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FISH

THE AQUARIUM

ISSUED IN THE INTERESTS
OF THE STUDY, CARE AND
BREEDING OF AQUATIC LIFE



PARATILAPIA MULTICOLOR.

The body, tail and fins are marked with yellow, violet, red, blue and green, and the fish looks as though adorned with precious stones, — indeed it is a regular living gem.

Drawing from life by E. S. R.

Smithsonian Institution
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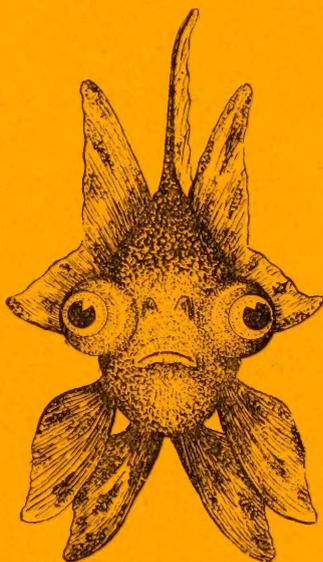
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DRAWING BY H. T. WOLF

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PLATE I
THE NEW YORK AQUARIUM
EXTERIOR AND INTERIOR VIEWS

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THE AQUARIUM

VOLUME I

FEBRUARY, 1913

NUMBER 9

The New York Aquarium.

JOHN TREADWELL NICHOLS, New York.

THE New York Aquarium, at the southern extremity of Manhattan Island, looking out across the harbor, was originally built as a fort with walls eight feet thick, and within the narrow compass of these walls it has been difficult to arrange the proper tanks, piping, etc., for a big public aquarium. The building has been open as a public aquarium since 1896, and in 1902 came under the management of the New York Zoological Society. Since 1902, Dr. Charles H. Townsend has been director, and there have been many changes made, — notable improvements in lighting and ventilation, and the introduction of a large storage tank for pure sea water, as the impure, somewhat brackish harbor water, pumped through a well, was unfit for many of the fishes.

The aquatic animals in the Aquarium are shown to the public in several large pools in the floor of the building, the largest thirty-eight feet in diameter, and in glass-fronted wall tanks, the largest seven and one half feet across. There is also a gallery where smaller wall tanks are shown. By means of a steam plant, the water is warmed to satisfy the tropical fishes in winter, or cooled to be right for the northern species in summer. Under the building is a reservoir for pure sea water which has been brought from outside the harbor. This is pumped to the exhibition tanks and thence falls through sand filters back to the reservoir. Brackish water for the large floor pools is pumped from the bay through

a well under the building. The pumps run day and night, and there is an emergency pump to connect with either harbor or storage system when one of the regular ones is out of order. Flowing fresh water is from the city's water system, and an air compressor furnishes extra aeration wherever necessary. Supply pipes to the tanks are of vulcanized rubber, and drainage pipes to the salt water reservoir of iron, lead lined.

The tanks are about equally divided between fresh and salt water. The fresh water food and game fish — trout, whitefish, bass, pickerel, muskallunge are always on exhibition. Through co-operation with state and national fish hatcheries, the Aquarium is able to show the commercial methods of hatching certain fishes, as well as the growth of their young. Eggs are obtained free, and in return the fish raised from them later planted in various waters. Particular success has been obtained in hatching whitefish eggs in automatic glass hatching jars and rearing the fry by feeding them mosquito larvae. Through the top of such a hatching jar, two glass tubes enter — one, for the supply of running water, extends almost to the bottom of the jar, the other, for outlet, reaches only a short distance below its mouth. The semi-bouyant eggs are continually rolled over each other by the current of water, and a circulation in the egg mass is set up, up along the outside of the jar and down in the center. Thus each egg comes in turn to the top. Any dead eggs, because

of their different specific gravity, accumulate above the mass and may be taken out in the escaping current by pushing the outlet tube down to them. As the fry hatch, they automatically leave the jar in the outflow.

Of salt water fishes, the more interesting species found near New York have most of them been shown at the Aquarium. The little sea horse, clad in an embossed coat of mail, looking like a knight of the chess board, propelling itself slowly forward in an erect position by means of its back fin, and hanging on with a prehensile tail, is commonly found there; also skates and flounders, the former flattened from above downward, the latter from side to side, and both matching the bottom on which they lie. Large sharks, the jewfish which is a gigantic bass caught by sportsmen in the south, and other species, are kept in the large floor pool.

