay eggs, at the rate of one every seven to ten minutes, and the eggs drop into the spawning tank with the fish eggs. So small are they (about one tenth of a millimetre) that they are completely invisible to the unaided human eye. Under the microscope they are revealed, however, as transparent-shelled, filled with brownish-yellow yolk, and of a surprisingly consistent shape. I have watched the worms laying them many times, timing the operation as a matter of interest.

So now we have both kinds of eggs laid—the *Dactylogyrus*' and the goldfishes'. Development of both proceeds at the same rate, so that at the moment the first fry breaks out of its shell, the first parasite is struggling to do likewise.

Once out of the egg the advantage lies with the larval worm, no bigger than an infusorian, and equipped with lateral, terminal, and dorsal tufts of swimming hairs. It is completely transparent, and can be detected only by trained eyes. The only feature which is at all conspicuous is the two pairs



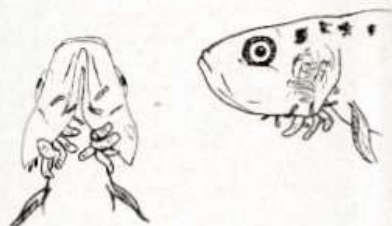
A. EGG                      B. WELL ADVANCED EMBRYO  
C. HATCHING              D. LARVAL WORM

of comparatively large black eyes round its mouth.

Moving at about the speed of a paramecium, it cruises round in a seemingly aimless manner. Then, so fast that the eye can barely follow, it makes an even more erratic dash. Sooner or later it finds a host—one or other of the helpless little fry, clinging precariously to weed, stone, or the meniscus of the water, waiting patiently for its egg sac to be absorbed.

The worm may land anywhere on the fish—its head, its tail, or its body—but wherever it arrives, it has only one destination in view: the gill membranes and the throat of its intended victim. Gradually it will work its way towards this part of the fry, and once there, it digs in with its developing hooks and hooklets, and proceeds to pick away at the membranes, soon to be joined by another worm, and another.

At this early stage the fry does not appear to suffer much from its unwelcome visitors, but as they grow it finds increasing difficulty in operating its gills, until at about a fortnight old this becomes almost impossible. The young worms are now old enough to themselves lay eggs, and may be seen



A. HEAD OF INFESTED FRY (from below)  
B. HEAD OF INFESTED FRY (from side)

quite easily by the naked eye protruding from the gills and throat of the alevins, looking like minute pieces of cotton, or Mikro worms wedged in the gill clefts.

Death in the vast number of cases



DACTYLOGYRUS

is inevitable. It is only where the infestation is slight that there is a chance of recovery. Death is by drowning, and not, as I once thought, because of damage to the gills themselves, which upon examination show comparatively little signs of the worms' attentions.

Even after the death of their hosts the worms do not release their hold. As they have lost the power to swim, they too are now doomed to die, and spend their last few hours laying eggs to ensure the continuance of their species.

It is very unusual for an egg to be infertile. During the whole of my experiments I found only one or two which did not develop into larval worms.

Temperature has a marked effect upon the development, however. Newly laid eggs placed in a refrigerator remained dormant until brought into room temperatures again. Partly developed eggs placed in a refrigerator often failed to hatch after bringing out again.

Eggs kept in the dark in normal temperatures were slower in developing, but none the less sure.

It has been established that during the cold winter months, in outdoor pond or unheated aquarium, no larval worms hatch, but when the water reaches the neighborhood of fifty-eight degrees Fahrenheit, they begin to develop once more. First-hatched find the large fishes and colonize on them, ready to spoil another breeding season for the careless or unwary aquarist.

A short cut to freedom from *Dactylogyrids*, therefore, is to rid the breeding fish of them before spawning them. This can be done quite successfully if the following directions are carefully followed.

Obtain a small quantity of powdered

permanganate of potash. Add one quarter-teaspoon measure of this to 140 tablespoonsfull of fresh water, making certain that all the permanganate is dissolved, and transferring to a tightly stoppered container. Catch the breeding fish and place them in an aquarium, previously thoroughly scrubbed and filled with fresh water. Now add one tablespoon of stock solution to each gallon of water in the aquarium, and permit the fishes to swim freely about in it for from three to four hours. This will destroy the majority of the mature worms and any immature ones on the fishes, but will not affect the eggs they have laid during the bath. The strength of the solution will usually stain the fishes a little, but this will soon disappear. Repeat the bath within a week—in another freshly prepared aquarium.

Larval worms will live about four to five days if they are unable to find a host, so that if all fishes are removed from suspect tanks, the temperature of the water in the tanks can be raised to say, 65 degrees to encourage the hatching of any eggs there may be. Maintain at 65 for a minimum of ten days to ensure the destruction of all larval worms.

In spite of treatment it may be that one or two worms or eggs will escape destruction, and these in time will surely start another severe infestation. Careful watch should be maintained and as soon as signs of a fresh attack are seen remedial measures should be rigorously applied.

A final word of caution: do, please, treat all new arrivals for your stock with suspicion. Never let untreated specimens run with clean stock. They may be all right, but on the other hand, they may not. Only by constant vigilance can the havoc wrought by *Dactylogyrids* be reduced and finally eliminated.

## REVOLUTIONARY DEVELOPMENT FOR FISH SHIPPERS

by Alan M. Fletcher

**T**HE NEED of fishes for a rather large quantity of water per fish while in transit is a problem that has not plagued the tropical fish industry alone. Game fish growers have long labored under the burden of handling huge quantities of shipping water.

The problem is bad enough when we consider the large trucks and expensive aerating equipment needed for game fish stocking. But when we realize the fact that much stocking is done by small aircraft and the backs of men (in completely inaccessible areas), we are inclined to be utterly amazed at the unsung heroes of the angling sport.

