

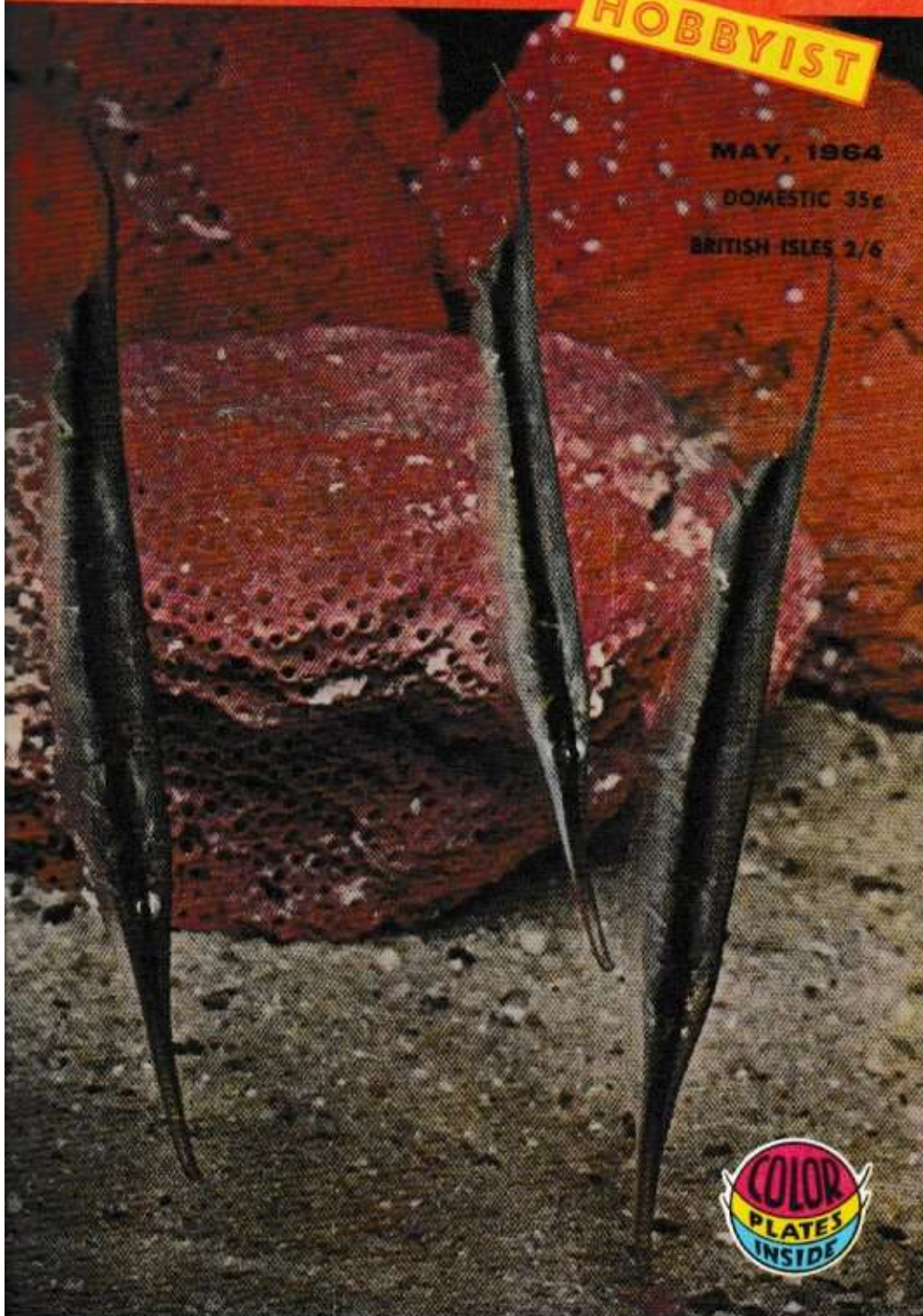
TROPICAL FISH

HOBBYIST

MAY, 1964

DOMESTIC 35¢

BRITISH ISLES 2/6





GOLDFISH FOR THE NOVICE, by Joseph B. Roberts, Jr. 75c from your dealer or direct from TFH.

It is impossible to put down all there is to know about Goldfish in a 32-page booklet, but Joseph B. Roberts, Jr. has done remarkably well in telling us what the beginner should know. Most of the pictures illustrating this work are by one of England's most eminent fish photographers, Mr. Laurence E. Perkins. Chapters include the choice of equipment, the Goldfish varieties and how to choose them, Goldfish care and feeding, methods of breeding, development of fry, and the various Goldfish diseases and methods of treatment.

There are many beginners who "get off on the wrong foot" with Goldfish, and much trouble can be avoided by getting this book first and the fish afterwards, rather than relying on guesswork and reading the book only after trouble develops. There would be many more fish hobbyists if they first armed themselves with a working knowledge of the subject before making a lot of useless purchases and winding up discouraged with the mistaken idea that fish-keeping is only for the expert. Mr. Roberts' language is simple, and he not only knows his subject but also is able to convey his knowledge to the reader.

TROPICAL FISH HOBBYIST

Dr. Herbert R. Axelrod, President
William Vanderwilt, Publisher
Neil French, Editor
Dr. Leonard F. Schultz, Advisory Editor
Hans Peter, Overseas Editor
Len Fiddle, Advertising Manager
Dr. Aaron Axelrod, Business Manager
Harold Schultz, Expedition Chief
Fred Buesi, Art Director
Helge Moos, Art Assistant

Contents

Vol. XII, May, 1964 (#99) No. 9

A review of the Chilodinae, with a key to the species 3

How Does the Shimofish Swim? 11

Meet the Hobbyist — W. G. Phillips 22

Hypoclinemus bellotti 33

Hypoclinemus agulhae 35

The Electric Carib 39

FEATURES

Mail Call, p. 41, Guppy Corner, p. 32, Bits from the Seven Seas, p. 15.

COVER

The cover this month is devoted to a bit of ichthyology known as Shimofish, *Ancistrus stragulus*, as photographed by Klaus Poyser. On page 11 legend Dr. Wolfgang Koenig's detailed article about the peculiar swimming mechanism of this fish, based on observations made in the marine aquatic of the Exeterium of Frankfurt Zoo.

EXOTIC TROPICAL FISHES SUPPLEMENTS

Pages 33 and 34, 39 and 40. These pages are provided for easy removal and punched to fit into the looseleaf Edition of EXOTIC TROPICAL FISHES.

RATES: 35¢ per copy in the U.S. 35¢ per copy in Canada or foreign. \$2.00 for 12 issue subscription. All back issues available at 35¢ per copy. Issues available in every 12th issue.

In Canada Tropical Fish Hobbyist magazine and books are sold exclusively through Canadian Aquarium Supply Co., 1125 Talbot Street, St. Thomas, Ontario. All subscriptions and inquiries from Canadians should be directed to them.

In England and the western Sealing area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 29 Station Road, Keston, Surrey, England. All subscriptions and inquiries should be sent directly to them.

© 1964 T.F.H. Publications, Inc.
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc., at 245 Constitution Avenue, Jersey City 2, N.J. Printed in U.S.A.

EDITORIALY . . .

The International Federation of Aquarium Societies announces the big yearly event for fish hobbyists - the annual Convention. This year's convention will be held on July 10, 11, and 12, which will make it easier for many to attend, because it comes during the vacation season. Chicago is the chosen site, at the Chicago Midway House Motel, 5400 S. Cicero Avenue, Chicago 38, Illinois. Those who attended the 1960 convention will surely remember the grand time we had in Chicago and need no urging.

Friday, July 10th will be devoted to board meetings and setting up the International Guppy Show. Saturday afternoon there will be tours to the points of interest, no doubt including the Shedd Aquarium. Saturday evening will be the big one: a cocktail hour, a good meal, an outstanding speaker and the Honors Awards for the year's most eminent Hobbyist, Author, Scientist, and Region. A new award will be given to the best society publication of the year. There will also be an award to the winner of "Guppy Man of the Year." On Sunday the T.I.F.A.S. members will meet and make plans for the future. In the afternoon there will be a Guppy auction.

Having attended the 1960 convention in Chicago I can say that the city has much to offer, that its hobbyists are a very friendly group, and that a visit to the T.I.F.A.S. Convention will be one to be long remembered!

William Vanderwilt

Tropical Fish Hobbyist

THREE NEW STAR SALES MAKERS

HEATER: These heating lamps convert the aquarium into an underwater playground as they heat, aerate, and clean the water.

FILTERS: The filterlets playfully cling freely in the water, pump or no pump, or if no pump for pre-filtration, as though attached to the bottom of the aquarium.

AIR PUMP: New, improved model of the most powerful, vibration-free pump on the market. This low-priced quality pump now comes with a registered four-year guarantee.

AQUA AIR PRODUCTS • 4725 EAST 10th AVE. HIALEAH, FLORIDA

May, 1964



Fig. 5. *Coenotropus maculosus* (Photo by Dr. Herbert R. Axelrod, of specimens collected by himself in the Rio Rupununi).

A review of the Chilodinae, with a key to the species

by Dr. J. Géry¹

The Chilodinae are an interesting little group, in some ways unique among the characoid Fishes. Some of their characteristics urgently need biological study, for they are only known anatomically: i.e., a very striking dilatation of the fourth branchial arch (adaptation to poorly oxygenated waters? or filtration apparatus?) and pharyngeal teeth, besides other differentiations like minute teeth attached only to the lips, scales sometimes crenulate, oblique swimming habit, and so on.

As they are also not well known systematically, and even less nomenclatorily, the following short review may be of some use to ichthyologists as well as to all serious aquarists. It is recommended that you study first the interesting paper by Harald Schultz (1961).

I. NOMENCLATURE

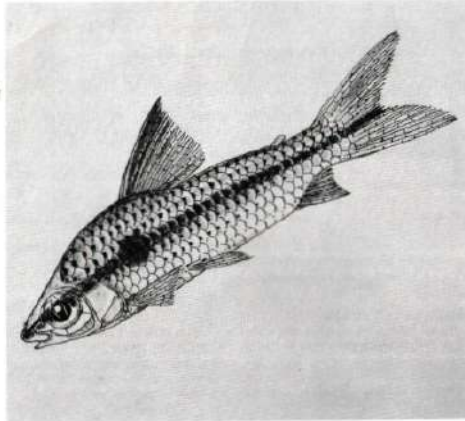
(1) *Chilodus punctatus* was described by Müller & Troschel as early as 1844. This is the species referred to by Geisler (1959), which was "spawned" for the first time by Foigs (1955). The typical form comes from the Guianas. As pointed out by Harald Schultz (1961), other populations do exist, particularly in the lower Amazon, in the Upper Amazon and in the Guaporé.

¹ Contribution Nr. 36 to the study of characoid Fishes.