But of all the marine fishes, the most interesting and beautiful are the bright colored tropical species brought from the coral reefs of Bermuda, among them gaudy wrasses and parrot fish, big-eyed red squirrel fish, the blue and yellow angel fish with its long streamers, etc. The bright colors of coral reef fishes have long been the wonder of naturalists. The theory that they harmonize with the color of the reef, and that the reef in itself is a veritable many-hued flower garden, is not satisfactory, for in fact the tones of the coral are more often monotonous than bright. But the reef supplies them with infinite corners and crannies to dodge around and into, if pursued by larger fishes, and they can therefore flaunt with impunity bright colors which would be suicidal if carried over open stretches of sand.

The Aquarium contains many aquatic animals which are not fishes. There are always a goodly company of salamanders, turtles, etc., up to the giant sea

turtles, with paddles instead of feet, which are flapped like the wings of a bird. Starfishes, various species of crabs, the flower-like sea anemone, and many other creatures large and small are on show at the right seasons.

The big, active seals are a constant source of joy to visitors. Of these the most notable which have been shown successfully are young specimens of the valuable Alaskan fur seal and the remarkable sea elephant from Lower California. By contrast, tanks of minute animals, attractively arranged behind large magnifying lenses set in board, place within sight of the general public such forms as mosquito larvae, as little known as though they inhabited the antipodes.

For variety and extensiveness of its collections, the New York Aquarium stands foremost in the world. Let us hope that it will expand into larger quarters, as its present cramped ones do not leave adequate space available for laboratories etc., and thus shut it off from certain fields of usefulness.

The Violet in Aquaria.

Rev. C. KELLER RUBRECHT, Milwaukee.

ONE does not expect violets to be classified with aquatic plants, yet there is no prettier and more interesting little plant for the aquarium than *Viola blanda* (possibly *Var. palustriformis*), the little Sweet White Violet, found almost every where in damp places in our woods.

Last summer we found them growing abundantly under water in a swamp. We took a number of specimens home and planted them in our aquaria where they still thrive. They seem to enjoy their gravel bed under water and form neat little colonies which give the tank an unusually attractive appearance. The plants retain a dark green color rivaling that of the giant *Sagittaria*. Its identity in the aquarium will deceive many an expert botanist.

The Mouthbreeders

C. J. HEEDE, Brooklyn.

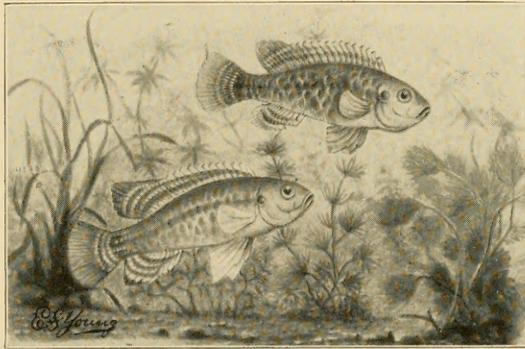
THE mouthbreeders, *Paratilapia multicolor*, belong to the fish family called Cichlids. They are found wild in ponds near Alexandria, Egypt, and were first introduced into Europe as an aquarium fish at the beginning of this century. Their size is about two to two and a half inches long. The female is more heavily built than the male in the fore part of the body, especially back of the head, where the breeding bag is located. In this bag first the eggs, and later, when hatched, the young mouthbreeders are kept.

The color of the male of this species is very beautiful, especially at the breeding time. The body, tail and fins are marked with yellow, violet, red, blue and green, and the fish looks as though adorned with precious stones,—indeed it is a regular living gem. The male has a red spot on the anal fin; the female is without this red marking, and otherwise not so well colored.

The temperature of the water in the aquarium where mouthbreeders are kept must not be under 65 degrees Fahrenheit, in breeding time 75 degrees. When the female is about to produce her eggs, as can easily be seen by her enlarged body and head, the pair build their nest—a shallow hollow in the sand—between the plants at the bottom of the aquarium. The bottom of the aquarium must be covered by about two inches of sand, and no clay or soil should be used, as otherwise the fishes will make the water muddy in arranging their nest.

