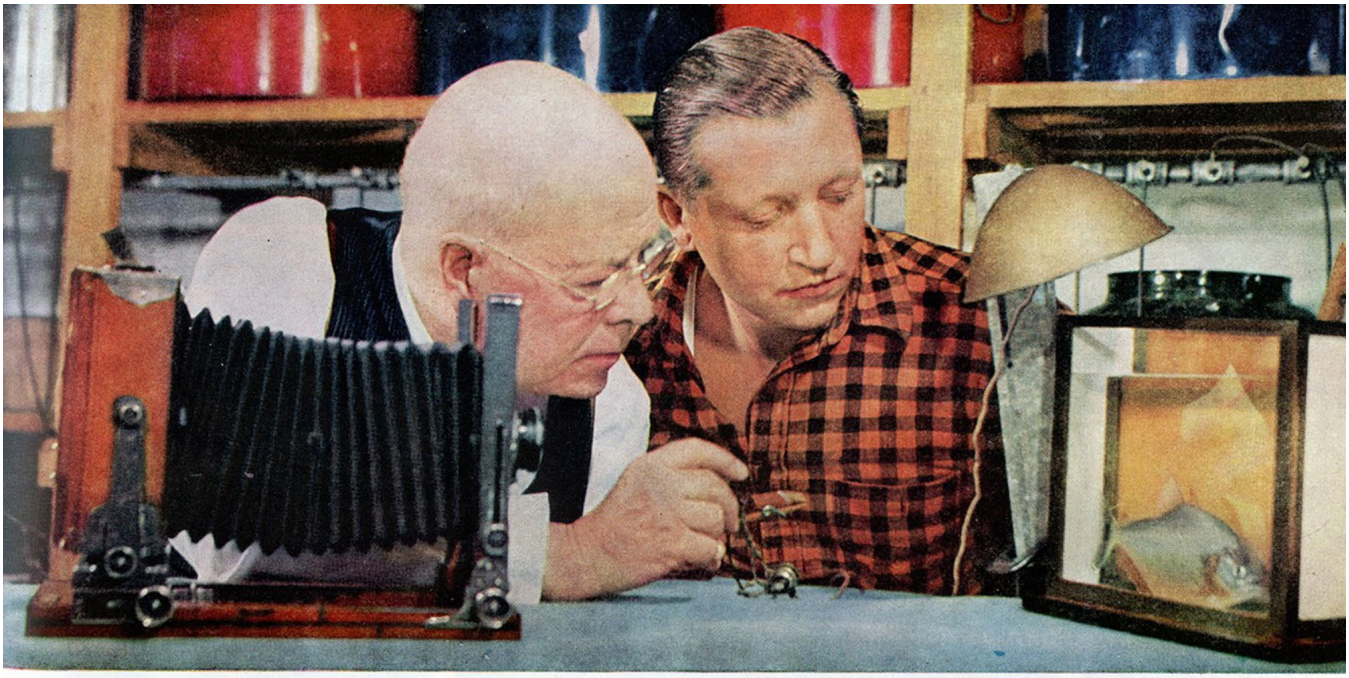

# The William T. Innes Photo Tank

William T. Innes is a legend in the aquarium hobby. Innes was a publisher of one of the longest-running aquarium magazines, called “The Aquarium”, plus a printer, publisher, photographer, and aquarist.

MOAPH is honored to be the keeper of the Innes PHOTO TANK, which came to us from the Wayne Leibel estate. Innes originally gave this rare aquarium relic to his co-worker Alan Mark Fletcher, and it is Alan who eventually sent it to famous cichlid hobby legend Wayne Leibel. We have reprinted the letter from Alan Mark Fletcher to Wayne on this photo tank, plus we have included another article by Innes on how he photographed fish with this small tank.

Last, we have included many pictures taken by Innes with his small photo tank. Please enjoy this interesting bit of aquarium history, and let us know if you have any questions or comments.



Assisted by Cochu, William T. Innes, tropical-fish authority and publisher of Aquarium Magazine, photographs a piranha, the "man-eater of the Amazon." Though small, these fish can strip a 400-pound hog to the bone in ten minutes.