One of these heroes, Al Reese, senior warden-pilot for the California Department of Fish and Game, decided to do something about the situation. With the aid of a pharmacist friend, Reese experimented with the use of various types of drugs on fishes. After a dozen tries during months of experiments, the field was narrowed down to sodium amytal, one of the barbituates commonly used in human medicine. The drug slows down the metabolism of animals and thereby cuts their oxygen consumption.

With the use of this drug, the California Department has been able to increase the normal fish capacity of a container by from 2 to 5 times. The most satisfactory amount of the drug has proved to be one-half grain per gallon of shipping water. This year the Californians will ship more than 3½ million fish under the influence of sodium amytal.

The drug is perfectly harmless to the fishes. When released in fresh water, they swim away immediately. In most cases, Reese has observed that the fishes are actually in better than usual condition because the "slowing" effect of sodium amytal means less dashing around in the container and therefore less injury to them.

As an experiment, the writer placed five guppies in a pint jar nearly full of sodium amytal-treated water. The top was sealed tightly. Sentiment would not permit carrying the test to the bitter end, so after a week the fish were returned to their aquarium, normal in every way. How long they would have lived in the jar is anyone's guess. An adult female Betta was placed in an uncovered gallon jar of the same treated water. For a week it hardly moved from the bottom of the jar, but today it is merrily swimming in a community tank. These simple tests seem at least to indicate that although tropical fishes are slowed down considerably by sodium amytal, there is no harm done.

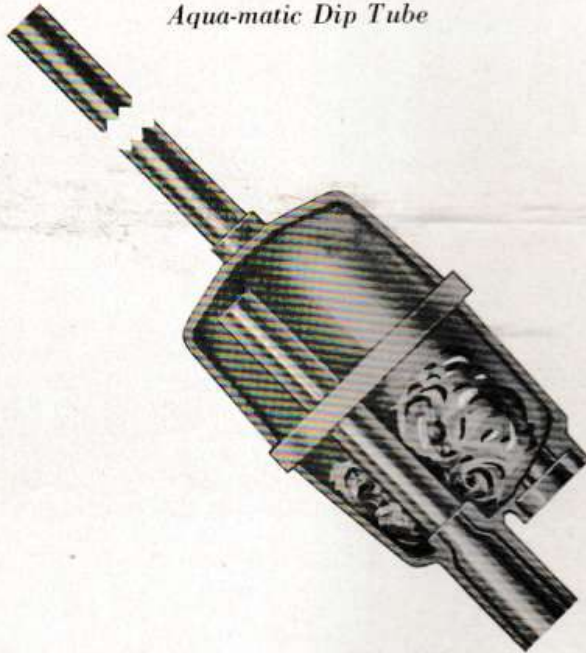
Need we urge fish shippers to do some experimenting of their own with this drug? Imagine the benefits of being able to carry from 2 to 5 times more fishes in a single shipment! We would like to hear from shippers who will try sodium amytal, at least experimentally.

The drug is available in drug stores, by prescription only. However, most commercial fish men will have a pharmacist or physician friend who would be willing to work with them.

# AQUARIUM GADGETS

*Ninety-nine Of A Series Of Articles*

## *Aqua-matic Dip Tube*



The hand dip tube has long been a basic piece of equipment for the aquarist. It has no parts to wear out, it needs no air pump to run it. It is a complete, ready-to-use unit in itself. The one bad feature of the ordinary hand dip tube has been that each time it is filled with water, it must be emptied by hand or taken apart to remove the sediment.

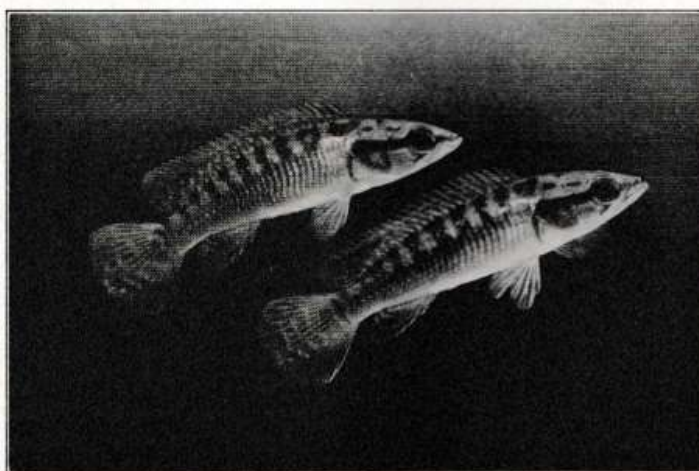
Now, Precision-Bilt Products Co., Brooklyn, N. Y. (see back cover) has come out with a dip tube that has a continuous action. The Aqua-matic Dip tube is filled with sediment and water, then lifted above the surface. Then, because of a valve at the base of the

tube and a small piece of glass wool, the water returns to the aquarium, leaving the sediment behind. When the water has drained out, the tube is again ready for further work. This filling and draining action may be continued for some time before the glass wool needs changing. An added feature of this dip tube is that because of a carefully calibrated hole at the base of the long stem, the water enters at a controlled speed, giving it several times longer action than most other dip tubes.

Altogether, the Aqua-matic Dip Tube is a handy piece of equipment for the aquarist, regardless of how meager or extensive his layout.



## THE PIKE CICHLID, A BAD ACTOR



**T**HERE ARE a number of fishes that are of interest to aquarists, in spite of certain anti-social characteristics—usually cannibalism. The Pike Cichlid, *Crenicichla lepidota*, is one of these personalities. Its common name no doubt comes from its long, pike-like shape, but its personality also approximates the Pike, a vicious game fish.

Knowing these characteristics, the aquarist need not scorn such a fish. It has much charm and personality. All it asks for is a tank with only its own kind.

Breeding is in typical Cichlid fash-

ion, except that the male cares for the young. According to Innes' "Exotic Aquarium Fishes," the father is a stern disciplinarian. If a youngster strays from the fold, it pays with its life!

Coloring is attractive in a quiet way. The anal and tail fins are shaded with red, while the other fins are covered with little gray dots. Variable dark bars on the back are the only distinctive body markings. The females have larger dorsal and anal fins than the males.