(2) *Caenotropus labyrinthicus* was described by Kner some years later (1859). The generic name *Chilodus* is being used often instead of *Caenotropus*, for the species *labyrinthicus*; this is a matter of nomenclature which is still being discussed, and whose story is something like a Chinese puzzle:

- (a) The species *labyrinthicus* was the type-species of a new genus: *Microdus*. Later on, the name *Microdus* was shown to have been used two years earlier (1857) by Emmons for a fossil tooth (probably of a shark). One of the most important "Rules of Zoological Nomenclature" states that two names with the same spelling (homonyms) can not be used for two genera in the whole animal kingdom: if two homonyms exist, the former one has priority over the second one, which is said to be "pre-occupied" and which has to be replaced. Thus Günther (1864) proposed *Caenotropus* instead of *Microdus* in his *Catalogue of the Fishes in the British Museum* (part V, p. 297).
- (b) Had Günther only made this change, everything would have been set, and *Caenotropus* would have been valid with a definite type-species (*labyrinthicus*). It would have been of the same level as *Chilodus*, with its correct type-species *punctatus*. But here began the difficulties. Günther

Fig. 3. *Caenotropus labyrinthicus labyrinthicus* (specimen from the Upper Rio Meta in Colombia, leg. Mr. Ross Socolof).

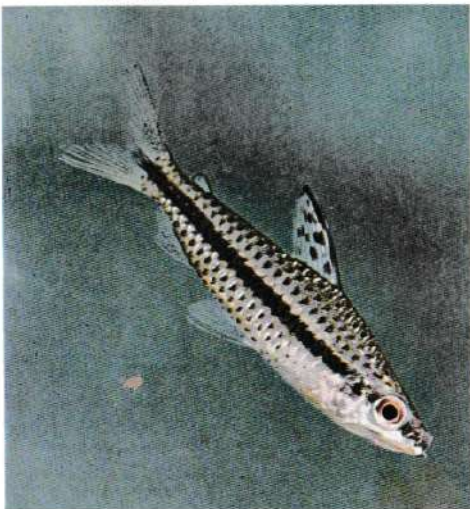


6

The proper status of *Caenotropus* is actually being submitted to the opinion of the International Commission of the Zoological Nomenclature (Géry & Hoedeman, 1962). We proposed to retain *Caenotropus*, whose type-species was already correctly designated in 1910. This designation invalidates all subsequent designations, as stated in the rule of the "first revisor." *Caenotropus* will be used in the following systematic comments.

(3) A third genus, *Tylobronchus*, together with its type-species *maculatus*, has been described by Eigenmann in 1912, from British Guiana. It is nominally valid but, as it will be pointed out, it is scarcely separable from *Caenotropus*. Its only generic character is that it has "teeth in the lower as well as in the upper jaw," whereas *Caenotropus* is said to have teeth on the upper jaw only. Anyhow, if this genus *Caenotropus* is to be invalidated, *Tylobronchus* is a perfectly available substitute.

Fig. 8. *Chilodus* ? species (Photo by Harald Schultz).



8

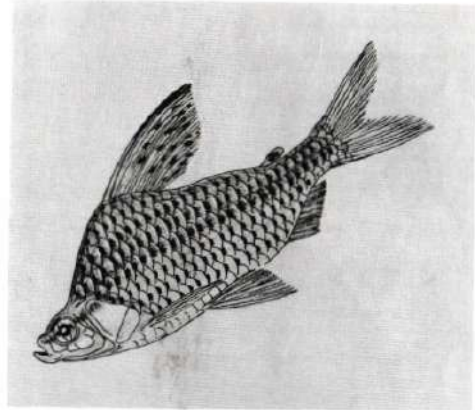


Fig. 7. *Chilodus punctatus zunevei* (after J. Puyo).

believed, erroneously, that *Chilodus* also was a homonym of an earlier generic name (in fact the name in case, the Protozoan *Chilodon*, has a different ending, which is nowadays considered sufficiently contrasting). He also believed that *Chilodus* and *Microdus* were scarcely separable and he merely put them together in his new genus *Caenotropus*, without saying which species, *punctatus* or *labyrinthicus*, he believed to be typical of the genus (the procedure of designating a type-species was not as drastic as it is now).

- (c) Then came Eigenmann, whose monographs on Characids are still the standard works of reference. Eigenmann designated, in 1910, the species *labyrinthicus* of Kner as the type of *Caenotropus*, retaining *Chilodus* with *punctatus* as type-species. He was acting then as "first revisor" and he had all rights to do so.

Nevertheless there are some specialists like Fowler (1914 et seq.), L. P. Schultz (1944) and chiefly H. Travassos (1951), who believe that *Caenotropus* is invalid. Travassos says that if Günther considered *Chilodus* and *Microdus* as a single genus, then the type of such a genus would be the older species, in this case *punctatus*. As *punctatus* is altogether the type of the "good" and older genus *Chilodus*, *Caenotropus* would be automatically a synonym of *Chilodus*, hence invalidated.

7



Fig. 3 bis. *Caenotropus labyrinthicus labyrinthicus* (?) (specimen of unknown origin, not examined; Photo by Dr. Herbert R. Axelrod).

II. SYSTEMATICS.

The *Chilodinae* may be tentatively defined as follows:

Lateral line complete; scales cycloid (*Chilodus*) or cyclo-ctenoid (*Caenotropus*); preventral flat; anal short; adipose fin present; skull (fig. 1) rather strongly reminding that of *Hemiodus*; circumorbital bones chain entire, the antorbital (also called jugal or SO.) very developed; dermethmoid pointing forward, the premaxillary, under it, reduced; a supra-preopercular canal still visible; fontanels present. Mouth almost superior (*Chilodus*) or almost inferior (*Caenotropus*); lips rather thick (except the inferior one in *Caenotropus*), with very tiny weak teeth, only visible under the binocular magnification, inserted into the lips, hence movable and easily lost; those of the juvenile *Chilodinae* rather long, numerous and translucent; those of the adult ones short, deep in the lips, reduced in number (chiefly on the lower lip where—as in *Caenotropus labyrinthicus* for example—there may be no teeth at all) and brown tipped, frequently truncate or slightly bifid. Inner part of the fourth gill arch cartilaginous, very thickened; pharyngeal teeth numerous, hooked (fig. 2). A more or less dark, longitudinal band; base of each scale with a dark spot, giving a "speckled" aspect to the species.

This small, highly specialized group, whose members swim tilted down at about 45° or more, seems to be intermediate between the *Hemiodinae*, on one hand, and the *Curimatinae* s. lat., including *Prochilodus*, on the other. They

9

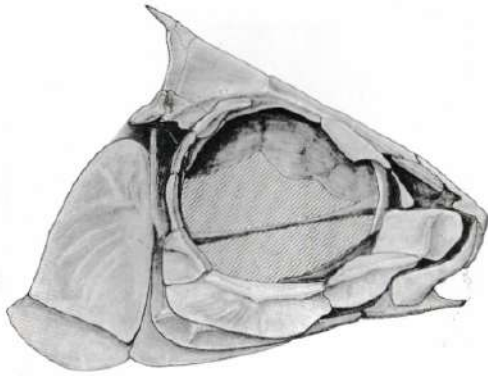


Fig. 1. Lateral view of the skull of *Caenotropus labyrinthicus* (specimen from Obidos).

seem to be slightly more remote from the Anostominae³ which, together with the Erythrinae (including Lebiasinidi, Pyrrhulini and Nannostomidi) and the last named groups, are well apart from the Characidae and can no more be classified with them, as is still sometimes done.

The examination of many specimens from different localities⁴ leads me to recognize only two genera: *Chilodus* and *Caenotropus* (the reasons for admitting this last genus were given above). *Tylobronchus* Eigenmann is too near *Caenotropus* to be accepted, at least provisionally, for the presence or absence of teeth on the lower lip is not a reliable character. *C. labyrinthicus* may have one (or perhaps more) tooth on the lower lip, whereas *C. maculatus* has often not more than 2 or 3 teeth on the same lip.

³ Despite the common oblique swimming.
⁴ *Chilodus punctatus* Müller & Troschel: 97 ex. from British Guiana, Surinam, Loreto District in Peru and Upper Rio Meta, including a specimen determined by Eigenmann.
Caenotropus labyrinthicus Knorr: 5 ex. from Obidos, Rio Puty and Upper Rio Meta, including a specimen determined by Steindachner.
 The type of *C. labyrinthicus rapumtani* (Fowler) was kindly examined for me by Dr. James Böhlke.
Caenotropus maculatus (Eigenmann): 30 ex. from British Guiana and French Guiana, including a paratype of Eigenmann.
 I was unable to recover *Chilodus nanosus* (which was described without type designation) in its typical locality, the Litani River.

Continued on Page 68

About an unusual fish.

How Does the Shrimpfish Swim?

BY DR. WOLFGANG KLAUSEWITZ,
Senckenberg Museum, Frankfurt

For some time the Exotarium of the Frankfurt Zoo has kept some Shrimpfish (*Aeoliscus strigatus*, in the family Centriscidae). These varied entirely in form from normal and for this reason have stirred up some excitement. In form these fish resemble a knife blade. The body is 4 to 4½ inches long and covered with bony plates, the dorsal edge slightly rounded and the ventral edge almost knife-sharp. While the snout is elongated with a long tube, the "tip of the tail" is formed by the first dorsal ray, which in the process of evolution has moved so far back that it now forms the hind end of the body. The remaining dorsal rays have moved still farther back and are to be found on the ventral side. They form a near union with the caudal and anal fins, which lie together on the underside of the after end of the body.

Such aberrations in form lead the morphologists to question the function and utility of the body, especially the fins. How can such a fish swim? For a

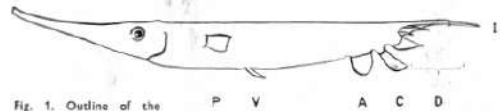


Fig. 1. Outline of the Shrimpfish, *Aeoliscus strigatus*. I: first hard ray of the dorsal fin; A: anal fin; C: caudal fin; D: dorsal fin; P: pectoral fin; V: ventral fin.

long time we have known that the body is held at a vertical position, but for a long time it was not agreed whether the head was pointed up or down. Now, the latest publications with photographs of living specimens by Herald (1961) and Hass (1961) should give a final answer to this question: they swim with their snouts down. This position is made necessary by the position of the swim-bladder and the resulting distribution of weight. The ones we observed in the Exotarium always held the same pose.

But how can they propel themselves? How can they swim even in such a position? By much thorough observation over a length of time we think that we have analyzed the function of the tiny vibrating fins to a great enough extent to present them here.



When you're looking at aquariums

Take a Second Look

ALL AQUARIUMS ARE NOT THE SAME

One is so different from the rest that the manufacturer stamps his name indelibly into the stainless steel base. He is so proud of his product he doesn't want you to confuse it with others.

LOOK FOR THE  STAMP AND SEE WHY

Available Through Better Petshops and Jobbers
Throughout the 50 States

PATT ENGINEERING & MANUFACTURING CO.