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January 28, 2003

Dr. Wayne Leibel
Department of Biology
Lafayette College
Easton, Pennsylvania 18042

Dear Wayne:

The purpose of this letter is to affirm the authenticity of the Innes photographic tank that you obtained from me.

In September 1952 I was employed by Dr. William T. Innes, the co-owner of Innes Publishing Company, Philadelphia, as Associate Editor of "The Aquarium" magazine. I remained with Innes until June 1960. During those years I was given progressively more responsibility and authority until, by the time I left Innes Publishing Company, I was Editor of all Innes publications and was co-owner of the company.

The small photographic aquarium now in your possession was given to me by Innes himself. Most of the fish pictures in the various editions of the classic book, "Exotic Aquarium Fishes", were made using this aquarium. I used the aquarium for my own fish photography for many years. For example, the photographs of Evorthodus breviceps on page 489 of "Exotic", 19th edition, were taken by me, using this aquarium. To strengthen the verification that this is indeed William T. Innes's photo tank, I am enclosing my file copy of the female's photograph, taken with the Innes tank.

Innes's photo tank was custom made for him by one of the local Philadelphia tropical fish firms, probably either Barrett or Bausman. The frame is angle iron, and the glass is 1/8-inch ground, polished plate glass. For the bottom, milk glass was used, to increase reflectivity of light.

Knowing your commitment to the integrity of the history of the aquarium hobby, Wayne, I am pleased that this significant relic of the hobby is now your property. Please see that it is preserved for future generations of aquarists.