Prefers temperatures in the seventies. Native of South America.

# PLANTING YOUR AQUARIUM

by 2nd Lt. F. R. Buckley, U. S. A. F.

(No. 2 of a Series)

LAST MONTH, as you may remember with a jaundiced eye, we discussed the most desirable tank, a square, squat object free of unnatural ornamentation. One felt it perhaps brash and dogmatic to disqualify from consideration aquariums under 50 gallons, since so few of us are able to purchase such a tank, and since even those of us who own a tank of this capacity are told it will not do because of the lack of width in its dimensions.

I was, of course, speaking of the perfect, dream tank. But the principles of planting argued below will apply to all aquariums, whatever the size.

It is best to use no more than one type of plant in small aquariums. If, for example, one fills the tank with pygmy sword plants and cabomba, the initial neat appearance will soon give way to a tangled confusion, as the little chain plant extends its ubiquitous tendrils, entwines with the drooping leaders of the cabomba, climbs up the sides and runs across the top, and in general creates a havoc which resembles the backlash on a fisherman's reel. It can be controlled by constant pruning, but this is upsetting to the fish in a small aquarium. The unattractive, free-floating "chains" of such plants are supposed to be placed "just below the surface of the bed." This is an euphemism, an attempt often tried and seldom succeeded in. In any case, most plants insist on encroaching the areas of other plants, and vice versa. Without continual attention, all semblance of order

vanishes. And two different types of plant seem somehow unnatural in the constricted space of an 8- or 10-gallon aquarium.

My suggestion for such tanks would be a solid block of *Vallisneria* with one centerpiece of *C. willisii*. This centerpiece should not be in the center at all, but should be placed somewhat to the right, separated from the *Vallisneria* by a small clearing and a few pleasing rocks. Such conformation is artistic. You will notice it in all good paintings.

When we reach the 20-gallon class, two different groves can be managed. One of the most striking arrangements is achieved by the use of *Vallisneria* and *C. beckettii*. On the right, raise the ground level by an inch or two. Surround this plateau, which should cover a space of 5 inches by 6 inches, with a ballustrade of rocks. Plant your *becketti*. Then, smother the surrounding valley with *Vallisneria*. You will be most satisfied with this basic aqua scape, since it offers any number of variations.

This brings us to the classic 50-gallon tank built to stocky dimensions. The possibilities of such an aquarium are infinite, but I will describe only the one fundamental design as outlined in the last article. We had built a high plateau on the left, some ten inches by ten inches. The base of the cliff we kept clear, with only the shoulders of a few rocks protruding. Plant this plateau with the Pygmy Chain Sword Plant. Its pesky habit of poaching on restricted areas can easily be controlled by simply

snipping off the tendrils as they drop down the cliff. Allow them to fall so long as they do not bud new plants. Pruned in this manner, the overflow produces graceful lines.

Three inches from the base, insert a few *C. beckettii*, following the semi-circular contour of the plateau. When you have a grove of these wiry plants established, bed a group of *C. cordata*. Follow this grove with *C. willisii*.

You now should have completed the planting of half your tank. Leave the rest of it bare until you are sure the pattern is firm. This will require some effort on your part with a pair of scissors, but you will not regret it.

Now cover all but a 5x5-inch circle in the right front of your aquarium with a thick forest of Giant Sagittaria. This is the king of aquatics. Nothing can compare with a forest of these sturdy plants, waving softly in the wake of a fish. The bare circle on the right is reserved for a vigorous Amazon Sword Plant. It will prove an attractive balance to its little relatives on the plateau.

A nice touch which may be added to this aquarium of surpassing beauty is the cutting of a narrow avenue through the Sagittaria, from front to rear. In the very rear, clear out a globular square. Place on this plaza a flat rock, so that no plant will take root. Many fishes will resort to the peaceful haven, and as they pass in front of the opening created by your narrow cut, you will get fascinating glimpses of your fishes in repose.

The three designs which I have sketched are meant as basic guides. I would guard against a profusion of differing species. Such an admixture usually results in a messy appearance, particularly in the smaller aquariums. Simplicity is the key to all beauty, say

the masters of art, music and literature. This axiom is pertinent to the planting of aquariums.

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### Getting The Most Out Of Your Filter

Most aquarists get only a small portion of the possible use out of their filters. Scattergood Filters, of 502 W. Lehigh Ave, Philadelphia, has printed a ten-page authoritative pamphlet with the above title. It should be read by all aquarists. As one can imagine, at the end of ten pages, little has been left unsaid about filters.

"Getting The Most Out Of Your Filter" is decidedly an advertising device, but the writer has conscientiously included a wealth of information that is of great value to aquarists, regardless of what brand filter they own.

A run-down of section titles will give an idea of the valuable information in the booklet:

The Sanitary Aquarium  
The Purpose Of The Aquarium Filter  
The Best Way To Set Up Your Outside Filter—Filtering Material  
Backwashing—The Easiest Way To Clean Your Filter  
Don't Clean Your Filter Too Frequently—When To Clean It  
Reactivating Activated Charcoal  
Cleaning Filter Stems And Tanks  
How A Filter Aerates—The Speed To Run A Filter  
Filtering Two Aquariums With One Filter  
Clearing A Cloudy Aquarium  
Filter Heating  
Inside VS Outside Filters  
Concealing A Self-adjusting Siphon  
Air Pump And Air Valve Installation

The Pamphlet is free for the asking and is available in quantity to dealers selling Scattergood products.

# INSULATED FISH CABINET

by G. Bishop

Portsmouth, England

THE GENERAL INCREASE in electricity charges set us thinking about tank insulation. The idea was to provide an insulated cabinet to house two tanks,—and would also look decorative.

The basic idea will appeal to aquarists who cannot have a fish house but wish to have a community tank and also one for breeding. In my own case the top tank is the showpiece and the lower one is used for breeding. This of course can be divided into two or more compartments by using glass partitions.