16539 So. Main St., P.O. Box 110, Gardena, Calif. - FA 1-5851

Penco Manufactures a Complete Line of Aquarium Accessories



Above: *Aeoliscus strigatus*, represented horizontally for better appreciation of the odd finnage and body configuration. Below: *Aeoliscus strigatus*, represented in the head-down swimming position of the species. The three Shrimpfish illustrated are stylized in that the species' usual swimming position is less perfectly perpendicular than illustrated here.



Illustration by Lee Chin Eng

BRAND NEW

The Most Sensational Fish Food You Can Buy . . . Guarantees Your Fish Better Growth, Vigor, and Coloration or Your Money Back!

Now you can be sure your fishes and turtles get all the vitamins, minerals, protein, and bulk they need. No more spitting out essential foods they don't like—foods that collect on the bottom to cloud and contaminate your aquarium.

New Oscar foods are in pellet form, and each formula is blended with natural foods your fishes and turtles can't resist—shrimp, tuna, crab, liver, and high-protein whale meat. Either this revolutionary food gives them better growth, vigor, and coloration in 30 days, or you get your money back . . . no questions asked (see below).



HERE'S HOW IT'S DONE: Shown are some Tropical Fish Food pellets, in "coarse" grade. Each of these tiny pellets contains a balanced diet. Each contains an exacting blend of the nutrients your fishes must have for healthy growth, vigor, and coloration. Note the absence of powdery waste, the uniform size. Only the finest materials were used, and only Oscar's unique triple-grind, mix, press, and grading process makes this possible . . . guarantees you the finest fish food your money can buy.

5 SPECIAL FORMULAS

Each of five special formulas contains its own concentration of those nutrients ichthyologists state are the most beneficial to each variety of fish: a 64% protein formula for the tropical fish and guppy foods; a concentrated carbohydrate formula for goldfish; a concentrated vegetable base formula for mollies. The turtle formula is fortified with vitamins A and D to help prevent soft shell.

TRY THIS FREE OFFER. Ask your dealer for your free sample of Oscar Tropical Fish Food. If he has yet to stock Oscar foods, let us know. We'll see that free samples are sent to him immediately.

GUARANTEED: If your fishes or turtles don't actually look better and more vigorous in just 30 days of feeding with the specified formula, return the unused portion to your dealer and your money will be refunded. Buy a can of Oscar Fish or Turtle food today!

OSCAR ENTERPRISES, INC. / 1216 FIFTH ST. DEPT. C BERKELEY, CALIFORNIA

We have always seen them swim head-down in a vertical position. They only permitted themselves to vary as much as 20°. They do not seem to be able to assume a horizontal position, even when impelled to quick flight.

The fins are used as swimming organs in the following manner: the real propelling organs are both pectoral fins in the front of the body and the downwardly directed dorsal fin at the rear of the body (with the exception of the first ray). The pectoral fins beat as they are needed, together or singly. The dorsal fin, which lies toward the ventral region, beats back and forth.

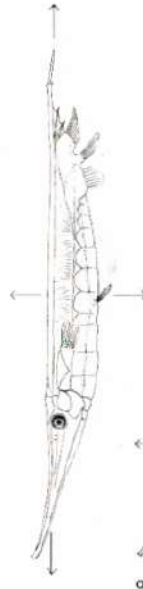
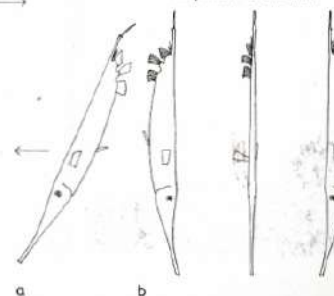


Fig. 2. Arrows show the four directions of motion of which *Amblystoma tigrinum* is capable. Drawing shows the normal body pose.

Fig. 3. The body position at different methods of propulsion of *Amblystoma tigrinum*. a. The slight tilt when moving forward (arrow shows direction). b. Turning maneuver when changing direction by 180°. Note the position of the fins.



The suppositions of Böker (1935), that the three unpaired fins acted together for propulsion, do not agree with our findings.

In spite of the small size of its fins, this knife-like fish can move with considerable speed, like an arrow, and is able to make swift and abrupt maneuvers. Four directions of motion can be listed and are constantly displayed when swimming about:

- Forward (rostrate), vertical with the head forward.
- Backward (caudate) vertical with the end of the body in front.
- Toward the belly (ventrate), with the sharp belly edge in front.
- Toward the back (dorsate), with the back edge in front.

The dorsate manner of swimming, where the body is tilted about 20°, is the most common method of locomotion and represents the real manner of swimming forward. The fish cannot swim in any other than the four directions named. Therefore the turning possibility around its axis may be considered as a very important method of moving. The following fins serve as steering mechanisms for these turns: the caudal fin, by turning left or right, as well as the similarly shaped, underlying anal fin, which performs the steering motion.

The actual turning procedure is performed by unharmonious beats of the pectoral fins: the one on the outside beats vigorously while the one on the inside remains motionless. The ventral fins are seldom used, and only in the turning are they put into motion by folding over and beating sporadically. The combined result is so great that the fish is able to make sudden directional changes up to 180°.

The first hard ray of the dorsal fin plays a remarkable part as a tail spike. In the normal swimming position it is an extension of the body axis and pointed straight back. This position is taken by the spike during the vertical forward and backward swimming. At the least tilting of the body, especially when swimming forward with its back turned toward the swimming direction, it is turned parallel to the direction in which it is swimming. This is also true when it changes direction and swims with its belly first. When resting, there is a slight tilt to the body and the fin ray. This ray can be turned only toward the belly side, and not toward the back. It seems to affect the body position and may have a certain function as a steering and balance organ.

After this manuscript was finished, there was an article by Atz (1962) about some questions concerning its swimming. The author offers an additional meaning to the function of the dorsal ray of the Shrimpfish. He mentions that these fishes usually swim close under the water's surface. When a Shrimpfish swims straight upward, the ray is turned the same way. As soon as the water's surface is reached, it is laid over and the fish stops ascending at once. As this ray is provided with muscles, ligaments and nerves, it could serve as a dorsal "organ of touch." In this way there is afforded a certain amount of safety

Quality-Built for Superior Performance!

Supreme AIR PUMPS



SUPREME DYNAMASTER
—Available in one and two cylinder models. Each cylinder delivers 200 cu. in. air/minute. Oil reservoir built in gear-type teeth to prevent slippage. Quiet, smooth operation. 1/10 H.P. maintenance-free motor. Hand-somely finished.

SUPREME AIRMASTER MODEL 100—1" cylinder delivers 400 cu. in. air/minute. 1/10 H.P. continuous-duty motor. Operates from 5 to 15 aquariums. No spin, oil resistant Nipponese belt.



SUPREME AIRMASTER MODEL 100



SUPREME CHALLENGER

SUPREME CHALLENGER—Economical, compact pump requiring a minimum of service or attention. Delivers approx. 150 cu. in. air/minute. No belt to replace or adjust.



SUPREME SPECIAL

SUPREME SPECIAL—Low cost unit for the beginner who wants trouble-free service at the lowest possible cost. Delivers approx. 50 cu. in. air/minute. Operates up to 4 tanks.

From Beginner to Hobbyist, there's a Supreme Pump for Every Need!

Quality-built by the foremost manufacturer of aquarium products, this is the **one** line of air pumps that will give superior performance year after year! Supreme materials and workmanship are guaranteed against defects for one year from date of purchase! All cylinders are permanently aligned . . . never need adjustment!

NEW!

Supreme Oil specifically made for all Supreme pumps and small motors!
(NOT SHOWN) SUPREME AIRMASTER MODEL 75—Quiet trouble-free, 3/4" cylinder. Delivers 120 cu. in. air/minute. Operates up to 5 tanks.

EUGENE G. DANNER MFG. INC.
1660 Summerfield Street
Brooklyn 27, New York

SERVICE AND REPLACEMENT PARTS ON ALL SUPREME PUMPS ALWAYS AVAILABLE!

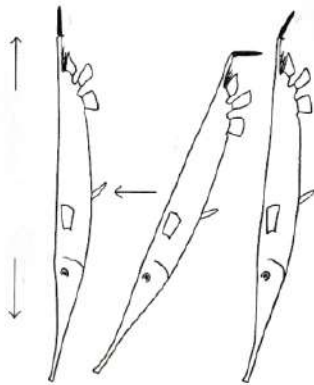


Fig. 4. Position of the first hard ray in the dorsal fin of *Aequipecten irradians* at the different swimming directions. Left: The fish swims vertically, up or down. Center: Caudate motion, forward with the back turned the same way. Right: Normal ray position when resting. The arrows show which way the fish could be moving. All drawings by Ingeborg Weirich.

from surface feeders such as birds. We do not believe, however, that this is a function of the caudal ray.

The ecological reason for the body form of *Aequipecten irradians* still offers considerable difficulty. However, Böker gave the armored body and the construction of the fins as an example for a reconstruction to a reaction of the organism. A real explanation for this unusual change in shape is, however, not to be found by the author. Certainly it can be said that the Shrimplish with their characteristic up-and-down positions cannot be inhabitants of the open waters. For this reason they should be given a living space which is not too bare. Coral branches and split rocks are what come to mind. In this direction we are brought to a photo by Hass (1961) which shows a school of *Aequipecten irradians* seeking shelter between the hands of a diver who holds them to resemble a pair of clamshells. A very convincing nature document is given by a photo by Herald (1961), which shows a school of these fishes resting among the spines of a sea-urchin. If one compares the *Cheilodipterus neocentriatus*, which usually has a close co-existence with the long-spined sea-urchins, with *Aequipecten irradians*, one gets the impression that the shape of the Shrimplishes offers an extraordinarily good opportunity for such a co-existence. Even if they find it necessary to move in order to feed on the tiny plankton which swim around the sea-urchin, when there is danger and when darkness begins they seek the constricted but well-protected space between the long needles of these echinoderms. Up until now, this is strictly theory; we hope that underwater observations in their native haunts will cast more light on the living habits of this unusual fish.

ACCENT Your Garden With The NEW "Aqualite" GARDEN POOL

A new adventure in horticulture. A summer home for tropical fish. Used in multiple for cascades and waterfalls.

YOU CAN NOW HAVE A GARDEN POOL FOR ONLY

\$13.95

OR THIS DUET FOR ONLY

\$26.00

F.O.B. Whitman Shipped S.E.A.



WATERFALL KIT, PLANT COLLECTION, AQUALITE POOL ALL FOR ONLY **\$42.50** (Save \$5.95)

Actual photo of Aqualite pool showing pool resting for standing and shading economy. Dimensions: 48" x 40" x 12" Deep.

Prices higher in some areas due to freight.

Dealers—Distributors, write on letterheads.



(No plumbing required.)

WATERFALL KIT for this pool complete with instructions. **\$22.50** pos.