Sincerely,

Alan M. Fletcher

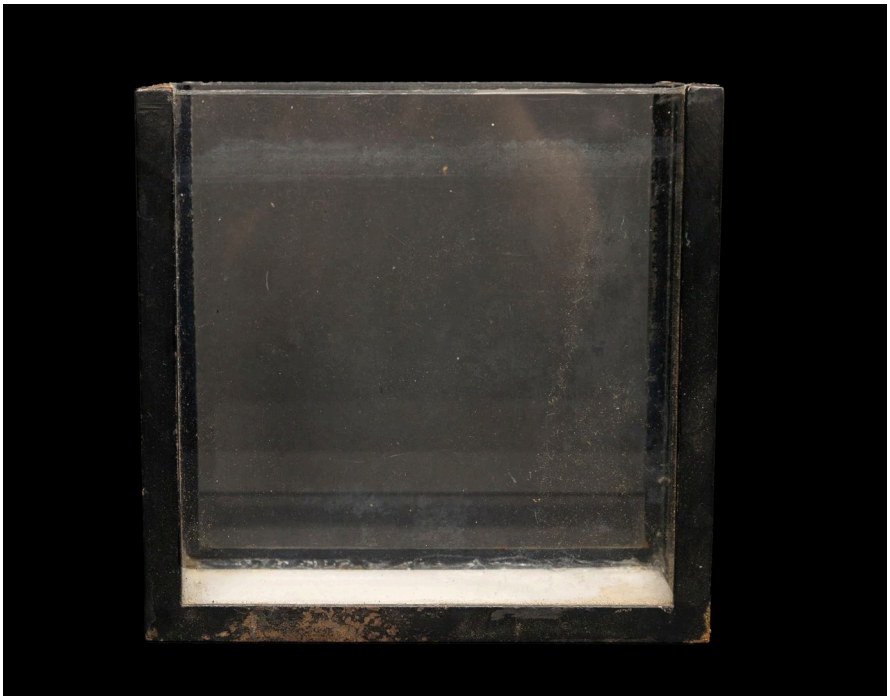

Photo by Alan M. Fletcher of *Evorthodus breviceps.*

2000 LECTURES ON PHOTOGRAPHY - PUBLISHED SERIALLY - THRICE EACH MONTH

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ISSUE 4

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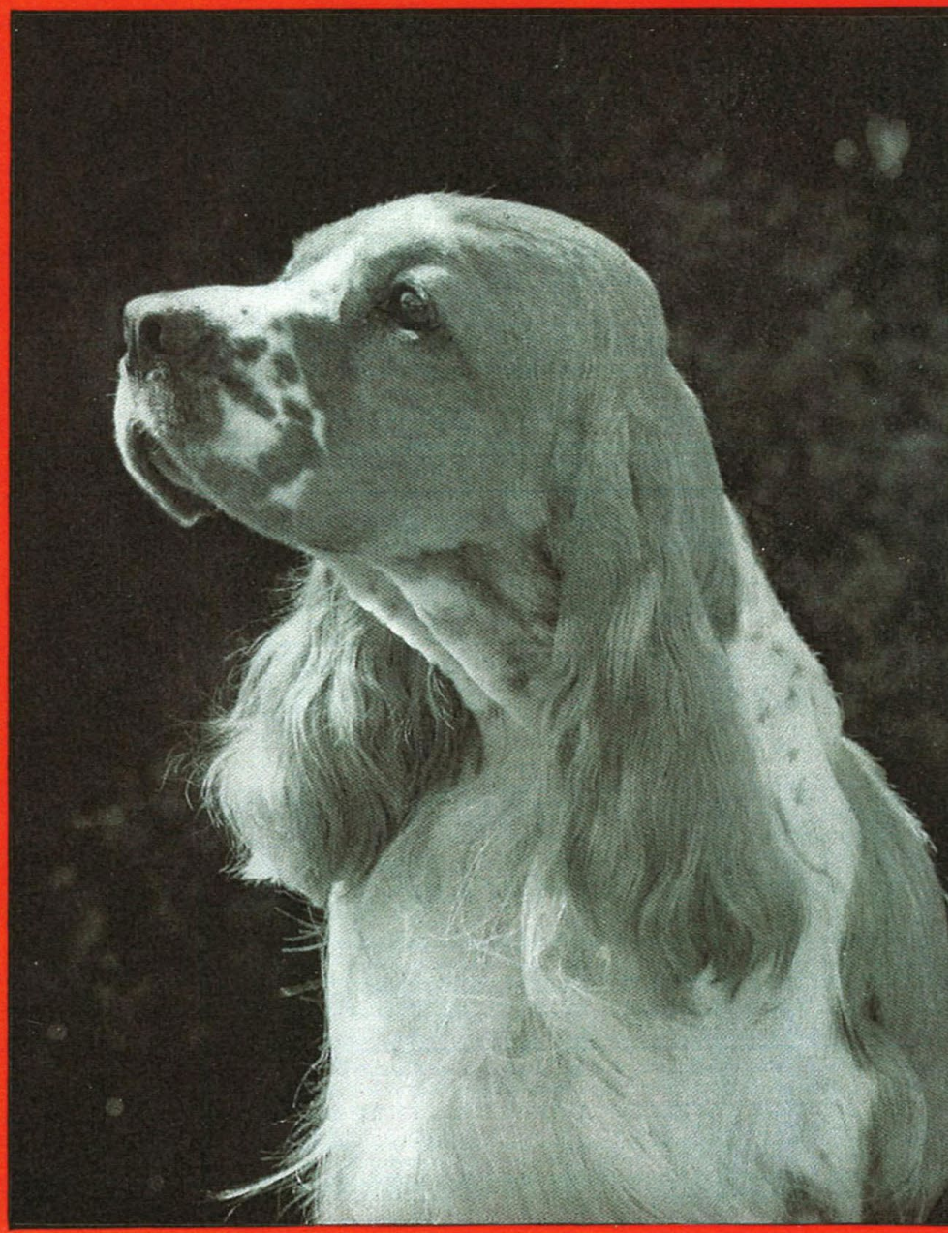

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A COMPLETE GUIDE TO AMATEUR AND PROFESSIONAL PHOTOGRAPHY

# AQUARIUM AND FISH PHOTOGRAPHY

**William T. Innes**

*Editor*, The Aquarium Magazine

**Photographing fish in a museum or a home aquarium is a fascinating game. In this article an expert of long experience tells of aquarium equipment, camera equipment, lighting, backgrounds, and exposures. Color photography of fish and markets for fish pictures are also discussed.**

*Photos by William T. Innes unless otherwise credited.*

THERE was a time when ichthyologists had a poor opinion of photography as a method of picturing fishes. This was in large part due to the fact that speed technic was as nothing compared with today's achievements. Fish, to look natural, must have at least a little freedom, and freedom means motion. To photographically stop motion in water is at least twice as difficult as in air. Water absorbs so much light that it cuts exposure time fifty percent.