Not being at all clever at woodwork and not having a workshop with lighting available, the idea, had of necessity, to be simple and was actually completed—with the co-operation of "Mother"—in the drawing room. The cabinet holds two tanks 24 in. by 12 in. by 12 in. but of course the measurements can be adapted for any size tanks.

Heating is by 100 watt heaters, one in each tank, controlled by a thermostat in the top tank, temperature in the top tank is a few degrees higher than the lower one.

Various alternatives can be adapted to suit materials available. For example, plywood can be used in place of hardboard and in the model shown, insulating board was used because we had some over from another job. Cardboard can be obtained cheaply by carefully cutting old cartons from the grocer.

The front panel is a piece of hardboard, strengthened by pieces of quarter round beading screwed around the sides, and it stands in brackets made of aluminium, supported on screws.

A template should be made of card-

board for the brackets. This saves considerable time and waste of materials. Two small bolts as used in china cabinets hold the panel at the top on the inside.

The bolts are reached through the viewing aperture.

All crosspieces are glued and screwed and a 25-watt bulb is fitted above each tank with polished aluminum reflectors.

The top cover has wood sides with a hardboard top, steamed and bent to shape, and is hinged at the back with a long piano-type hinge and supported when open with a fitting from a phonograph cabinet.

The completed cabinet stained or painted to match the decoration of the room looks attractive and can be made by anyone with a few simple tools.

## Materials Required

Wood;—four pieces 1½ in. by 1¾ in. by 25 in.; main supports, four pieces 1½ in. by 2 in. by 54 in.; for legs, four pieces ½ in. by 1¾ in. by 13 in. side supports, two pieces ½ in. by 11½ in. by 28 in. for shelf cross pieces; one board 6 in. by ¾ in. by 28 in. for back; one board ½ in. by 3 in. by 28 in. for front, two boards ½ in. by 5 in. by 13 in. for sides and one board ¾ in. by 11½ in. by 28 in. for cover.

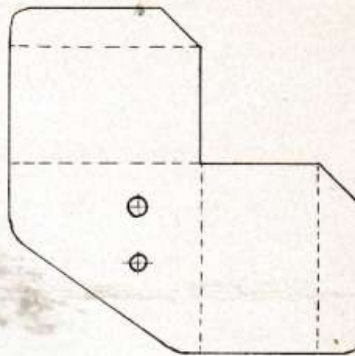
Hardboard, cardboard or insulating board: Hardboard, front 36 in. by 27 in.; shelf 14 in. by 25 in.; top cover 14 in. by 28 in.; two pieces 10 in. by 28 for sides. Cardboard, two pieces 34 in. by 10 in. for inside of sides.

Beading: ¾ round—28 ft. by ½ inch.

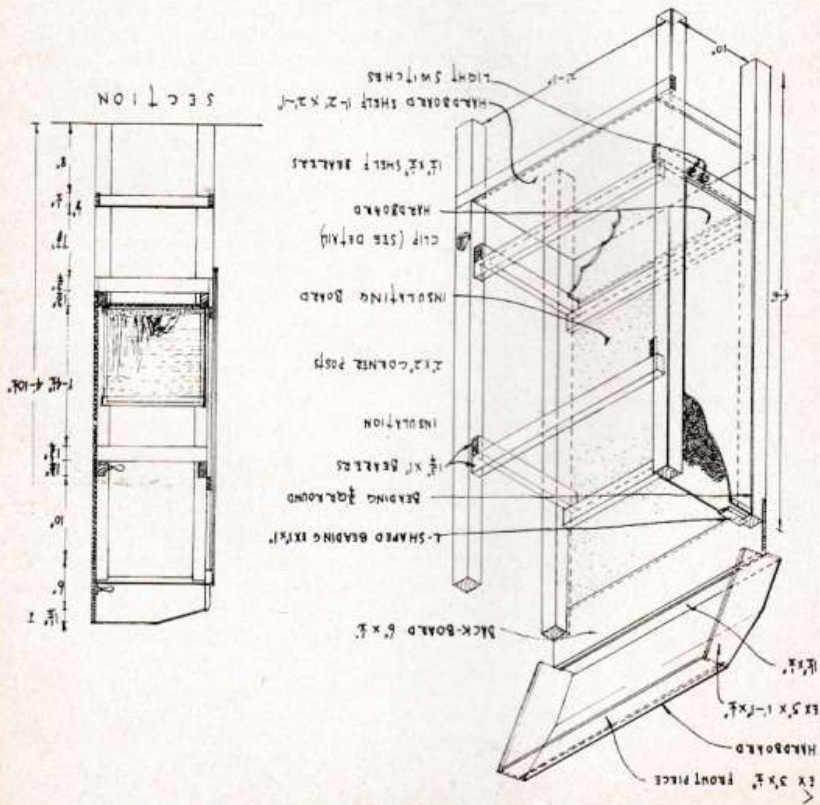
Strengthening for cover: two pieces 31 in. by 11½ in. by ¾ in.; two pieces 22 in. by 11½ in. by ¾ in.

Editor's note: This cabinet project aroused so much interest when it was originally published in the British magazine, "The Aquarist," that the author has offered it to American aquarists through our magazine.

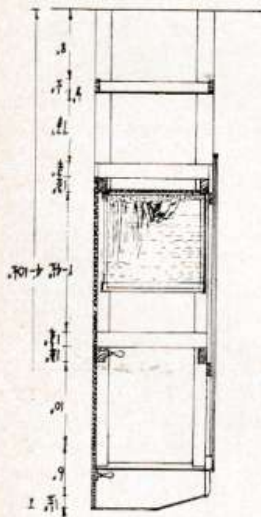
PULL SIZE DETAIL OF CLIP



ISOMETRIC VIEW



SECTION



## "THIS IS MY PROBLEM"



... Please ...



A stamped, self-addressed envelope *must* accompany every letter, as each one is answered personally, regardless of whether it is selected to appear here. Those who fail in this courtesy should not expect a reply.