FEATURES OF AQUALITE POOL:
Safe for children. Only 12" Deep. Durable High Impact Polyethylene with special rigidity. Washable in covered tubs. Light-weight—only 8 lbs. Beautiful aqua shade that never needs painting. Economically priced for all. Easy to install by anyone in one hour. Can be fitted in multiples for spectacular effect as shown. Large enough for successful water lily culture anywhere that will receive six or more hours of direct sunlight, for breeding tropical fish and garden. (Will sustain its weight in water without strand support.)

AQUALITE POOL PLANT COLLECTION:
1 Greening Palm, 1 Water Lilies, 1 Parasol Water Lily, 1 Water Lilly, 6 Goldfish, 1 Hybrid Water Lilly, 6 Snails.
Overwatering plants and 1 Pin of goldfish food. Also water lily fertilizer. We reserve the right to substitute plants of equal or greater value.
only \$10.00 F.O.B. Whitman (\$11.95 Postpaid)

Raise Tropical Fish and Plants outdoors this Summer. Indoors this Winter

"If it grows in Water We Have It"



AQUARIST!

Try our plant specials (Greenhouse Grown) One Center Plant in Each Group.



Receive The NEW BOOK (A Complete Guide) "GARDEN POOLS" 64 pages and color plates plus our New Water Lily Catalog. Both for only **\$1.50** pos.

"Aqualite will sell all Summer long"

Dealers and Distributors inquire on Letterhead only

Paradise GARDENS

Sole Representative of Aqualite Pool Co. 14 May Street, Whitman, Mass. Gibson 7-4711

Meet the Hobbyist . . . W. G. Phillips

BY JAMES KELLY
Chairman, Fancy Guppy Association of Great Britain

Cast your mind back to the year 1899! In America, President McKinley was ensconced in the White House, while on the other side of the Atlantic, Queen Victoria in Britain was receiving the news of the outbreak of the Boer War, and was " . . . not amused."

Just a short journey from London, a 17-year-old youth, already the proud possessor of a fish tank for three years, was joining his first fish society . . . The Southsea Piscatorials.

Thus we ring up the curtain on the career of judge, author, breeder and fishkeeper extraordinary, Mr. W. G. Phillips.

Trying to cover his varied and colorful career in a few words is like trying to teach a caveman the intricacies of a modern computing machine in the space of a few hours.

At the ripe old age of 81 he is still active and must be one of the oldest, if not the oldest, Guppy breeder in the world, still President of the Fancy Guppy Association of Great Britain, and still carrying on keeping and breeding fish as if he were sixty years younger.

Though his long association with fishkeeping has embraced most types of fish both tropical and coldwater, it is with the Guppy that Mr. Phillips has achieved the most fame. On the occasion of his eightieth birthday aquarists all over the world sent him dozens of greeting cards and telegrams, and the members of his own Association sent him over 100 replica First Award Cards suitably engraved with the "points awarded" space emblazoned with the figures 80. One English monthly magazine honored him with a two-page spread and gave him the title 'George Guppy.'

His home at Regal Way, Kenton, a pleasant suburb of London, has over the years become a veritable Mecca for Guppy breeders and aquarists, and to talk to George and hear him reel off experiences with this person and that is like the unfolding of a fishkeeper's *Who's Who*.

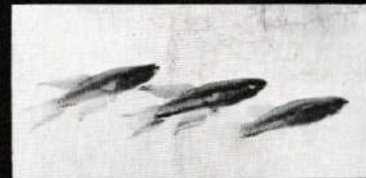
At an age when most of us would be content with slippers by the fireside, this bundle of energy still maintains over twenty tanks and over 600 fish.

Like most keen fishkeepers of my acquaintance, tanks are everywhere, overflowing happily into the house, garage, and instead of 'fairies at the bottom of his garden' he has more tanks, not forgetting the fish pools and well-stocked *Daphnia* pond.

From his agile brain and keen interest in judging practice came the original idea for the now universally used 'Five Twenties' method of pointing, and

Tropical Fish and Aquatic Plants

DEALERS AND JOBBERS ONLY



Aphyosemion bivittatum

Green Discus	<i>Aphyosemion bivittatum</i>	Blue Discus
Cardinal Tetra	Golden Lyretail Panchax	Puffers
Albino Swarfetail	<i>Aphyosemion chrysi</i>	Black Neon (azelrodi)
Albino Molly	<i>Aphyosemion spurellie</i>	Upside-down Catfish
Elephant Nose	<i>Aphyosemion nigerianum</i>	Kribensis (Africa import)
Tetra roberti	<i>Epiplatys bifasciatus</i>	<i>Neolebias ansergei</i>
Blue Gularis	<i>Alestes longipinnis</i>	Rasbora
Clown Loach	Lyretail Black Molly	<i>Nothobranchius guentheri</i>

Please use your business stationery in writing for current list.



Aquatic Fisheries, Inc.

1000 Pelham Parkway South
New York 61, New York
Cable Aquarfish

Phone: 212-892-6161

QUALITY — VARIETY — SERVICE

Q. Where Can I Learn The Secrets of COMMERCIAL BREEDING?

A. If you mean the real lowdown from the men who have made millions in this booming field, the answer is ALL-PETS, the business magazine for professional breeders. Every month, the pages of this unique magazine are chock full of money-making tips from outstanding authorities like Axelrod, Schultz, and Vorderwinkler on fish; Bates, Busenbark and Levi on birds; Whitney, Horswell and Judy on dogs; Ramsdale, Wolfgang and Bean on cats; and a host of other experts on all the other livestock you can breed for profit.

Q. How Do I Subscribe to ALL-PETS?

A. ALL-PETS is strictly business. If you have just a casual interest in breeding, it really is not for you, but if you are the kind of person who sees the real potential in this growing field, then fill out the following and mail to ALL-PETS along with your check or money order. P.S. If you are going to subscribe, you can get a copy of the 1964 All-Pets Livestock Directory, an invaluable reference, free, just by checking the appropriate box below. This directory will be published in the fall.

ALL-PETS MAGAZINE, INC.
245 Cornillon Avenue
Jersey City 2, New Jersey

One year - \$5.00
Canada & Mexico - \$6.50
Foreign - \$9.00
Sample Copy - 50 Cents

Gentlemen:

I am seriously interested in commercial breeding and would like to subscribe for one year, effective immediately. Enclosed is my check for \$..... My special field and interest is: Cats Dogs Fish Birds Other.

By all means, please send me a free copy of the 1964 All-Pets Livestock Directory.

NAME

ADDRESS

CITY STATE ZIP CODE

New York, where he went to work for a firm of cabinet makers, later moving on to work in an amusement park in Brooklyn's Coney Island, and from there to Willow Grove Park, Pennsylvania.

After saving about \$1,000, he returned to Britain, married, and bought a tavern. While he owned the tavern he was once charged with permitting gambling. Although he was completely exonerated, he sold out and returned to the amusement business he had learned in Brooklyn by accepting a position as Superintendent of White City Exhibition. During the next few years he traveled extensively and supervised amusement parks in most of the principal cities of Europe.

When World War I broke out Mr. Phillips was at work in Berlin. He was immediately interned as a civil prisoner of war, and even in this unhappy position he was able to bring his wits and skill to bear to be able to keep fish. The prison authorities had given him the job of helping to catch and kill the many rats which infested the camp, so, by telling the authorities that the rats could not be brought under control unless they were killed off at their source, a local canal, he was able to go outside the prison camp (under guard) and smuggle fishes from the canal back into the camp. He kept the fishes in tanks fashioned from discarded food containers, but they, being less able to withstand the necessarily miserable diet offered them, soon succumbed.

On his release at the end of the war, Mr. Phillips went to work as a woodcarver at the Portsmouth dockyard and was good enough at this trade to be commissioned to carve by hand the bowsprit of the Royal Yacht. Despite his natural ability in this field, however, he soon tired of woodcarving and went back to one of his first loves, the amusement park business. He worked on the design and construction of the Wembley Exhibition and Crystal Palace, and after this became Manager of the amusement pier at St. Leonards-on-sea, in which job he retired. The pier was pulled down after being severely damaged during World War II.

It is interesting to note that two of the foremost Guppy breeders in the world, Paul Hahnel in America and Mr. Phillips in Britain, have in common an outstanding woodcarving ability.

If you get on to the subject of fishkeeping (and I would be very surprised if you paid him a visit and didn't!) you will find he has some very definite views. Having tried most foods, he still insists that the genetical makeup of the parent fish is of prime importance; "all the cats in the world wouldn't turn a Shetland pony into a carthorse," is one of his stock retorts to this question of feeding and size.

If you are familiar with the usual Guppy setup you will get a few surprises here. He doesn't like Catfish as scavengers, preferring to feed his charges just enough and letting a siphon and snails clear the remainder. If you expect to see well-planted tanks, too, you are due for a surprise, because the usual must in plants for Guppy breeders, Water Sprite, is not used, because in his



Mr. Phillips with a few of his trophies, 1963.

most of the Guppy Standards produced in Britain for the past twenty years have started from his drawing board.

On the show scene his attention to detail, knowledge of aquaristics, and the patience to wait for strain after strain until finally he hit the jackpot have earned him well over 500 awards, including the coveted "gold jewelled pin" for Guppies. During his 80th year alone he won nine cups and a half a dozen or so shields, plaques, etc., all while he was kept busy lecturing and judging.

Society after society has covered him with honors: a Fellowship from the Guppy Breeders' Society, Founder Presidency of the Fancy Guppy Association, founder member of the F.G.B.S. and honorary membership of some half a dozen clubs.

Recently he achieved a life-long ambition to judge a fish show after his 80th birthday, but though he has now retired from active judging, he still keeps active keeping, breeding, and writing about fish.

On entering his home, "Goodwood House," one is immediately made aware by photographs and trophies of his varied career in the days when he was occupied in earning his bread and butter.

And let me assure you that Mr. Phillips's career has been as colorful as some of the many brilliant Guppies that he has raised in his more than six decades as a hobbyist. While still a boy he ran away from home and sailed to

WORLD'S FINEST AQUARIUM PRODUCTS



ONLY EUREKA MAKES AUTOMATIC FILTERS

Easy-flo
OUTSIDE
AQUARIUM
FILTER



High Speed... Instant starting - just attach air tube. Fits all tanks... full cover protection.

Completely new patented outside filter. Since this filter does not depend on a siphon for its water supply, it will continue to work efficiently even if the water in the aquarium evaporates and goes down an inch or two.

NO SIPHON TUBE NEEDED

MOIST PACK
WORLD'S FINEST FISH FOOD. Moist Pack for tropicals... contains highly nutritious blend... perfect for even the most difficult to raise tropical fish.

LIVER PROTEIN
LIVER PROTEIN is a special live food... WATER EUREKA. Sifts them from live food... separates particles... 10% to 20% protein. Not a dry mix... will not cloud tanks.

REMEDY and TONIC
Invaluable! Turns up fish, restores health, fights fungus and the amplexus. Easy to use. Shiny blue crystals... without discolor water.