After the female has laid her eggs, the male fertilizes them, and then the female gathers them into her mouth and by moving her jaw as if she were chewing something, constantly keeps fresh water circulating around and between them until they are hatched. This takes from fifteen to twenty days, during which period the mother fish will not take any food.

The number of young varies from ten to fifty, or even more. Like the young of other spawning fishes, their first food is infusoria. The young fish go out to hunt this food, particularly at night-time, and when frightened, swim back into the mouth of the parent fish. In a few days they will be able to care for themselves, and the mother fish must then be taken out of the aquarium, as otherwise she might attempt to eat her young. At the time when the mother fish takes the eggs in her mouth, the male must be



PARATILAPIA MULTICOLOR.

Drawing from life by E. S. YOUNG.

removed from the aquarium where his mate is confined, otherwise he will disturb her in her work of caring for eggs and young. It is not advisable to let the fishes breed more than twice in a season or it will weaken them, especially the female, on account of the fasting while the eggs are in her mouth.

These fishes are generally kept by fanciers, not alone for their beauty of color, but also for their highly interesting breeding habits and their hardiness. In the aquarium they should be fed, besides fine aquatics such as *Riccia* and *Salvinia*, live food as *Daphnia*, *Cyclops*,

etc., raw, finely scraped meat, finely cut up worms, or rich artificial food.

Another mouthbreeder, called *Tilapia natalensis*, from South Africa, has lately made its appearance in our market, but is not quite so beautiful as the first mentioned kind, and breeds in exactly the same way. However, it does not need quite so high a water temperature, and can therefore be bred successfully without artificial heat.

The Dogfish.

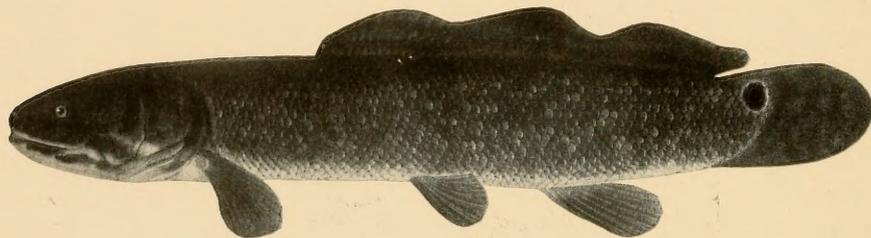
W. A. POYSER, Hammond Indiana.

THE rambler by river, lake or swamp, be he on fishing bent, may find the sole survivor of a primitive family of fishes — *Amia calva* — a species of much interest. Like others

caudal ocellus (shown in cut) distinguishes the male, though it is present in the female, but very indistinct.

With the coming of spring, the male builds the nest, unassisted by the female, making a bed of soft rootlets, sand or gravel for reception of the eggs. This operation, as well as spawning, is said to take place at night. The fry emerge in eight to ten days, remaining in the nest about nine days, attaching themselves to rootlets by the adhesive organ on the snout, or lying in the bottom of the nest. The male guards the nest and remains with the young until they have attained a length of about four inches.

The dogfish is exceedingly voracious and in the aquarium should be segregat-



DOGFISH, *Amia calva* L.

of frequent occurrence, it bears numerous names in different parts of its range. Here we find it as the dogfish, elsewhere as the bowfin, grindle, mudfish, mud-jack, etc.

Amia calva is one of the few lung-fishes found in the United States. It comes to the surface to breathe, as can be noted, even when it is young. This species is remarkable for the presence of the cellular air-bladder and other ancient characters. It is not particularly attractive either in shape or color, but has other characteristics, good and bad, that make it of interest. In color, greenish-brown above, lighter on the sides, merging into cream on the belly. A mingling of the colors gives the fish a mottled appearance. The dorsal fin is marked by two dark olive bands. A

ed, or kept with fishes much larger. It is not particular as to environment and will flourish under any conditions. It attains a length of two feet. Only very young specimens are desirable.

The accompanying illustration is reproduced by permission from *The Fishes of Illinois* by Forbes and Richardson, to which the writer is indebted for the notes on the breeding habits.

It is a remarkable fact that no salmon inhabit any of the rivers that fall into the Indian Ocean. This widely distributed order of fish is, however, found in all the rivers of Central Asia that flow north and west. The nature of the tropical ocean into which the rivers flow, is no doubt the proximate cause of the absence of Salmonidae in the south.