From: H. J. Oldham, Havana, Cuba.

(1) Do you know anything of a reported new strain of black Guppies from Trinidad? A black and orange breed. If it is possible, it should certainly be a fine looking fish.

(2) We have had rather an amusing experience with *Scalares*. "We have twelve of them in an outdoor pool in the garden—it suits them admirably and they are growing into really large specimens. I remembered that I had read in one of your "Aquariums" that you had seen some fine *Scalares* at the house of one of your friends and that you considered their fine condition was due to the fact that they were fed a steady diet of surplus Guppies. Accordingly, I put half a dozen large Guppy females in our pool and thought that the *Scalares* would have a banquet. It appears, however, that the *Scalares* and the Guppies are the best of friends and our problem now is that the pool is almost overrun with the Guppies—there must be literally hundreds of them and they are increasing daily. It seems hard to believe that the appetites of a dozen large *Scalares* can't keep up with the arrival of new Guppy babies.

ANSWER:

(1) *We have several times heard of "Black Guppies" but have never seen any that were jet black and none with any orange on them. By selective breeding it may be possible to develop a good black.*

(2) *In reference to the Angel Fish getting fed up on baby Guppies, this at first seems surprising, because from the*

*time Angels are as much as 3 months old they grab every baby Guppy they can get. There are a couple of possible explanations. One is that a large fish making a try at catching a small one may miss it. After one or two tries, the aggressor seems to make up its mind that he cannot catch that kind of fish, and will not try again. This has been seen time and time again in aquariums. The other case is that of Guppies in wholesale quantities. The writer raises them by the thousand, all in large trays without any protection for the young. From the tremendous results, it would seem that they are never eaten. This is an old observation as far as crowded Guppies are concerned. Evidently the babies have heard the old axiom "There is safety in numbers."*

\* \* \*

From: E. Berryhill, Baltimore, Md.

Today I visited a local aquarium store, and after viewing the tanks was asked if I were interested in a rare Betta. The owner showed me what was called a "Black Betta." This fish was a very dark blue-black.

What did I see? Can you tell me the genetics of this fish; is it rare; is it worth my time and money to try to spawn?

ANSWER:

*"Black" Bettas are indeed rare, and they bring high prices. Only a few of them are being bred at this time. Under usual conditions they are not really black. The only time they are black is*

at breeding. But even at other times they are beautiful and unusual. The typical color is a very dark brown with a slight metallic blue overcast. We do not have any definite information about the genetics of this strain, but we are quite sure it was created by the simple but time-consuming process of selecting over a period of several years, the darkest colored specimens for breeding. By this method the strain will no doubt be improved also. If you buy this fish with the intention of breeding, be sure to buy a black female also. Many expert aquarists do not know that the female is just as important as the male in passing on characteristics. This applies to all fishes.

\* \* \*

From: W. Goldblum, Brooklyn, N. Y.

On a recent trip to a lake to do some fishing I caught a young eel, about a foot long. Since he was not injured much by the hook, I decided to take him home. I placed him in a five-gallon tank. (1) Is this big enough? (2) What can I feed the eel? (3) Should I have any kind of rocks with him to provide a hiding place? (4) Can other fish be placed with it?

ANSWER:

(1) The eel should have at least 15 gallons. (2) Eels will eat small fishes, and it may be possible to train it to eat raw meat or fish. (3) They appreciate hiding places. We have seen a piece of terra cotta pipe used for this. (4) No other fishes would be safe with the eel, as they are vicious eaters.

\* \* \*

From: Helen Gallucci, New York City

I have been told that the insertion of a few copper pennies or a strip of copper will, to a certain extent, alleviate the possibility of Ich. Another advantage

of this was to maintain the fish in a livelier condition. Can you help me in any respect regarding this matter?

ANSWER:

Copper compounds in sufficient quantities in an aquarium are deadly. Pennies are sometimes placed in aquariums to clear green water. It does the trick, but it is very difficult to determine just when enough copper has dissolved to kill the algae without killing the fishes. We do not recommend it.

\* \* \*

From: Mrs. J. C. Todd, Jr., Burlington, Kans.

We are troubled with a pest introduced with new plants. It is less than 1/4" in diameter when grown, flat and round. The underside seems to have no covering, but the top has a thin shell. What are these and how can we rid our aquarium of them?

ANSWER:

These flat round animals are harmless little fresh water limpets, a type of snail. There is no reason for wanting to be rid of them, as they do the same work as ordinary snails, but on a smaller scale.

\* \* \*

From: George P. Woodward, Jr., Roslyn, Pa.

Next year I plan to sink a bath tub in my back yard. (1) I plan to breed White Clouds in it. How many fish should I place in it? What ratio of males and females? (2) How much infusoria should be fed? (3) In the tub I plan to set 4 or 5 large flower pots filled with sand in which I will place a good deal of Cabomba, Hair Grass and Myriophyllum. O.K.? (4) If the Cloud idea does not work, how would it be if I purchased a whole spawn of

baby Angel Fish and placed them in the tub? Would the great area force grow them to a saleable size in the 2-3 months they would be out there?

ANSWER:

(1) Up to about 25 mature breeding White Clouds should be enough for your bath tub. This will allow room for the young. 50-50 of both sexes will be satisfactory. (2) Outdoors and in partial sun, you should not have to grow infusoria for White Clouds. They will get enough from the plants and water. (3) Cabomba and Myriophyllum should be good. Also Bladderwort and Riccia. You do not need flower pots for any of these plants. (4) Angel Fish will live in an outdoor tank or pool if the conditions are right, but they are far from the ideal outdoor fish for your area.

\* \* \*

From: David H. Souter, East Weare, N. Y.

I have recently been given a piece of petrified redwood. Would this be safe to use in my 15-gallon community tank?

ANSWER:

Petrified wood usually makes a satisfactory harmless aquarium decoration.

\* \* \*

From: Jack L. Collins, Carbondale 4, Ill.