HEALTH BAR

Manufactured by **EUREKA** PRODUCTS CO. HILLSIDE, N. J.
WORLD'S FINEST AQUARIUM PRODUCTS

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

opinion it breaks up too easily. Instead, plants in pots adorn most of the tanks, and after seeing some of these potted wonders I was inclined to believe with him that this was the best idea. Try catching fish in a well-planted tank and you too will agree the plants-in-pots method is better.

In 1954, being one of the first British fishkeepers to receive some of the then new albino guppies from Florida, he decided to try them for himself. One of his early crosses in November, 1954, was between an albino female and a gray male double-sword. This cross produced 68 fry, 17 of them the much awaited golden fish with red eyes. Determined to nail some of the stories current about these so-called "lethal" strains, he carried out a thorough

DEALERS!

Ask for Our Monthly Wholesale Price List

ON

TROPICAL FISH

Aquarium Supplies and Fish Foods

NEW IMPORTATIONS
of Rare Tropicals Arriving Regularly

»»»»»

PARAMOUNT AQUARIUM, Inc.

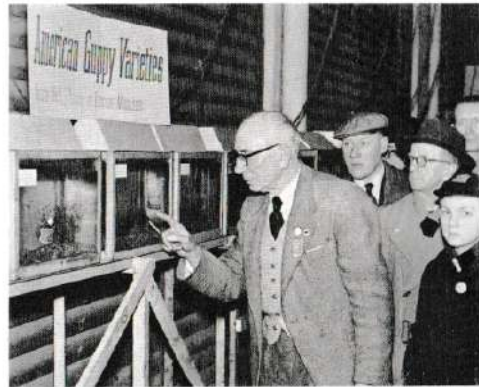
This advertisement appeared in April, 1964.

Paramount Aquarium has been supplying petshops and fish wholesalers for 30 years. We still have the most complete variety of imports and domestic livebearers at the most sensible prices. Please write for our complete wholesale price list on your business letterhead, the prices and variety will amaze you!



WHOLESALE ONLY . . .
WRITE OR CALL FOR INFORMATION

ARDSLEY, NEW YORK P.O. Box 627, Tel. OWens 3-4800-1
VERO BEACH, FLORIDA Municipal Airport, P.O. Box 277, Tel. JOrtlan 2-5487-4



Olympia, London. "Water Life" Show, 1958. Part of the Guppy setup showing American Guppies bred by Mr. Phillips.

series of breeding experiments and finally came to the conclusion that keeping these fish was no different from keeping the ordinary Guppy.

His answer to their so called 'lethal' genes was that all Guppies will deteriorate if allowed to inbreed promiscuously without rigorous culling, and as for their having bad eyesight, he found their eyesight to be just as good as other strains.

One of his friends to whom he had given some of that first brood was the late Dr. R. J. Affleck, of Borough Polytechnic, London, who endorsed George's findings to the letter, further proof, if proof were needed.

In the forefront of those seeking an international Guppy standard he recently wrote in the F.G.A. Journal that The International Federation of Aquarium Societies could help towards this end by declaring a standard expression to be used when describing the different Guppy varieties and that they could make a start with what the British and Americans call the Delta, whereas others call it the Triangle Tail (with further confusion in the quarters where the female of this strain is called Superba.) He suggests the photographs of champions in the Tropical Fish Hobbyist issue of June, 1961 as a basis to work from.

THE WORLD'S SALES LEADERS

There must be a reason . . .

Nearly 1 Million Sold!

Miracle Filters . . . first genuine under gravel biological aquarium filters.

OTHER MIRACLE PRECISION PRODUCTS

MIRACLE WATER SOFTENER
Eliminates all harmful scales of impurities . . .
Includes everything . . . \$3.49

MIRACLE'S MARINE TEST KIT
Measures water hardness, nitrite and nitrate . . .
76¢

SEND FOR 136 PAGE MANUAL
all you need to know about how to have a successful aquarium . . .
76¢

Sparkling Beauty Without Work

Whether you are an expert or a beginner there is a Miracle Filter for you. With either the Original or the Miracle Filter, you can be sure that your aquarium will stay sparkling clean with minimum care. Under gravel, out of sight, only Miracle Filter lets you enjoy the natural beauty of your prized aquascapes while maintaining the correct biological condition. Designed and patented on scientific principle, Miracle Filters are endorsed by expert hobbyists the world over. Be sure to insist on the genuine Miracle Filter or the Original Filter. You'll not be satisfied with less.

Sizes to fit all standard aquariums from **\$1.49**

Available at better pet supply outlets throughout the world.

MIRACLE FILTER COMPANY 64-5 PO Box 9128, Long Beach, Calif.

What used to be a garage at the side of his house contains rows of neatly arrayed tanks, about four feet from the ground; underneath are large tanks containing hundreds of young fry in all stages of growth.

The air of neatness is carried on to an opposite wall where nets and all paraphernalia associated with fishkeeping are hung in array.

From this fish-house have gone Guppies to all the corners of the world, and a framed testimonial from a famous London college thanks him for the help in sending them specimens.

British Guppy breeders in the past have often been accused of concentrating on finnage to the detriment of size, and since the broad tails have become so popular great strides have been made in Britain towards improving and developing these shapes, but one of the older types that we have excelled in has been the Coffer Tail, so called because of its similarity in caudal fin shape to the South Wales miner's shovel, or one half of the ace of diamonds. How Mr. Phillips developed this strain is a story in itself.

During the last war, he disposed of some surplus Guppies to a local dealer. Passing the shop again a few months later he went in to ask if the shopkeeper required any more. The dealer remarked that trade was bad and he hadn't disposed of all the original lot yet. Curious to see how they had developed, Mr. Phillips was surprised to see that the females had bright blue markings in their tail fins, and the shape of the males' tails was one he had never encountered before. His interest aroused, he did a swap back with the dealer; by trial and error, plus selective breeding over the next few years, he perfected what we now know as the Coffer Tail. At the close of the last war the Guppy Breeders' Society adopted this fish as a standard and awarded him a Fellowship for his work. This citation reads: "Presented for the production of the Coffer Tail Guppy," and is signed by the President and other officers of the G.B.S.

Truly, W. G. Phillips must rank with the best when we start handing out the awards for patience, perseverance, and sheer dogged determination to breed bigger and better fish . . . an example to all the young ones that keeping fish can keep you young in heart if not in years . . .

. . . After a short visit with this grand old fishkeeper, it left me, at 36, breathless.

READ IT NEXT MONTH IN TROPICAL FISH HOBBYIST

What Makes a Neon Tetra so Colorful?

BY DR. HERBERT R. AXELROD

due to our inability to keep our tanks from going up to room temperature. Perhaps you are or one of your readers is a refrigeration expert and can invent a "tank cooler." The man who patents such a device will surely make a fortune. Any ideas?

Robert D. Giles,
Ukiah, Calif.

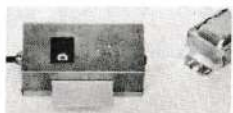
A. Haven't heard of your bi-metal refrigerator yet, but I like to keep up with these things. I saw some pretty outlandish contraptions in South America which ran without electricity but with a small kerosene flame used in the same manner as the gas flame in the old Electrolux refrigerators. If the method you mention is sound and the electrical consumption of a small unit is low, there are many possibilities for a small, compact unit which is noiseless and efficient, not only for an aquarium but for any number of things. You could, for instance, insulate and refrigerate a desk drawer, permitting a lunch or a bottle of soda water or some other beverage to be kept cold. I would hesitate to predict a fortune for the man who would perfect such a device for the sole use of cooling aquarium water, but its uses are manifold.

Algae.
Q. My tank has a bad case of algae on the glass and the gravel. I intend to

LIVE SEAHORSES FROM FLORIDA
Receive LIVE MATED SEAHORSES by Jet Air Mail PPG from FLA. Supply of food, our notes and simple instructions for raising these fascinating and exotic little creatures from the deep. All you need is water. The whole family, young or old will enjoy many hours observing these amazing aquatic performers. Educational, interesting, handy and easy to raise. Guaranteed Live Delivery.
\$3.50 A PAIR
\$7.00 SPECIAL—Order TWO PAIR and receive ONE PAIR FREE.
F. F. MARINE LIFE
P. O. BOX 626-TNH DANIA, FLA.

DEALERS

INCREASE YOUR PROFITS WITH GERM-OUT



Attached to any outside filter, Germ-Out's cleansing radiation rids the tank of harmful bacteria and germs.

As the water is circulated, Germ-Out's penetrating radiation destroys disease-causing bacteria and germs.

Fish stay healthy and hardy, live longer.

Germ-Out is easy to sell! Anyone who has lost fish needs the priceless protection of Germ-Out.

Retail price \$15.95. Act Now!! Write direct to manufacturer.

GERM-OUT

BOX 11 TC • WEST ORANGE, N. J.
Guaranteed — 1 Year.

change the gravel and clean out the tank. I was going to put in fresh water, but recently I read that the growth of algae would be stimulated in this manner. Should I take the chance of putting in fresh water? I am afraid that if I put in the same water it might have the bacteria that started the algae. What shall I do?

Marc Rothberg,
Philadelphia, Pa.

A. You'd be safer with the old water. Algae runs rampant when conditions stay it, but after a while there is no more nourishment for it and it goes into a decline. The use of fresh water would put you right back where you started, no matter how carefully you cleaned your tank. One thing we know: most algae thrives much less in water which has an acid content, so bring your pH below 7.0 and keep it there. If your water was alkaline, do this in slow stages or your fish will suffer.

FAT PENDING
"SNAP"
automatic
FISH FEEDER

Feeds fish or turtles once or twice a day up to 30 days according to your needs. Works on A.C. current.
All mechanical parts guaranteed 5 yrs. INTRODUCTORY OFFER ONLY \$9.95
The Carolina Co. 1748 Box 1323 Charlottesville, Va. 22902
SEND CHECK OR MONEY ORDER ONLY

AQUARIUM PLANTS THRIVE

and so do fish... when you use Plantabbs Aquarium Plant Foods.
Plantabbs Aquarium Plant Foods—liquid or tablets. Feed your aquarium plants in through feeding tubes. Healthy, beautiful to look at. Use 1 tablet to 6 gallons of water every 10 days or 1 capsule of liquid to 10 gallons of water every 15 days. Guaranteed safe!

PLANTABBS
AQUARIUM PLANT FOODS
Plantabbs Corp. • Baltimore 1, Maryland

PANAGRA
AQUARIUM

FOR QUALITY SERVICE • DEPENDABILITY
Tropical & Salt Water Fish and Plants
PANAGRA AQUARIUM-Box 5774 POMPANO BEACH, FLORIDA
Phone: 399-3843
Mgr., William Prendergast

Labyrinth organs.

Q. I am making a study of labyrinth organs as a science project, but I am having trouble. After doing a few dissections, I have not been able to locate the labyrinth. So far I have dissected *Helostoma rudolfi*, *Trichoptera trichoptera*, *Colisa lalia*, *Betta splendens*, *Macropodus opercularis*, and a species of Snakehead (I do not know which species or even if it is a labyrinth fish). Where can I find it?