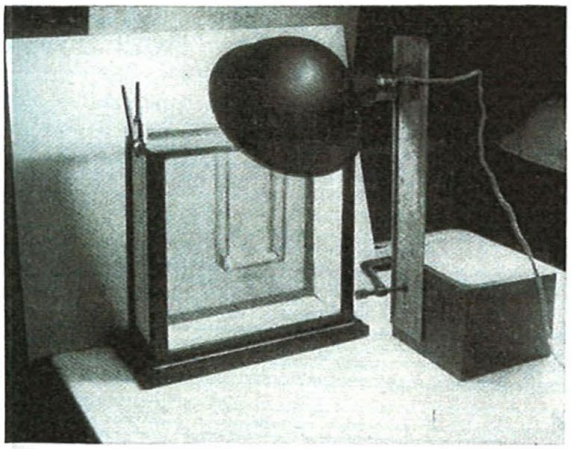
Besides this, our scientist friends need diagrammatic records of certain features that are generally impossible to record by photography. Any process has its limitations, but modern photography, especially since the advent of color work, has made such valuable contributions to fish records that it is now widely used, especially in magazines devoted to aquarium fishes, where it has virtually replaced wash drawings, paintings, and pen pictures. It gives a certain fidelity and realism that escapes the hand of the artist.

The first really good fish photographs were made in 1900 to 1910 by Dr. R. W. Shufeldt, who was connected with the Bureau of Fisheries in Washington, D. C. His subjects were principally good fishes posed in big tanks with strong overhead natural light. As the large size of these fishes compelled him to use a short camera bellows in order to bring the subjects down to plate size, and

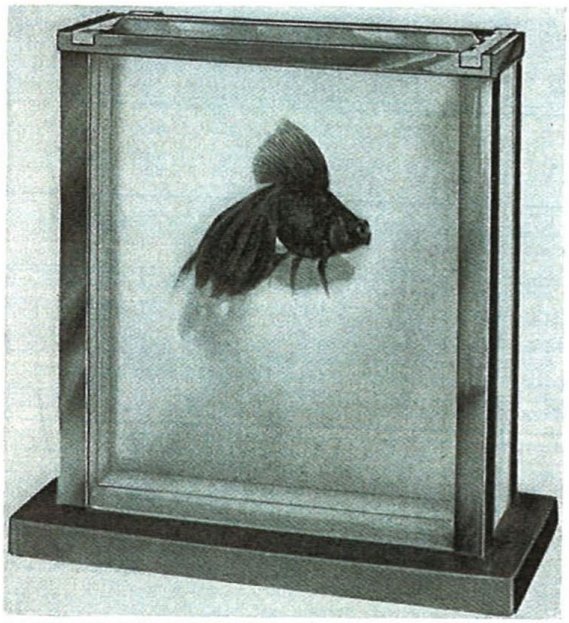
as the consequent distance from the fishes was considerable, he was able to secure the maximum of speed and sufficient depth of field while using his lens wide open. Even with the comparatively slow plates of that day he produced sharp, well-timed negatives. But fish photography, as we understand it today, is different and more exacting.

## *AQUARIUM EQUIPMENT*

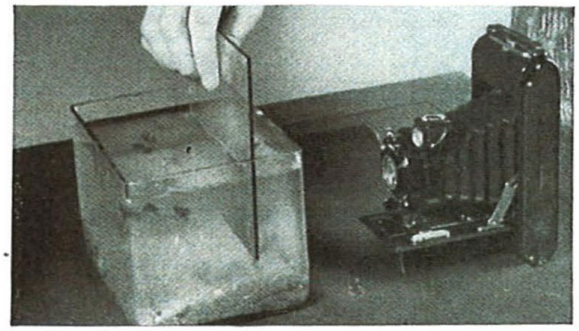
For satisfactory results, some simple special equipment is necessary, principally for keeping the fish confined in a small focal area without cramping it and causing it to "fold up." The main requirement is a small, narrow aquarium, just big enough to accommodate the largest fish likely to be used. Mine is $7\frac{1}{2}$ inches high and wide, and 3 inches through from front to back. Then there are 4 special reducing compartments of sizes to suit different fishes. These are made of sheets of glass that just snugly fit in the full size of the tank and on these are placed graded sizes of pens, one pen to each sheet. They are made by gluing 3 narrow strips of glass on the larger sheet, forming a rectangular pen with the opening at the upper edge. When this is placed in the aquarium and against the front glass, it forms a cell open at the top so the fish can be dropped in. The edges of the glass strips can easily be made square by rubbing them on a wet, flat carborundum stone. They can be glued down by wetting the edges with spar varnish and drying for a week. Personally I use clear Duco, which hardens in about 2 days and makes a permanent job.