A Simple Device for Heating the Aquarium.

Dr. FREDERICK SCHNEIDER, Brooklyn.

MUCH has been said and many schemes evolved to heat the household aquarium. I have tried many methods, but a most simple device planned by a friend in Germany has proven the most successful.

Any aquarium may be made a "heated aquarium", provided it has a metal bottom, with but little outlay, and maintained with the minimum of attention. Cut from a piece of sheet zinc, or any suitable metal, a funnel-shaped cone (see drawing), measuring six inches in diameter at the base, and three inches high. The apex of the cone should be cut off leaving an opening seven-eighths

of an inch in diameter. On opposite sides and midway between top and bottom, cut holes of the same diameter as the top as shown in cut. Of the same metal make a pipe or tube one and one-quarter inch long to fit the terminal aperture; and two pipes of the same diameter to fit the side holes, but sufficiently long to extend at least half an inch above the plane of the central tube. Solder the three tubes in the proper places, then put the finished cone in the middle of the aquarium and solder to the bottom. Cover the ends of the tubes with fine wire gauze to prevent the entrance of fishes or particles of food and dirt.

The tank should now be raised high enough to place the source of heat

under it. As a heater I would suggest the small German Bunsen burner called "Kolibri", but any small Bunsen burner with a blue flame will do. If gas is not convenient an alcohol lamp, or an oil lamp may be used. After filling the tank with water, raise it to the proper height and place the burner under the middle of the cone.

After lighting the burner you will notice that the cold water enters the top or middle tube and comes out warm from the side openings. All the heat is taken up by the water in the cone, and none escapes beyond the circumference, provided, the flame is centered under the cone.

The plants and their roots are in no danger, as no heat will be transmitted

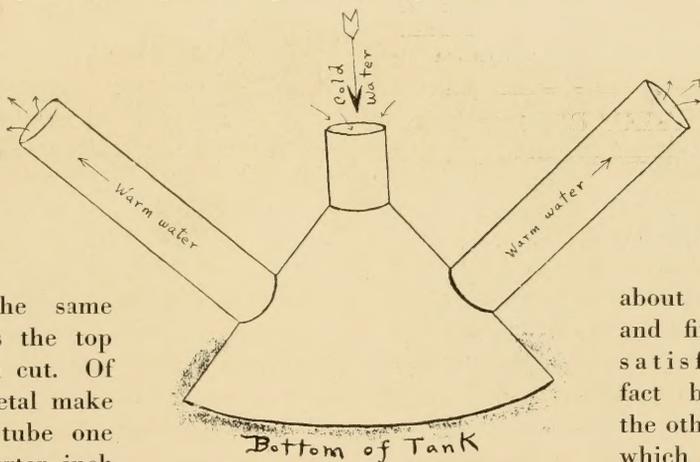
beyond the edge of the cone except through the water. I have used this method for

about six months and find it very satisfactory, in fact better than the other methods which I am also using. If gas is used

as the source of heat but little attention is required. The temperature of aquaria in one room may be varied by reducing or increasing the supply of gas to the burner.

"Even without going from our own neighborhood, or withdrawing from spots with which we have been long intimate, much may be learned in addition to what we yet know. It is not always the animals that we are most familiar with by name and frequency of occurrence whose history we understand the best".

Rev. L. Jenyns.



Sketch Showing Circulation of Water.

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EDWARD F. Bigelow, Arcadia, Sound Beach, Connecticut, desires for the "Nature and Science" Department of the "St. Nicholas" Magazine (New York), photographs of interesting inventions, and of natural objects that are novel, instructive or especially beautiful. He particularly desires photographs of machines or mechanical appliances of interest to the readers of "St. Nicholas". They may be mounted or not, of any size and on any kind of paper. The only requirements are that *they shall clearly show something worth showing*, and be interesting or instructive. Do not send "snap shots" of scenery that can be equalled for beauty and for general interest in almost any part of the earth. Pay will be at the usual magazine rates, and will vary with the interest and the novelty. A small photograph may be more valuable than a big one.