John Hughes,
Pearl River, N.Y.



Snakehead

A. All that cutting up, and no labyrinth! In the *Anabantidae*, the labyrinth arises from the fourth gill arch and is composed of a set of superbranchial leaflike plates which afford a large absorptive area for oxygen. Your Snakehead belongs to the family *Ophicephalidae*. These have a much

simpler arrangement. They have a large superbranchial cavity lined with a wrinkled vascular epithelium which serves the same purpose. Hope I have helped you!

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

NEW! From the Creators of the 3-D aquarium background

Tank-Divider
INSTANTLY CONVERTS ONE AQUARIUM INTO TWO

Provides a separate area for baby fish. Allows for commercial dividers. Separates "rough" fish from peaceful community fish. Practically invisible—doesn't clutter appearance. Sets up breeding compartments in seconds. Prevents expensive plants from algae eating fish. Allows for complete heater circulation. Guaranteed non-toxic plastic.

Another product designed with the hobbyist in mind! **FRENCH FLAG** plantation, Inc.

4000 First Street, Boulder CO, 80501
AVAILABLE AT QUALITY PET OUTLETS EVERYWHERE!

Blue Platies.

Q. I have a pair of Blue Platies in a 10-gallon aquarium which I have had for two months. They have not spawned, though they are in good health. I would like to know whether Platies are good livebearers to breed, whether they are hardy and prolific, and why they haven't spawned.

David Sadevasser,
Hammond, Ind.

A. All Platies are hardy and prolific, and the Blue Platy is the most prolific and hardiest of the lot. There are a number of reasons why your female has not given birth as yet. If she is heavy with young, they might not have been able to get out because of a blocked passage. If she is not pregnant, she is either sterile or just "taking a vacation." There is also the possibility that your male is sterile, although sterility is difficult to imagine in a Blue Platy.

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

LIVE OCTOPUS

Fascinating, intelligent, hardy, full-grown, miniature (3" to 4" spread) Octopus. Red color. Complete with live food, synthetic sea water and instructions.

Airmail special, postpaid. Guaranteed live delivery (Continental U.S. only)
\$9.95

MARINE & TROPICAL FISH
P. O. BOX 1145
OCEANSIDE, CALIFORNIA
Dealers' inquiries invited on Marine Fish

West Germany's FAMOUS
TetraMin
TROPICAL FISH FOOD

The run-away best seller all over Europe!

Natural foods scientifically blended for every tropical specie. Gives fish new life, new vigor, new fertility. Never clouds water.

8 VARIETIES
AND 3 TYPES FOR EVERY FEEDING NEED

Admired by professional sportsmen the world over!

- Staple Food
- Growth Food
- Colorbride
- Hahnel Guppy Food
- Conditioning Food
- TetraMin Staple Food
- Staple Tablet Food
- TetraMin Tube Food

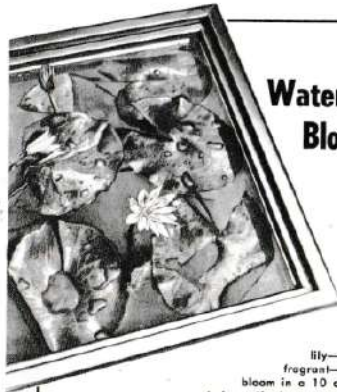
Ask for TetraMin at Your Favorite Aquarium Supply Dealer

Distributed by
Kordon corporation
Hayward, California

Female Swordtail with sword.
 Q. 1. Is it possible for a female swordtail to grow a sword? My neighbor has a green female which has developed a definite sword, extending about half an inch beyond the end of the tail itself. It is due to drop its young in a few days. I've had swordtails for several years but never saw one like this.
 2. How do you get rid of leeches, dragonfly larvae, etc., which seem to be in plants whenever I buy them? I

always rinse new plants in running water but lately I've seen all sorts of queer creatures in my aquarium. The one I called a dragonfly looked like a small brown twig such as might come from a pine tree. The next day I saw another "bug." This one had transparent wings and curved its tail. Then, last but not least, I found several little things which vaguely remind me of shrimp. They are the color of brownish white gravel and seem to swim back-

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



A Tiny Water Lily that Blooms in an Indoor Aquarium

After many years, we have developed a miniature water lily—perfectly formed and fragrant—which will grow and bloom in a 10 or 20-gallon aquarium indoors if given a sunny south window or "Gro-Lux" type lighting.
 "Margaret Mary" (pictured) is baby blue, gold center, with tiny floating pads of rich green. She is viviparous, producing minute copies of herself from leaf centers. Patent applied for.
 See the "Margaret Mary" and many other exotic plants and fishes in our 1964 FREE catalog. Write for it now.
THREE SPRINGS FISHERIES
 2754 Lilypons Rd., Lilypons, Maryland 21717 Phone: 301-874-3333



Mayfly nymph. Clean dipteran. The three feathery appendages at the insect's tail are used as balancing mechanisms.

wards, like shrimp. What are they? How do you get rid of these things without dismantling the whole tank? Mine is a 35-gallon and it would be quite a job. I feed my fish frozen brine shrimp at times, and when I showed this last "bug" mentioned to our local petshop dealer he was unable to identify it.

Mrs. P. Marabella, Douglassville, Pa.

A. 1. There are some swordtail strains in which the females sometimes develop short swords. Such females are considered inferior in any competition.
 2. Rinsing in running water is not enough to rid plants of undesirable "inhabitants." One system is to place the plants in a solution of a teaspoonful of alum to each quart of water for five minutes, then rinse. This system is not

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

NEW! CRYST-AL-WATER CAPSULES!

finally what you need for easy setting-up and maintaining of healthy, crystal-clear aquarium water for tropical fishes and goldfish!

C. A. W. CAPSULES do the job of five separate aquarium products at a fraction of the cost.

- 1) Adjust pH slowly to 7.0, without making water hard.
- 2) Neutralize harmful chlorine in tap water immediately.
- 3) Control algae growth.
- 4) Neutralize and adjust cloudy or foul water caused by overfeeding or overcrowding.
- 5) Provide fish with all necessary minerals.

Simple to use... merely add contents of one capsule per 2 1/2-gallons of water. Inexpensive... 8 strip-packed capsules per card—enough for 20 gallons of water—retails for only 79¢! Don't waste money any longer... specify CRYST-AL-WATER CAPSULES!

384 N. Dearborn, Chicago, Ill. 60610

DEALER: If you have not already checked our line with yours for best service, Trade-A-Rama Distributor, and our latest deals, visit us!



THE NEW... ALL-PLASTIC 4 VALVE GANG



Put an end to messy tangled tubing. Ideal for any size salt or fresh water aquarium... easy-to-reach adjustment knobs, with fingertip controls. **1.79**

COMBINATION WORM AND DRY FOOD RING



New molded, unbreakable plastic feeder ring rises up and down with the water level. Food can't flow over or be lost high and dry. **29¢**
 Divided into four sections. 2 open for dry food and 2 perforated for worm or large sea foods. Dotted color lets ring rise with water level... from a fixed position in the aquarium.

now you can keep TURTLES IN YOUR AQUARIUM



Now you can keep turtles in the same tank as your fish... and simultaneously clean up tanks over-ridden with snails. **89¢**

new... plastic ADJUSTABLE "SAUCER STONE" AERATOR



Completely new departure in aquarium aeration. Outperforms and outlasts air-stones. May be used with waack pumps... excellent for salt water fish. **59¢**

Tropical Fish HANDBOOK CATALOG
 A 40-page tropical fish encyclopedia... information on breeding, care, requirements, diseases... complete, authoritative, factually illustrated.
 ONLY **50¢**
 At your local dealer or order direct from:
AQUARIUM STOCK COMPANY, INC.
 31 WARREN STREET, NEW YORK 7, N.Y. 8070 BEVERLY BLVD., L.A. 4, CALIF.



Gammarus

justproof, but it still get most of the "bugs." The may-like insect was probably a dragonfly larva, and the other a mayfly in its final winged stage. You did not introduce the "bugs" with the frozen food. Brine shrimp occur in strongly salt water, and your creatures occur in fresh water. The "things" which vaguely remind you of shrimp are a species of Gammarus, which also occur in fresh water. Unless you are planning to spawn crayfishes, they are quite harmless and make a good food for whatever fish you might have that could catch the hard shells. These little crustaceans are the very devil to eradicate, because they are able to burrow in the gravel. They can catch and eat eggshells for, but otherwise do a fairly good job of scavenging.

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

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

WATER-RITE Ages Water Removes Chlorine and Other Injurious Chemicals Adjust pH IN ONE OPERATION



With Water-Rite, city water can be used at once... no more waiting for sleep, for not only does it remove residual chlorine, chloramine and other injurious chemicals but it adjusts the pH to a number of milligrams, thus making it safe for fish and aquarium life. Adjusts hard water for desirable fish life. Compatible with Fluorinated Water. Stops excessive plant growth and maintains a clean balanced aquarium.
START RIGHT WITH WATER-RITE
 Water-Rite sells 3 tablet vial—50¢. 12 tablet vial—\$1.49. 48 tablet vial—75¢. Also available in 4 oz. and 1 lb. powder containers.
 Available at most dealer outlets or pet shops.
 For More Information Write:
NATIONAL PET SUPPLY CO., St. Louis 3, Mo.

Salt Water Fish! Sea Horses, Angelfish, Gobies Butterflyfish: All Kinds



FAST DELIVERY! Little Waiting!
 Don't be fooled by dealers who offer cheap prices on marine fish. They can't deliver and will only disappoint you.
 Send \$1.00 for Sea Horse Book and Marine Pangloss. National Distributor for Reef Salt and Reef Carbon. Lowest price on Salt and Filter Medium. Dealer's version.
 Robert F. L. Strougan, Marine Collector.
CORAL REEF EXHIBITS
 P. O. BOX 10-2114
 MIAMI 19 (JAMP BR.), FLA.
 Ph. Miami, MA6064 6-2022
 Sent for free price list.
 "We deliver fish not promises!"

Guppy Corner



By Paul Hahnel

Half-Black Guppies.

Q. I have had in my Guppy aquarium a large female Guppy which was black from her middle to her tail, and the rest of her was white. She had babies and they turned out to be colored the same way as she was. She had several batches of young before she died. Now I have babies and some half grown youngsters just like she was; I looked through the books and nowhere are mentioned Guppies which are half black and white. When I talked to a pet shop proprietor about the matter, the lady told me that they bred fishes too, and that it was uncommon for a female to have babies just like herself. Is this so, and if it is will you please tell me if I have some rare Guppies?

Mrs. Beryl L. Irwin,
Lomita, Calif.

A. The fish you described goes by the name "Half-Black Guppy." As I remember, this type of fish was brought over from Germany several years ago. It is now a well-established strain here on the East Coast. At recent Guppy shows Half-Blacks were shown in a class by themselves. At a show in New Jersey a fish of this strain won Best of Show out of 250 entries. This will show you that it is a well-liked variety of Guppy, and your fish is probably from this same strain.