**PHOTOGRAPHING TANK FOR AVERAGE AQUARIUM FISHES.** Front opening space between frame sides is $7\frac{1}{2} \times 7\frac{1}{2}$ inches. Thickness, 3 inches. Bottom and narrow sides, white opal glass. Front and back $\frac{1}{8}$ inch plate glass. This absorbs the minimum of light and is, to all practical purposes, optically plane. Small compartment in center is one of three assorted sizes, each selected according to size of fish to be confined within the focal area. Compartments or cells are made by cementing strips of glass on edge on a sheet of glass that fits snugly inside the aquarium. The edge of this sheet may be seen in the illustration against the white side. This sheet with its attached cell is placed against the front glass of the little tank and held in position by a clip at both ends. The light can be held in position in a variety of ways. A table lamp with flexible shaft is fairly good, but the illustrated idea is better. It is capable of greater variety and quicker changes. The base is a heavy chunk of 4-inch angle iron. A 10-cent metal clamp attaches the galvanized iron shaft to it. This shaft has turned-over edges, into which neatly fits a brass plate which is the base of the lamp. The lamp slides in the slot easily, but stays where put. The angle of the shaft can also be adjusted where it is clamped to the iron base.
As the photographing is done on an enamel kitchen table, the different units can be easily shifted. For most pictures the light is directly over the cell. The picture shows a tilted gray cardboard background.
There are 2 other objects in using the cells inside the aquarium. First, they keep the composition away from the disagreeable details of the aquarium base. Second, they elevate the fish to about lens level



**AN EARLIER PHOTOGRAPHING AQUARIUM.** This one has no cell, only a back sheet of glass to keep the fish in the focal plane. Some fishes require more freedom than others in order to strike a good posture. Fancy goldfish, such as this, is one of them. The photographer has to take longer chances and more patience to secure a good shot near the center of the plate. The glass portion in this instance is not held by clips, but is placed in niches selected according to the needs of the particular fish being photographed. Such a portion should be used in an ordinary aquarium if the photographer has no special one. The fishes can at least be brought into focus



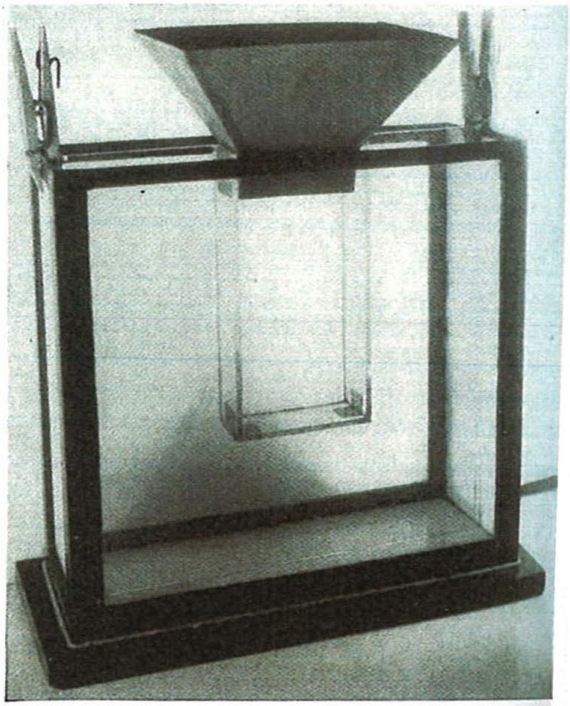
**Dividing a small tank with a piece of glass to restrict the movement of fish to be photographed**