"The Guide to Nature", Arcadia, Sound Beach, Connecticut, is a magazine for adults, and has a definite purpose. It is published by an association of students and lovers of nature — not for pecuniary gain, but to be helpful. Its department, "The Camera," is conducted by enthusiastic camerists, each of whom, as in a camera society, desires to help all his associates and colleagues. Editor, associates and contributors are paid by the satisfaction of benefitting others. There is no better remuneration. All income is devoted directly to the interests and improvements of the magazine. You are invited to cooperate. Subscription; \$1.00 a year. Single copy: 10c.

How to Construct a Breeding Tank of Wood.

H. R. LIPPINCOTT, Philadelphia.

WITH spring approaching, the thoughts of the amateur fish breeder naturally turn to the spawning season. Few are fortunate enough to possess greenhouses with cement tanks where this operation may take place, hence it behooves the rest of us to look about for suitable receptacles for our purpose. This generally results in a miscellaneous collection of tubs, pots, pans and jars that lend anything but an artistic touch to the garden and lawn. Too, this motley collection of non-descript utensils usually excites strenuous objections from the feminine side of the house. The aquarist has enough trouble that cannot be avoided, so it is best to side-step this issue by adopting neat and uniform tanks.

Cypress lends itself admirably to our purpose, being a tree whose habitat is in very wet places. This wood resists the action of water far better than others, is inexpensive — costing about six cents per board foot — and being a soft wood is easy to work. The construction is exceedingly simple as shown by the

illustration, and anyone who is even moderately familiar with tools can make as many tanks as are required.

Any size tank may be made, but I find that the sizes considered are most satisfactory, and the lumber cuts to an advantage with but little waste. The large tank measures 30 inches wide, 16 inches high, and 48 inches long. The smaller one 24 inches wide, 9 inches high, and 32 inches long. For the larger tank $1\frac{1}{4}$ inch lumber is used, which, when dressed, is about $1\frac{1}{8}$ inches thick. Here I use a board 16 inches wide, thus

a voiding seams in the sides or ends and but one in the bottom. The side and bottom boards, though it is not shown in the cut, have been rabbeted to a depth of a quarter of an inch for the reception of the ends. The bottom boards are tongued and grooved. All

joints are painted with white lead just before being put together. The tank is then set up, clamped, and $1\frac{1}{2}$ inch screws inserted through the sides and bottom into the ends. A strip 3 inches wide and as long as the width of the tank is screwed tightly to each end of the bottom, and a similar strip in the middle. Strips of this width are secured in like manner to each of the end boards, thus insuring against warping. An iron rod one quarter-inch thick, threaded at both ends, is now passed from side to side at

each end of the tank and secured with nuts. This completes the large tank. The smaller one is identical, except that the iron rods and the strip across the middle of the bottom are omitted. This method of construction gives a strong, neat and substantial tank that will last for years.

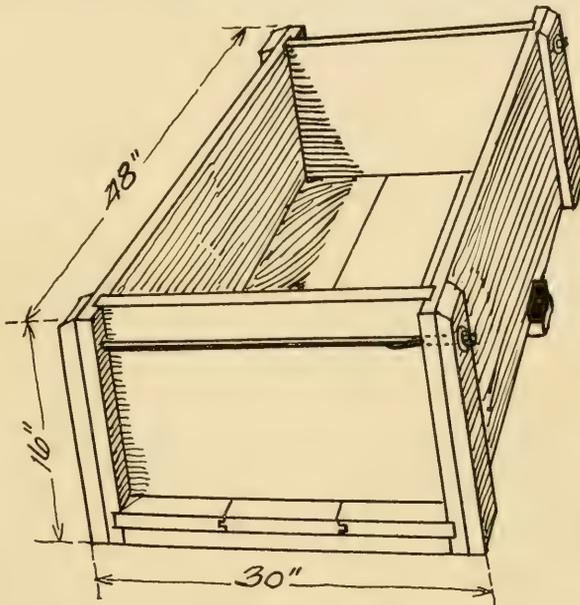
Painting improves the appearance, but fills the pores and prevents the necessary evaporation of the water absorbed by the wood, thus causing decay much earlier than if the tanks be left to weather, unless some preventive be used. Paraffine, chipped into the tank and thoroughly ironed into the pores of the wood with a hot sad-iron will prevent the absorption of the water. This should be done once a year. Five tanks constructed and treated as described have been in use by the

writer for four years and show no signs of decay.

"Nature is a great artist, when she is left to herself to suit her means to her end". *Lamartine*. It is highly improbable that goldfish breeders will concur.