Albinism.

Q. About three weeks ago I noticed that three of my newborn Guppies were of lighter color than the rest. Upon examination under a magnifying glass, I found them to be genuine albinos, with pink eyes and dark reddish-

Teo Way Yang & Sons

Importers & Exporters of
Fancy Tropical Fishes,
Wild Birds & Animals
Shipments to Any Part of the
World

1063, Yio Chu Kang Road
Singapore 19

Cable Address:
"CATFISH" SINGAPORE

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

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

THE BRONZE DELIGHT

After more than 30 years of breeding exhibition guppies, Mr. Hartung now introduces his greatest achievement — the Bronze Delight with its large Vail-tail Dornia hue. They are a fine hybrid of golden and gray guppies. You may choose from Green, Leopard, Blue, Variegated or Blue-green tails. \$3.49 per pair, \$55.00 extra for Trio.

Other prize-winning varieties are your choice of Red, Blue, Black, Dark Blue, Variegated — only \$3.50 a pair. Albino Vails, \$2 a pair, beautiful Queen Baby and Vails \$9 a pair. GUARANTEED Live Delivery — Factory! Send check or money order to Wm. HARTUNG, Ft. 14 - 88th St., Woodhaven 21, N. Y. — Vt. 7-2538.

brown spots on their backs. I would appreciate it very much if you would answer these questions for me:

1. So far all three are very healthy and are growing normally, but do you think that they should be separated from the other young Guppies because of their weaker eyesight, to assure them of getting their fair share of food? I feed them three times a day with fine-sized dry foods.

2. If I get a male and female out of the three and mate them, will they have albino young?

3. Their father was a fancy Veiltail. If any of the albinos are males, will they also have long, flowing tails?

Steven Schiller,
Ft. Thomas, Ky.

A. A true albino has no color at all in his body. On the other hand, I have seen albinos with tail fins which were completely red.

1. Yes, you should separate them, and try giving them a bigger variety of foods.

2. Yes, mate them if you have a male and a female. There is a possibility that some of the babies will be like their grandparents, but if the chromosomes which are responsible for the color do not carry any color genes then you will have 100% albinos.

3. By the law of inheritance your next generation is supposed to carry through this feature.

Females with colored tails.

Q. In the September, 1963 issue of T.F.H. a reader named Thomas LaBros mentioned his green Veiltail females. You said it is very desirable to have females with colored tails. Some of my females have black and white tails. Is this desirable? Many of my females also have clear tails. I enjoy your column and "Mail Call" and usually read both of them first.

John Shubin,
Chicago, Ill.

A. It is advisable, as I have mentioned before, to use females with the most intense colors for breeding purposes, except black, unless you are working on a black strain.

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

"OCEAN-ML"
REASONABLY PRICED
Scientifically developed specifically for keeping marine fish healthy and lively in your aquariums.
For information, send stamped, self-addressed envelope to:
MEI LAN - Home of the Pacific Marine Fish & Super Remedy (the ONLY remedy for marine fish)
4625 FOOTHILL BOULEVARD
OAKLAND 5, CALIFORNIA

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

THE AQUA AQUARIUM AIR PUMP



- FREE OF BACT. AND TELEVISION INTERFERENCE
- PRECISION MADE IN WESTPHALIA GERMANY
- STEEL SHAFT
- DURABLE PLASTIC CASING
- 100% SILENT
- EXPERT CRAFTSMANSHIP
- CAN OPERATE HORIZONTALLY OR VERTICALLY
- ABSOLUTELY SUCCESSION
- SHIPMENT BY AIR AVAILABLE - SEND THE WORLD OVER

How long does this outstanding labor pump? 30 years. Have you ever seen that? It is the best pump value on the market today. If you succeed, then order from your dealer. If not available to you, write direct to:

RICHARD BARAU
P.O. BOX 100

Order from your dealer if not available in your area write direct to:

Nature's Frozen Fishfood Company

- Frozen Cyclops • Frozen Super Mix
Frozen Bloodworms (Red Wigglers) • Frozen Mosquito Larvae
Frozen Tubifex Worms • Frozen Roe • Frozen Daphnia

Packed in Individual Color Polyethylene Bags Net Weight 1 3/4 oz.

SPECIAL FOR HATCHERIES: PINT and QUART SIZES!

These foods contain Nature's own vitamins... for healthier, livelier and more colorful fish.

To feed, simply break a small quantity from the bag and drop in tank; the fish will do the rest.

ACTUAL SIZE



Wholesale Only... Write for Price Lists on Business Letterheads

Nature's Frozen Fishfood Company -

Box 390
Westwood, N. J.

Salts From
The Seven Seas



By Alfred A. Schultz

Q. I have a small hermit crab plus two very small fishes in a plastic aquarium. Last night I discovered that the crab had lost three legs. One is the well-developed leg. As of now the crab is still alive and appears to be doing well. However, he will not eat, nor has he for the last few days. Is this due to the loss of his legs? Also, have you any idea what could have happened? Right now there are no decorations in the aquarium or anything else that, as far as I can see, he could catch his leg on unless it is the frame of the aquarium itself. Will he grow a new set of legs, like a starfish?

Carol Brooks,
Tucson, Ariz.

A. The best you can get out of me is a guess. Crabs and other crustaceans have shells that do not grow along with the body; they must periodically shed these shells to grow bigger ones. At this stage they are soft and quite helpless, and take little nourishment. My guess is that the small shell which is the crab's home had become too small to give him the proper shelter and the fish picked off the three legs which he could not reach. In time these legs will grow back, and I suggest that you leave a few empty small shells of a little bigger size where your hermit crab can make a change to something more comfortable as the need arises.

Q. In preparing for a trip to the Florida Keys we hope to do some collecting by scuba diving. We need information on the following points:

1. What kinds of fishes would we expect to find, and what special information or techniques would we need to discover and collect them?

"NEPTUNE SALTS" KEEP
SALT WATER FISH ALIVE
FOR YEARS & YEARS!



World's 21st product for marine fish and sea horses. Tasted, discovered and used by experts at 20 public aquariums, over 98 universities, many government agencies, industrial zoos, and zoos throughout the world. Just mix with tap water... it's so simple as that. Crystal-clear water lasts 4 to 7 weeks and longer by actual experience. "NEPTUNE SALTS" lasts far longer than any other product ever developed since you buy it only once... do NOT bring in change water from every few weeks. 8-page instruction pamphlet free. Write for new salt water catalog, jobbers and dealers, no charge... back by air, 25c.

4 FREE TICKETS TO 1964
N. Y. WORLD'S FAIR
WITH EVERY 100-LB.
ORDER FOR
"NEPTUNE SALTS"
Johanna Daxland "Neptune Salts" 10th Anniversary gift. 4 free tickets with every 100-lb. order. 22 tickets with every 500-lb. N. Y. World's Fair, April 22-October 18, 1964. Bring the family for the vacation of your lives!

WESTCHESTER AQUARIUM SUPPLY CO., INC.
454 Monacauck Avenue, White Plains, N. Y.
Tel.: 914 WH 8-0011

Tropical Fish Hobbyist

2. What is the most satisfactory way of transporting fish when travelling by car through considerable changes in temperature?

Nancy Philippi, Freehold, N.J.

A. 1. Florida waters abound with many fish such as Queen and French Angels, Blue Grays, Sergeant Majors, and many others. Unless you are a skilled diver, I would suggest the much easier method: tidpool collecting.

2. If they are gradual and do not drop the water temperature below 50°, temperature changes will do little or no harm. The use of a vibrator pump which works on your car's voltage and plugs into the cigarette lighter receptacle is just the ticket for those long trips.

Q. 1. I have read that most fish can be kept with sea anemones because they can dodge the tentacles easily. Is this true with the Sargassum Fish, *Histioglossus*?

Sargassum Fish, *Histioglossus*.



2. Can a hermit crab be kept with a Sargassum Fish without being swallowed or harmed?

3. Can a sea anemone, a full-grown Sargassum Fish, and a full-grown hermit crab be kept in a 10-gallon tank with a subsand filter?

Paul Keller, Los Angeles, Calif.

A. No, to all three questions.

SETTING UP A SALT WATER AQUARIUM?

It's Easy and Economical With the New . . .

RILA SALTWATER AQUARIUM KIT

Complete kit contains every item needed to set up and maintain a beautiful marine aquarium.

3 bags Rila Marine Mix Salt Water pH Test Kit Hydrometer-Thermometer Comb.

Formula 'T' Liqui-Glass Revivo-Sal

3 page Instruction Booklet

Ask your dealer today or write for complete Product Information Bulletin.

RILA PRODUCTS
P. O. Box 114
Teaneck, N. J. 07666

Never Change Water With Dick Boyd's fabulous "Chemi-Pure"

Introducing the new sensational remedies . . .

AQUA-MARIN & MEDI-MARIN

Also acclimated marine tropicals and custom-built marine tanks. Dealers' and Jobbers' inquiries invited. Phone: 444-3263

This filter medium is a revolutionary departure from the old, mechanical filtration using glass wool, charcoal, etc. Chemi-Pure is a precise formula for use with either artificial or sea salt-water or fresh water, as a chemical absorbent filter, ion generator and exchange unit which constantly keeps off at perfect level, without adding chemicals to the water. Chemi-Pure REMOVES copper, metal ions-acids, odors and harmful gases AND neutralizes light and dark melanisms of fishes. Manufactured exclusively by:

CARIBBEAN MARINE ENTERPRISES, INC.
4775 S.W. 8th ST. (On the trail) MIAMI 34, FLA.

Wonderful for all Tropicals!

High Protein Food FRESH FROZEN For Better Nutrition



SAN FRANCISCO

GUARANTEED

FROZEN

PREMIUM

BRINE

QUALITY

SHRIMP

Brine Shrimp Sales Co., Inc.
1545 WEST WINTON AVENUE - HAYWARD, CALIFORNIA



For the finest nourishment your tropical fish will ever have—feed them Fresh Frozen Brine Shrimp from San Francisco. Give it to all your tropicals—and goldfish too—for improved natural color . . . for renewed strength . . . for new fertility. But be sure to buy the San Francisco pack—it's your guarantee of premium quality!

At Leading Aquarium Supply Dealers Everywhere!

CONFUSED BY CONFLICTING FILTER CLAIMS? READ THIS BEFORE BUYING ANY FILTER!

4 well-known outside filters VS SCATTERGOOD FILTERKING DELUXE

	G	H	L	W	FILTERKING
PATENTED Air Lift	NO	NO	NO	NO	YES
SELF-ADJUSTING Siphon	NO	NO	NO	NO	YES
RUBBER BULB instant-starting siphon	NO	NO	NO	NO	YES
FULL SIZE all-molded tank	NO	NO	NO	NO	YES
SELF-CLEANING by backwashing	NO	NO	NO	NO	YES
Full range of INTERCHANGEABLE slents	NO	NO	NO	NO	YES

OUTPERFORMS ALL OTHER OUTSIDE FILTERS! YEARS-AHEAD DESIGN IS FIRST CHOICE OF UNIVERSITIES, LABORATORIES, EXPERIENCED DEALERS — YOU, TOO! WHEN YOU WANT A REAL FILTER, ASK FOR A SCATTERGOOD, THE WORLD'S FINEST!