In regard to placing the fish in the rather narrow slot formed by the removable cell and the front glass of the aquarium, this is at best a somewhat ticklish job, for the subject is liable to leap out of the net at exactly the wrong moment. A dive to the dry floor is almost certain to injure the fish, an accident likely to prove expensive and exasperating, as well as embarrassing if the fish belongs to somebody else. To reduce this chance to a minimum, an oblong funnel of metal or cardboard can be used to advantage. The funnel is simply placed in the glass slot and the fish dumped in. If previous focusing and lighting have been worked out in advance (possibly by use of a "stand-in" fish) and the funnel is quickly gotten out of the way of any overhead light, it often happens that the best picture is to be had while the fish is newly surprised at its changed surroundings.

Most of my 4 funnels (one to each size opening) are made of cardboard fastened together with adhesive craft paper. The whole job is then varnished, both for durability and to prevent the fish from touching any absorbent surface. (Every kind of fish culturist wets his hands before touching a fish.) My one metal funnel, of zinc, has an advantage over the one of cardboard. The water, after being used for several fishes, may become too dirty from droppings. To replace this by clear new water would be the obvious thing for the non-aquarist to do, but very bad for the fish. Old water is valuable and the supply is limited. We usually take it from a clear aquarium. If the photographer used fresh water, he would never be invited back. When the floating black specks become too obvious, I put absorbent cotton in the metal funnel and filter it. The cardboard would not stand this long exposure to water. The transfer of the fish from one container to another should not involve a change in temperature of more than about 2° Fahrenheit.

One of the principal secrets of fish photography is the skillful use of a glass "pusher" for working the subject up to the plane of focus, just inside the front glass. The glass just fits the inside of the cell, and must be manipulated by hand. Most fishes tend to go to the bottom when frightened. It is the operator's job to quietly work the fish upward into position so that the extended fins all show. At the same time he should avoid, if possible, having the bottom of the cell show in the picture.

As the cell or its supporting sheet of glass leaves some space between itself and the

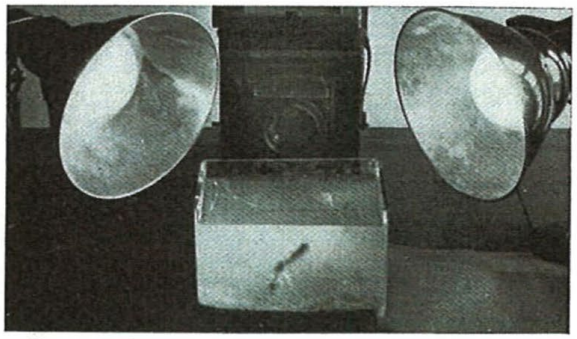


**FISH FUNNEL. This figure illustrates one of the features of fish photography which is a nicety but not a necessity. It is a metal (zinc) funnel made to fit the opening of the fish cell. Its use reduces to practically nothing the possibility of dropping the fish outside the tank, an accident which otherwise takes considerable care to avoid in transferring the fish from a net into the small cell opening. The funnel is also handy to place in position while developing a plate to ascertain whether another exposure is needed. Fishes sometimes leap out of the crowded confines of the cell. With the funnel in place they fall back again. If no such device is at hand, the top of the tank should always be covered with a strip of glass or a piece of screen during periods between exposures**

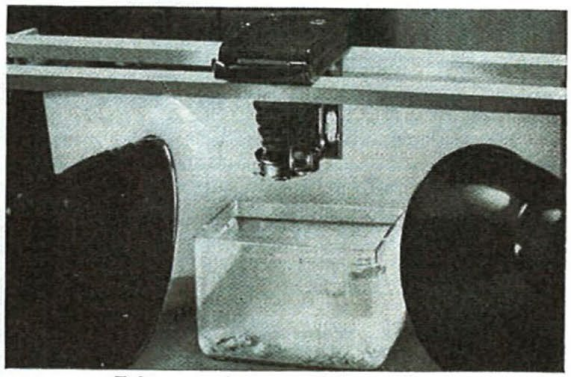
back of the aquarium, a background of plants may be placed there. I never use them except when making color pictures, as there is always danger of valuable outlines of the subject being obliterated by lack of contrast at certain points. It is best to place both the aquarium and the camera on a table. Change of size and focus in this way is made easier with a tripod.