Slovenly and careless habits of study will hinder progress exceedingly; and those who in the beginning skip difficulties, or are satisfied with guesses, will always be impeded by doubts.

Notcutt.



A COMPLETE TANK
Drawing by L. M. Dorsey, Jr.

The Aquarium.

A Series of Articles on the Construction, Equipment and Maintenance of Aquaria, and the Breeding of Goldfish.

C. G. B. SCHENK, Milwaukee.

I. *The All-glass Aquarium.*

THE title selected for this series of articles has been used many times before, but as it seems to be the most appropriate, I have decided to use it again. In these articles my ambition is to help the novice who has never tried to keep fishes in an aquarium, but would like to do so, and the one whose attempts in this direction have not been very satisfactory.

There are many books available in the public libraries on the subject of the aquarium; and most of them are worthy of careful reading, but the majority of the authors have failed to consider sufficiently the little details which every amateur must learn before he or she will be successful in keeping aquatic pets alive and in a healthy condition. In these articles I will try to make everything as clear and simple as I possibly can, so the beginner can go ahead with confidence in himself and success in his efforts.

Before going further let me assure every reader that there are no secrets to this "hobby." Should you not fully understand what is set forth in these articles you are privileged to use the "Comments and Queries" department of the magazine to your heart's content. This section is for the purpose of answering questions, so don't be backward in sending in your questions on matters you are in doubt about.

To those who have passed the infant class in the study of the aquarium, and have graduated with honors, these articles are not written. They are intended for the beginner. However, I hope even the expert may find something "new" to

him which will be at least interesting and worth while.

The first important step to consider is the vessel in which we are going to keep our fishes. This is generally called the aquarium. Anything that will hold water will house live fishes, provided, it is chemically clean. By *chemically* clean, I mean a vessel that will not throw off poisonous substances. For instance, galvanized pails, pans, etc., are not suitable on account of the galvanized iron throwing off a poison which would be fatal to your fishes. Fibre tubs are excellent.

The best aquarium is the oblong metal frame with glass sides and ends. The worst that I can at this moment think of is the round glass globe which we see so often in bird stores and every other place where fishes and aquarium supplies are sold.

Three types of all-glass aquaria can readily be purchased in the open market. Of these three types, the round shape most commonly seen is the worst; the cylinder shape is next best; the oblong shape best of all. Of the last mentioned kind, those imported from Germany seem to be the best made. They are usually marked "Made in Germany", blown into the side.

If an all-glass aquarium is considered, let me caution you that they are liable to breakage from changes in temperature. Too, the all-glass oblong tank is expensive in the larger sizes. If such an aquarium is decided upon, be sure to put a pad of one-half to one inch thickness of felt underneath to prevent breakage as much as possible. These pads can be purchased from any one selling the tanks. There are several advertisers in this magazine who sell the imported all-glass aquaria in all sizes. Price lists can be had by writing for them. (Please mention THE AQUARIUM when requesting catalogs or other information.)

(To be continued.)

The next article will consider the various styles of metal-framed aquaria.

Feeding Goldfish.

WM. T. INNES, Jr., Philadelphia.

A GREAT number of good and kind people are very much worried as to *what* they should feed goldfish. This really is a subject of some importance, but not as important as many imagine it to be. Considerations of *how much* to feed, and the conditions surrounding the goldfish—plants, light, temperature, air surface of water, etc., — are tremendously more important to the health of the inhabitants of the aquarium. Having a rather large aqua-terrarium at my place of business I naturally get on the aquarium subject with persons of all degrees of ignorance on fish-keeping lore. Scarcely a day passes that someone does not ask "What shall I feed my goldfish?" My stock answer is "Anything they will eat." Of course, this answer requires an explanation, but in itself is intended to convey two facts; that the range of acceptable food for goldfish is very large; that the subject is not of as much importance as supposed. A gentleman who has been a practical aquarist and a leading authority for a quarter of a century told me that he feeds his fish almost anything from the kitchen or table which is not too greasy, including cake! His fish are in large, shallow indoor tanks in which there is a profusion of healthy plant life, and an abundance of water. In a household aquarium of the ordinary type this haphazard method would not do, but nevertheless it is still true that if an aquarium is right, the fish may be fed on anyone or all of a score of foods, *particularly if they are not given too much*. Nobody would think of feeding goldfish on pears. In the summer, I place my goldfish in an outdoor concrete pool which is partially shaded by a pear tree. Some of the pears drop in, and when they soften sufficiently, the fish nibble at them until they entirely dis-

appear. The pears and the insects which fall into the water are the only foods they get during the summer. When they are taken in in October they are in perfect health.