I have a customer who is having trouble with his plants dying. He is burning a 15-watt white fluorescent light 24 hours a day on a 15-gallon tank that sets in a west window, but gets no direct sun because of the shade from trees. As the reservoir at the city where he lives is low and has quite a few plants in it, the water department has been spraying the lake to cut down their taste in the water. His water has been properly aged, but he has planted his

tank for the third time and has had it for less than a month. Would there be any connection between the spraying of the reservoir and the dying of the plants? I do not know the chemical used. He also lost quite a few fish.

ANSWER:

It certainly sounds as though your friend would have to get his aquarium water from some other source. It is highly probable that they have put copper or some other poison into the water to kill the algae. Seasoning the water does not necessarily take this out. Seasoning is only effective against chlorine, but not against copper or alum.

\* \* \*

From: Michael Weigand, Boston, Mass.

I have a female Gold Guppy which has a permanent gravid spot. This condition has prevailed longer than the required time. What should I do? Once about 5 months ago she had 5 babies.

ANSWER:

The so-called "gravid spot" is not an indication of pregnancy, contrary to popular opinion. Since Gold Guppies are not prolific breeders, it is likely that she has dropped a few young occasionally, and that she was able to eat them all before you could notice them.

\* \* \*

From: John Brown, Roanoke, Virginia

I have the problem of keeping my aquarium from getting cloudy. Could you give me some advice on what causes it and what to do about it? I clean it one day and it is cloudy the next.

ANSWER:

Gray cloudy water is caused by one or more of the following: (1) Too many



*fishes in the tank. (2) Too much uneaten food left to decompose. (3) Insufficient light. We suggest you change your aquarium water completely, siphoning it from the bottom. Then do not feed for several days. After this feed very sparingly. Fishes should be able to clean up every speck of food within five minutes. Green cloudy water is caused by too much light. If this is the type you have, cut down on the light.*

\* \* \*

*From: Sol Rosen, Brooklyn, N. Y.*

I have four tanks in my bedroom. In about three weeks our entire apartment will be painted. What should I do about my fish? Should I leave them in another room, or will they be safe in the room as it is painted?

ANSWER:

*Your tanks need not be removed from the room being painted, if they are thoroughly covered with newspapers, blankets or other material, and so long as the room is thoroughly ventilated until the paint is dry. In two days the fumes are usually weak enough to remove the covering.*

\* \* \*

*From: Franklin D. Mesa, New York, N. Y.*

I would like some information on the Cryptocorynes. I plan to array my tanks with some of the well known ones. How much light should they receive daily? By light I mean artificial. I would appreciate any suggestions, ideas or advice you might give me on the Cryptocorynes.

ANSWER:

*Cryptocorynes do best in subdued light. It is impossible to say just how much artificial light is necessary. You*

*will have to experiment with it for the best results under your own conditions. If your lighting is fluorescent, use "warm white" tubes. Most varieties do well in pots containing soil. They will also grow in aquarium sand with plenty of fish droppings present, but not so well as in the pots. *C. willisii*; and *C. cordata* would probably make the best groupings, as the others require more space.*

\* \* \*

*From: William Cohen, Floral Park, N. H.*

(1) Can a tank be over-planted if all the plants are growing? (2) Is it all right to freeze live *Daphnia* for winter feeding? How would you go about feeding it to the fish? (3) Are there any garden plants that would thrive in an aquarium?

ANSWER:

*(1) Any tank can be over planted. Plants need growing space, as do fishes. (2) Frozen *Daphnia* makes an excellent winter food. Pour them into a fine cloth to permit most of the water to run off. Then freeze the *Daphnia* in blocks or in little paper cups. They are easily fed by simply dropping chunks in the aquarium. As they thaw, the fishes eat them. (3) No garden plants will long grow under water.*

\* \* \*

*From: Jan E. Tavares, North Hollywood, Calif.*

I have a pair of Pearl Gouramis 3 inches long. Are they large enough to breed?

ANSWER:

*Your Pearl Gouramis should be old enough to breed—if you have a pair. It is not size that makes a fish capable of spawning. Age is the governing factor. A pair of Gouramis would have to*

be nearly a year old to spawn. Feed them well on live foods for about two weeks and see if they will spawn. Use mosquito larvae, *Daphnia*, white worms, *Tubifex*, or garden worms.

\* \* \*

From: M. M. Sikora, Toronto, Ontario

I have several problems concerning the raising of Angel Fish: (1) What disinfectant would you recommend to be used on the eggs to prevent fungus? (2) How many drops at what strength to say a quart of this disinfectant? (3) Will too much disinfectant kill the eggs? (4) Is a temperature between 85 and 90 degrees too high for hatching Angel Fish? (5) When eggs are raised separately, what average percentage should hatch? (6) Can too much air circulation be used around the eggs? (7) A friend of mine said a young pair of Angels will have poor spawnings until the 3rd or 4th spawning. Is this correct? (8) Is it advisable to keep more than one pair of Angels in the same aquarium? (9) How many good spawn-

ings per year or season can you expect from Angels that are well fed on live food and housed in large aquariums?

ANSWER:

(1) Methylene blue is the most satisfactory fungicide for eggs. (2) Use in the strength of 3 to 5 drops of a 5% solution to each gallon of water (American standard gallon.) (3) Yes. (4) Yes. 80 is about right. (5) It is not possible to give definite percentages that should hatch, but with a good pair, a majority of the eggs should. (6) Yes. Air circulation should be steady but very gentle. (7) Young fish will have small spawnings, but there should be as large a percentage of hatch as with average mature pairs. (8) Some breeders use several pairs in very large (50-100-gal.) tanks, but most use one pair to a tank. (9) Once a really robust pair has started, they should spawn every five to seven weeks the year around, providing they are given ideal conditions—room, live food and no disturbances. Individual females vary considerably in productivity.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946  
(Title 39, United States Code, Section 233)

of THE AQUARIUM, published Monthly at Philadelphia, Penna., for October 1, 1953.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Innes Publishing Co.  
129 N. 12th St., Phila. 7, Penna.  
Editor, Wm. T. Innes  
129 N. 12th St., Phila. 7, Penna.  
Managing editor, Alan M. Fletcher  
129 N. 12th St., Phila. 7, Penna.  
Business manager, John W. Anderson  
129 N. 12th St., Phila. 7, Penna.