## PHOTOFLOOD LIGHTS

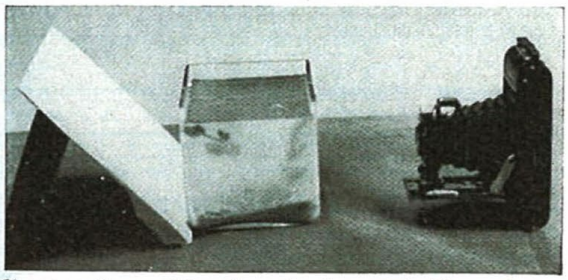
Usually these are unsatisfactory for fish photography, because it is out of the question to crowd enough of them to allow the use of a small stop and a $\frac{1}{40}$ second exposure. Enough lights to give the speed at a small stop would be extremely hot and also hard on the eyes of the fish at close range.



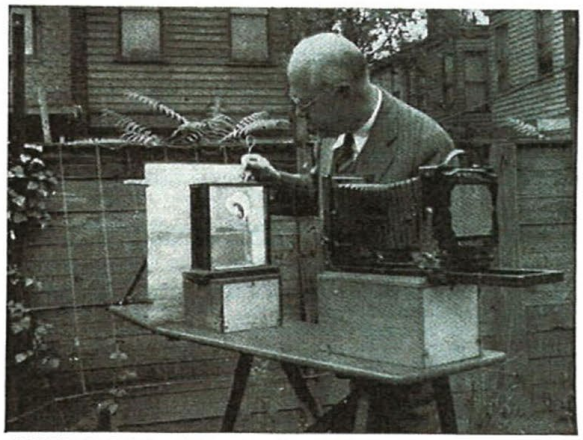
Showing the arrangement of lamps on a small tank



Taking a photograph from above



Showing the position for a background. The color or shade of the card can be varied to suit the subject



OUTDOORS. The stand used here is a light but firm folding ironing board. Wooden bases for camera and tank are collapsible, held together by hinges and hooks. Background is a cardboard of clouded design, used to give a more watery effect than a flat tone. Although this portrait was intentionally taken while the sun was under a cloud, direct sun is best when photographing fishes outdoors. A 45° angle of sun is ideal, but from May 1 to September 1 good exposures can be had from 9 till 11 A.M. and from 2 to 4 P.M. The photographer is here using a net to remove a seahorse from the aquarium

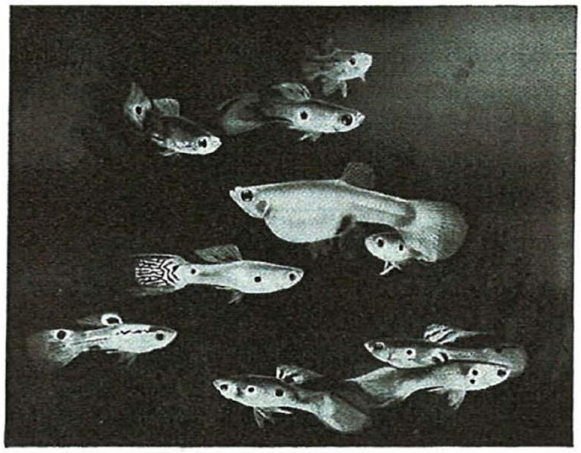
Kodachrome movie film has a Weston reading of about 8. Extremely fine detail is not needed in motion pictures, so here it is impossible to use a good lens wide open and get an acceptable result with the use of plenty of close-up photoflood illumination.