4 well-known undergravel filters VS SCATTERGOOD FILTERKING DELUXE

	E	H	M	W	FILTERKING
STUNTS PLANT GROWTH	YES	YES	YES	YES	NO
ACIDIFIES WATER	YES	YES	YES	YES	NO
WATER DISCOLORS	YES	YES	YES	YES	NO

OUTPERFORMS ALL UNDERGRAVEL FILTERS! A SCATTERGOOD operates as a WATER CONDITIONING plant, circulating water through a deep bed of activated carbon — the same principle used to provide high quality drinking water. When cleaning is required, ONLY THE FILTER TANK is removed and carbon back-washed, thus PERMANENTLY DISPOSING OF accumulated dirt.

Contrast with undergravel filters, which operate on a SEWAGE DISPOSAL principle — NO DIRT is removed, but instead is concentrated in the gravel. Periodically, regardless of claims to the contrary, THE ENTIRE PLANTED AQUARIUM MUST BE DISMANTLED and the gravel cleaned.

SCACO ACTIVATED CARBON The wonder-working carbon that SCATTERGOOD filters are designed to use. Gives water so clear that the fish seem suspended in space! Enormously more effective than bone charcoal, as proved by laboratory tests.

NO OTHER FILTER OF ANY TYPE IS "JUST AS GOOD" AS A SCATTERGOOD DESIGNED AND MANUFACTURED ONLY BY SCATTERGOOD FILTERS CO.

Get our complete line at quality dealers everywhere. If there is no Scattergood dealer near you, write for free catalog and booklet "Getting the Most Out of Your Filter".



Scattergood Filters Co.

MILLER 7, MISSOURI

May, 1964

This one may shock you!

The Electric Catfish

BY PETER CHILPATY
Munich, Germany

This highly interesting fish came into my possession at a size of about 1½ inches, although in its native tropical African waters it is said to attain a size of almost 3 feet. Mine grew to 10½ inches in length in six months.

The body shape is elongate, plump, with a fat head and tiny eyes which can glow in darkened surroundings. The dorsal fin is lacking and the pectoral fins do not have hard rays. There are three pairs of barbels. What makes the fish particularly interesting is the possession of paired electric organs imbedded in the tough skin on both sides of the body so that the entire rump is surrounded. I will go into this more closely later. The color is very modest: the back is grayish brown, the underside yellowish white. There are many dark blotches and spots scattered over the back and head and at the caudal base there is a broad pinkish band to relieve the monotony of coloration. There are no known sex differences. It is said to be a mouthbreeder. It is very quarrelsome with other fishes and extremely greedy. In the daytime it spends most of its time hiding and does not come out to show much activity until nightfall. I keep mine at temperatures from 74 to 80°.

Feeding is with earthworms, mosquito larvae, *Tubifex*, white worms, and small fish. The fish is very trusting and tame; as soon as I approach the aquarium my Electric Catfish swims to the surface immediately, takes his position at the place where he is always fed, and plucks the food from my fingers.

The electricity-producing organ is used somewhat like a radar installation for orientation (his eyesight is quite poor) and also to hunt for his food. The Electric Catfish belongs to the so-called "high voltage class" of fishes which are characterized by a soft, slimy, naked, and scaleless skin.

Now let us go more closely into the description of the electricity-producing organ. The weight of this organ is approximately ¼ the total body weight. It is composed of a more or less large number of cells which in many ways differ from the other body cells. They are laminated and each individual cell (also called a disc) is connected on the flattened side with nerve fibers, the number of which depends on their type, and which can vary greatly from the ordinary ones. Over a distance the nerve tissues of the discs unite with neighboring ones, ending in the nerve canals of the spine. The electric disc is distinguished by a great quantity of cell bodies which are imbedded in a jelly-like mass. They are the elements of the electric organ which can be compared to an electric battery.



The most striking feature of the Electric Catfish's coloration is the white band sandwiched between black areas of the caudal peduncle. Photo by Dr. Herbert R. Axelrod.

It is known that the electric organ of the Electric Catfish is composed of two million such discs. How the electric current is generated in these discs is the subject of a number of theories. One of the best known of these is the membrane theory which states that because of the membrane limiting

One reason for the Electric Catfish's weak eyesight is the size of the eyes in comparison to the total size of the head. The fish is almost blind.



potential which occurs in the nerve fibers and plates of the organ this electrical energy results and is stored in the lamellae of the electric organ as it would be in a condenser where it is discharged at the fish's will. These commands are transmitted through the nerve "lobus electricus" which has its center beneath the rhomboid depression in the after region of the fish's head. The strength of the current delivered by the Electric Catfish is about 350 volts (the Electric Eel can approach 600 volts). The amount of discharges varies. It always depends on the impulses, which are gathered in series. These can go as high as 280 per second with the Electric Catfish. When irritated repeatedly, signs of weariness become apparent, and exhaustion may follow. With the Electric Catfish the tail end is positive and the head negative. With its electric shocks it can kill or stun aquatic creatures near it.

I would like to give one more instance of the effect of these shocks. When my Electric Catfish had attained a length of 2 1/2 inches, I moved both of my Spiny Eels from my Africa tank into his quarters. The Spiny Eels immediately looked for a place to hide. The larger of the two streaked into the cave which was occupied by the Electric Catfish. Hardly had it disappeared inside when it came flying out again. It was a real retreat, as if it had been ejected forcibly. Not only that, but a stone about 2 inches thick which had been serving as a roof for the cave went flying too. The large Spiny Eel, at that time 9 1/2 inches long, had gotten such a jolt from the little Electric Catfish that both he and the rock went flying as if shot from a cannon. The second Spiny Eel, after I had replaced the stone, met with the same unhappy experience. Both were so upset that although normally greedy, they accepted no food after that. Ten days later I had to put them back in their previous location. I am really very curious to see what further surprises this fish holds for me.

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

**BRAZIL'S BIGGEST & MOST DEPENDABLE EXPORTERS
TROPICAL AQUARIO LTDA.**

Caixa Postal 1319
Sao Paulo, S.P.,
Brazil

Most attractive prices for both popular
and rare Brazilian species.

FOR **METAFRAME** Hobbyists

WHO APPRECIATE THE FINEST

1st
in
HOBBYISTS'
SALES



Discriminating hobbyists rely on the famous METAFRAME quality and craftsmanship which for 30 years made METAFRAME a household word, respected and admired by all.

Strict quality controls assure trouble-free service by all METAFRAME products. The METAFRAME aquarium cement is suitable for fresh and salt water usage.

Only the finest material goes into all METAFRAME products, sold by better pet shops across the country. Look for the METAFRAME name and be sure of the finest.

Metal Frame Aquarium Co.

87 Route 17, Maywood, N. J.

May, 1964

A review of the Chilodinae, with a key to the species

Continued from Page 10

The following key is only tentative. It is chiefly intended to give a re-description of the essential characters of the species, which were never revised, despite their biological interest. They are deserving of more attention than I could bring up here. Two of the included forms, *C. labyrinthicus rapununi* and *Ch. punctatus zunevei*, are not well known. A third one, from the Japurá, photographed by Harald Schultz but not preserved, is classified here as a *Chilodius*. In the original photograph, it seems to have more than 7-8 branched anal rays. Save for this anal rays count and the spots on the dorsal, its characteristics and coloration are those of *Caenotropus maculosus*.

III. TENTATIVE KEY TO THE CHILODINAE.

- a. Mouth distinctly inferior, with thin lower lip, the dentary included; pharyngeal teeth rather large and relatively few; scales crenulate (adults); predorsal rounded, except just before the dorsal fin; post-ventral rounded; depth 3.20-3.66 in the standard length; peduncle elongate, its depth 1.1-1.3

Fig. 2. Fifth and fourth branchial arch of *Caenotropus maculosus*; above, detail of the pharyngeal teeth; below, same enlargement of the corresponding pharyngeal teeth of *Chilodius punctatus*; right side, lateral view (except for the pharyngeal teeth corresponding to the inner part of the fourth arch, which are being seen from the interior).

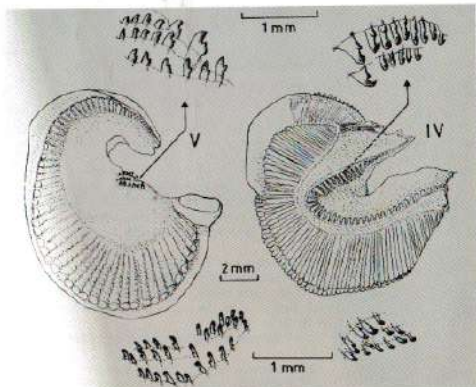




Fig. 6. *Chilodus punctatus punctatus* (Photo by Kremer).

in its length; interorbital 2.5-3.8 in the head; anal iii, 7, i or iii, 8, with a concave border; pectorals i, 14 or i, 15; a caudal band, dorsal never spotted; rather large size, up to 140 or 150 mm. in total length. (*Caenotropus* Günther).

b. Head 3.6-3.8 in standard length; snout-to-dorsal 1.26-1.45 in dorsal-to-caudal; adipose fin above the first rays of anal fin; gill-rakers 19-23; at least 29 perforated scales (counting all) and 9 post-dorsal ones; 17 branched caudal rays; generally no teeth on the lower lip, or, if present, only 1 or 2 rudimentary ones.

c. Scales $4/29/3/$ or 4; predorsal 6 or 7, post-dorsal 9; snout-to-dorsal 1.35-1.45 in dorsal-to-caudal; longitudinal band not interrupted; an oval or round humeral spot overlaid on it, ending at the level of the origin of the dorsal; first rays of dorsal fin dark, without definite band or spot, iv, or iii, 9.

... *Caenotropus labyrinthicus labyrinthicus* (Kner, 1859) Fig. 3 (Ries Orinoco, Branco, Negro, Amazonas, Tapajós, and Paranaíba).

WIL-NES® *Introduces the NEW*

aqua -vac

**BATTERY POWERED
AQUARIUM
VACUUM CLEANER**



*A Clean
Aquarium For
Healthy Fish*

- Sweeps Clean
- Separates Dirt from Gravel
- Removes Uneaten Food
- Keeps Aquarium Water Crystal Clear
- Disposable Filter Bags

\$ 3.98
Retail



Habitats: Send \$10 for our new 38-page catalog of aquarium and accessories available at your dealer.

Order: **WRITE WIRE PHONE**
FOR OUR NEW CATALOG
Request free copy, using letterhead.

America's Leading Brand of Fine Aquarium Products

WIL-NES
BY ROUTE 17
MAYWOOD, N. J.
AREA 201 261-2200

© 1964 AQUARIUM INDUSTRIES