2. The owner is: Innes Publishing Company, a partnership consisting of:  
William T. Innes, 1824 N. Park Ave., Phila. 22, Pa.  
and  
Edward K. Innes, Aldan, Pa.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (None.)

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INNES PUBLISHING CO.  
Wm. T. Innes, Editor  
129 N. 12th St., Phila. 7, Penna.

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[Seal] JAY V. REES, NOTARY PUBLIC  
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OCTOBER, 1953

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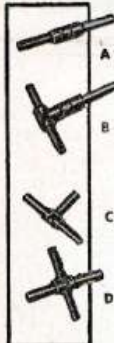
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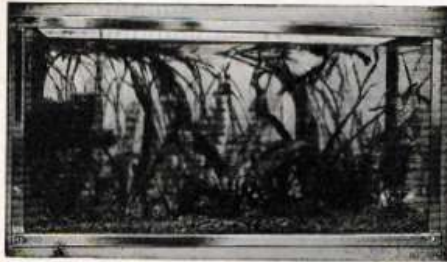
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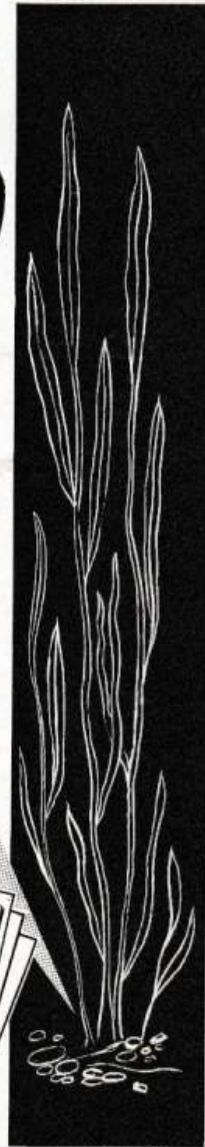
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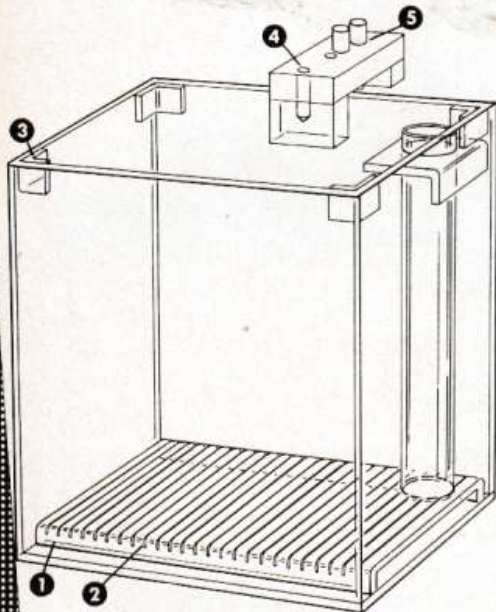
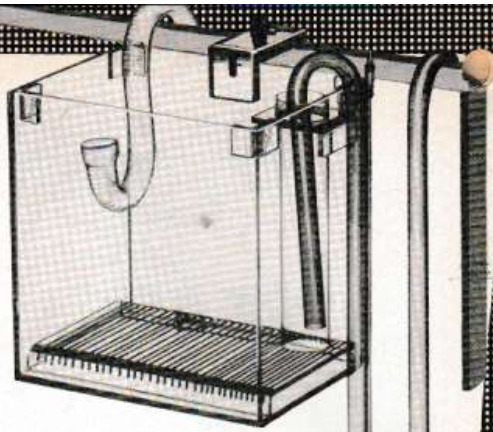
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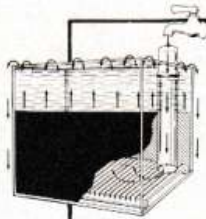
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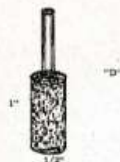
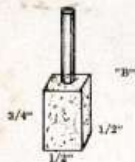
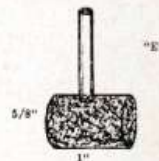
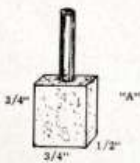
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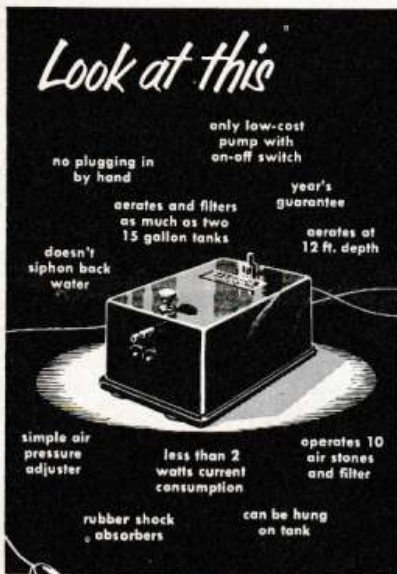
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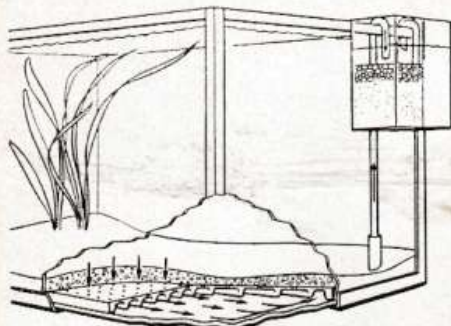
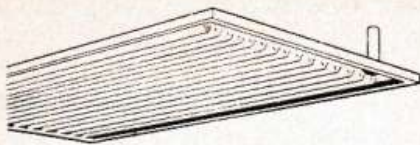
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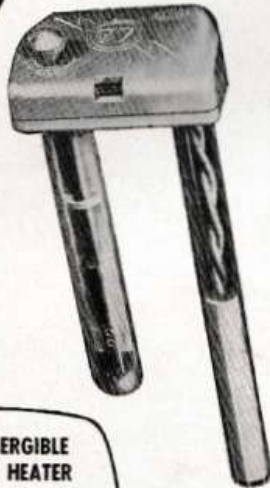
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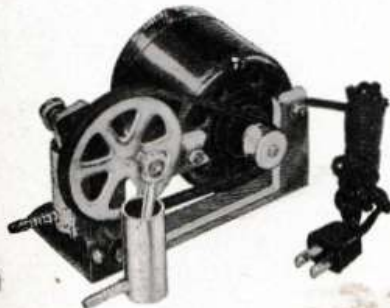