Oatmeal, Cream of Wheat, vermicelli, soft parts of boiled fish, or any other cereal composed of small grains are good foods exactly as taken from the table. They may also be used uncooked, taking care not to feed heavily. Some of these cereals swell to eight times their dry bulk. We would not want the fish to meet the fate of the boy who ate dried apples and then drank water! Scraped beef (once a week), bread thoroughly dried and crushed, earthworms, meal worms finely chopped, crushed dog biscuit and water crackers are a few of the easily obtained items which would be acceptable on a goldfish bill-of-fare. The white wafer food usually sold in pet and drug stores is only of fair value. Most pet stores sell a granular food composed of a number of ingredients which is better.

The subject of fish food has been gone into very carefully by a number of our semi-amateurs. Several of them now market prepared foods composed largely of the dried form of the insects which as living food is generally recognized as the very best of all foods. Dried fish roe, shredded codfish, pulverized ant eggs, dog biscuit, chopped liver, rice flour, bran meal, and a small quantity of pulverized cuttle-bone are some of the ingredients mixed with the dried insects and entomostraca. The mixture has a certain amount of salt added, and in some cases Epsom salts. The whole is then cooked, dried and granulated into different sizes. Unless one intends using a large quantity, it pays much better to purchase this kind of food than to make it, and if the aquarium keeper wishes to adopt one kind of food, this is perhaps the best as it contains all the necessary elements.

The one best food for practically all aquarium fishes is the living *Daphnia*, a crustacean about the size of a flea, which is found the world over, principally in still ditches. Articles on this delicate morsel have appeared in THE AQUARIUM during the past year, so I shall not write further on that. Another inhabitant of still water is the mosquito "wiggler." This is a wonderfully fine goldfish food. After they are large enough to swallow them, the young goldfish grow more rapidly than on anything else. An occasional meal is greatly appreciated by the large fish, and to see them so rapidly eaten partially compensates for the bites one usually gets while collecting them.

Among living foods should be mentioned the freshwater shrimp. These occur in many brooks and springs. I have never seen them in large quantities, but they are desirable and should be taken whenever opportunity offers. The Germans dry sea-shrimp and use it as the principal part of their foods for all fish. They export large quantities of it to America and other countries where it is reduced to smaller sizes and used largely as goldfish food. It is to be highly recommended for this purpose, and very likely, in a few years, it will be universally used as a part of American composite foods.

In winter it is difficult to get suitable forms of living organic food. For several years I have satisfactorily met this difficulty by feeding chopped oysters, using the soft parts only. After chopping it is well to wash the particles slightly to prevent making the water milky. A slight milkiness is not objectionable. It soon disappears. Oysters may be fed about once a week, that is often enough.

The principal point about feeding is not to feed too much. No more food should be given than will be consumed

in a few minutes. In my own aquarium the last particle of a feeding has disappeared within a minute. I will not attempt to give any rules on the frequency of feeding, but it will gauge by aquarium temperature, which is a more accurate method. When the temperature is between 40 and 50 degrees Fahrenheit, once a week; from 50 to 60, twice weekly; from 60 to 65, every other day; from 65 up, every day. In warm weather I feed a very small quantity twice daily, but I hesitate to mention it for fear some kind-hearted sinner will overdo the matter.

Successful aquarium management consists in reproducing as nearly as possible, natural conditions. Goldfish in nature eat a variety of food. Remember, this is still true in the aquarium.

The Docile Goldfish.

H. G. Parsons, in the course of an able defense of the goldfish as a household pet, says: "The pet goldfish does not sit on the front porch and howl to beat four-of-a-kind. He does not jump on the kitchen table and cop out a pork chop. He does not pull down the lace curtains or sleep on your best hat. There are several other things wherein the goldfish could prove an alibi."

Kansas City Star.

The rearing of carp is a very ancient practice, a treatise on the subject by a Chinese dating from the Third Century.