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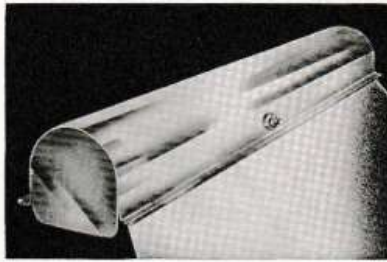
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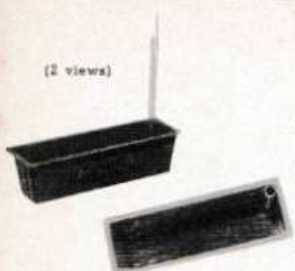
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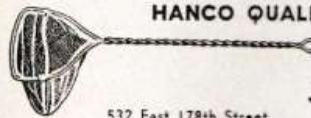
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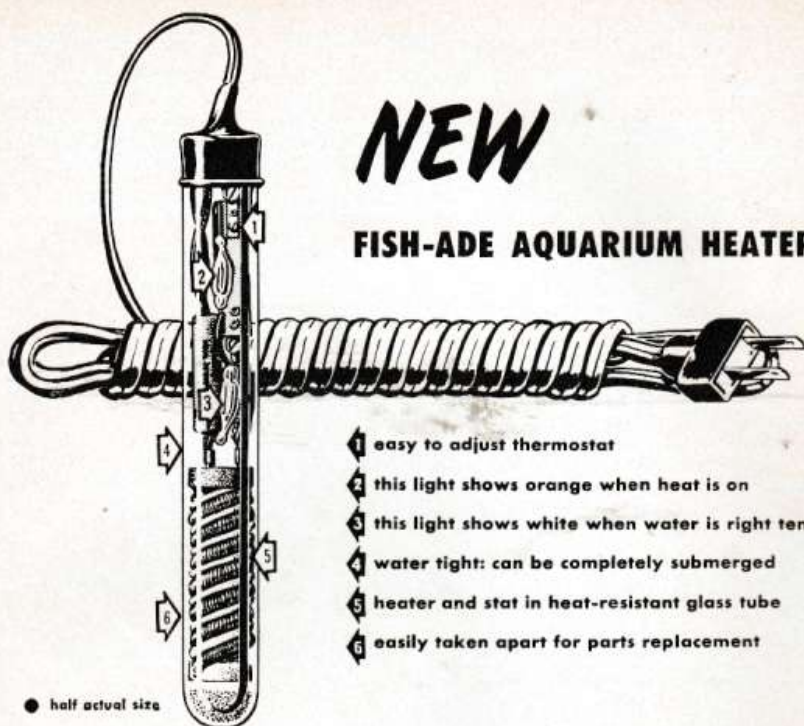
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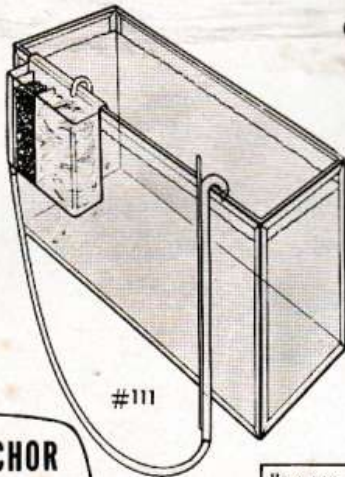
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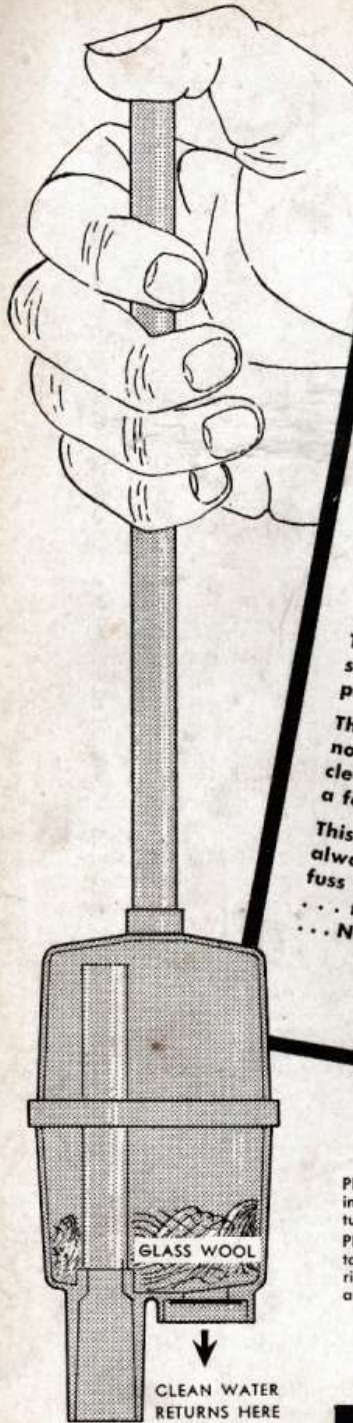
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