On February 26th, at the meeting of the Philadelphia Aquarium Society, Mr. W. T. Innes, Jr., will give a talk on "Some Newer Developments in Aquarium Heating."

The catfish family is very large and widely distributed, numbering about seven hundred species, occurring in freshwater, in all parts of the world, but is most abundant in warm climates.

SOCIETY BULLETINS

Brooklyn Aquarium Society ❁ ❁ ❁

Regular meeting 4th Tues.
in every month except June,
July & Aug. at Fairchild Bldg
702 Fulton St., at 8 P. M.
Initiation Fee, \$1.00
Annual Dues, \$2.00

Chicago Fish Fanciers' Club

Regular meetings on the
Second Wednesday at 809-12
City Hall Square Building,
127-139 North Clark St., at
8:30 P. M. on Fourth Wed-
nesday where announced.

Initiation Fee, \$1.00
Annual Dues \$1.00

New York Aquarium Society ❁ ❁ ❁

Regular meetings on the
Second Thursday at the
German-American School,
Sherman Ave., Jersey City,
and on the Fourth Friday
at the American Museum of
Natural History, 77th St.,
and Central Park West, New
York, each month except
July and August.

Initiation Fee, \$1 Dues \$2

Philadelphia Aquarium Society ❁ ❁ ❁

Regular meeting on the
Fourth Wednesday, at 144
Arch Street

Initiation Fee, \$1.00 Annual
Dues, \$1.50. Corresponding
Membership \$1.00 Annually

Milwaukee Aquarium Society ❁ ❁ ❁

Regular meeting on First
Monday at 105 Grand Ave.
Initiation Fee, \$1. Dues, \$1.20

Minneapolis Aquarium Society ❁ ❁ ❁

Boston Aquarium Society ❁ ❁ ❁

Initiation Fee, \$1 Annual Dues, \$1

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Financial Secretary, THEODORE P. FRITZ, 805 Halsey St.
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Tuesday, Feb. 25th:—Annual Election.

President, F. S. YOUNG, 428 West 66th Street
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Treasurer CARL FOSSETTA, 1341 George Street.
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Local Editor F. G. ORSINGER, 123 S. Oakley Blvd.
Local Business Manager J. W. GAGE, 1225 Glendale Ave.

Wednesday, Feb. 26th, "Auction" at residence of Fred S. Orsinger, 123 S. Oakley Blvd.

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Vice President O. H. SMITH, 23 Jacob Street, New York City
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Local Editor JOHN TREADWELL NICHOLS, Am. Museum of Nat. History
Local Business Manager CARL P. ORDING, 1931 Broadway, New York

Thursday, Feb. 13th. — Review of "The Blatter" by H. A. Richt-
berg. Auction of fishes, plants and devices
donated by members.

Friday, Feb. 28th. — Review of the "Wochenschrift" by Richard
Dorn. Address "How to Classify a Fish"
John Treadwell Nichols

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Wednesday, Feb. 26th. — Competition for Comets, Nymphs, Single-tail Telescopes and Fan-tails, all ages.

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Secretary REV. PAUL ROTH, 2602 Prairie Avenue
Librarian AUGUST W. POLLWORTH, 1816 Wright Street
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Monday, Feb. 3rd. — Rev. G. Keller Rubrecht on "Aquarium Plants"

President F. L. TAPPAN, 92 South 7th Street
Treasurer J. W. FRANZEN, Curator Museum Pub. Library
Secretary ROBERT RASMUSSEN, 504 Loan & Trust Bldg

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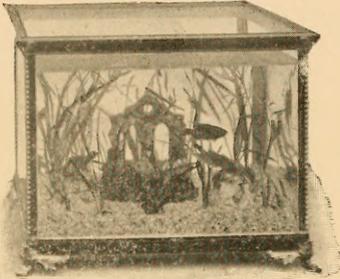
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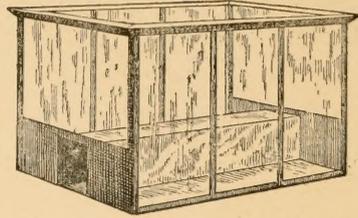
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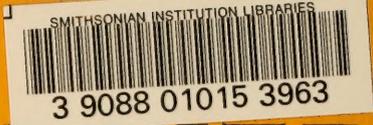
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