## FLASH WORK

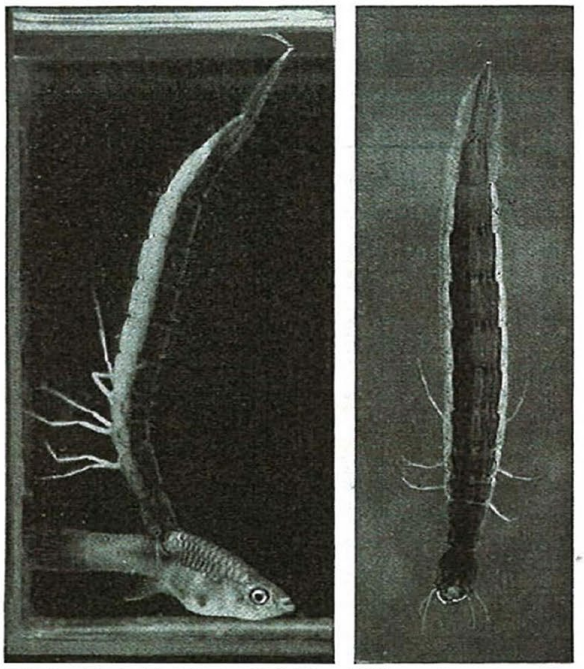
The innovation of flashbulbs has been a great help to the fish photographer. I use the small 11A G.E. bulb, placing it in a reflector only 1 inch or 2 above the water, the reflector turned so as to keep direct light out of the lens. The flash is synchronized with the shutter. Regular commercial synchronizers do this very well. If test development is done at once, it is well to move the cell back a little from the front glass so that the fish will have some change of water while waiting for the next exposure.

I use white porcelain glass for the bottom and the narrow sides of the photographing aquarium. With this aid it is surprising what even illumination can be had from the single flashbulb. Some side light on the fish is also reflected from the inside surfaces of the cell. There are occasions in which it is desirable to use some direct front light in order to bring out some detail on the side of the fish. Lights in reflectors (1 on either side of the

front) build this up to any desired point. They should be placed at an angle of about 45° to the glass so as not to reflect themselves in the picture. They are of course placed in the same electric circuit as the top bulb.



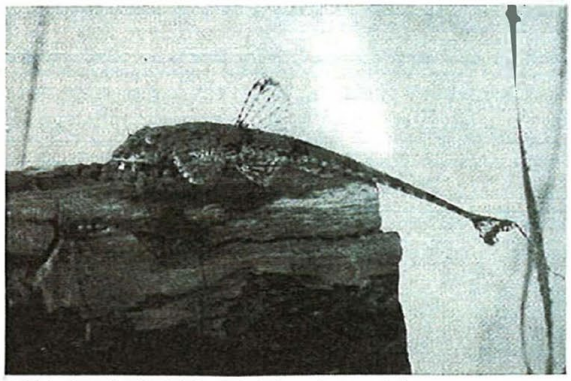
ACTION PICTURE OF GUPPIES, in which 9 males are paying court to a female. This had to be taken in a set-up aquarium large enough to give them freedom, yet small enough so that the photographer could wait for them to do their act in the previously focused spot. It was a 3-gallon tank. Each male was selected as showing a recognized color pattern



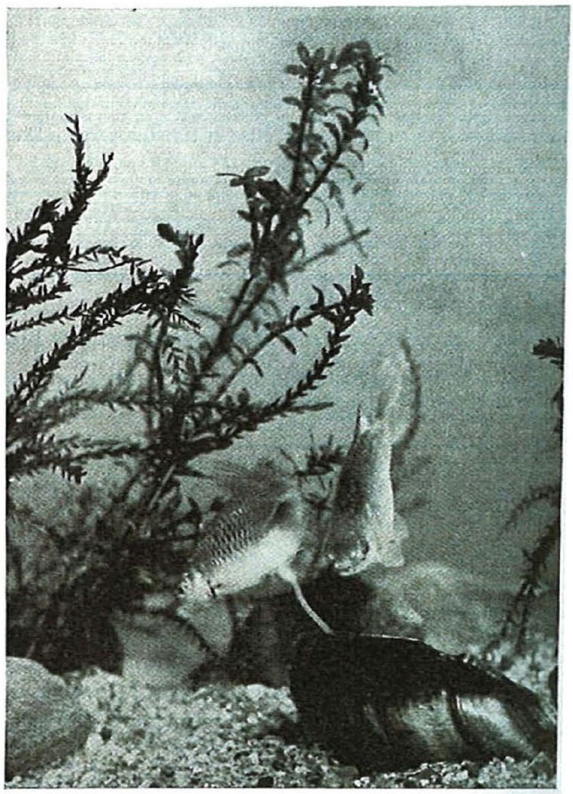
FISH ENEMY IN ACTION. "Water Tiger" is the popular name for this voracious enemy of fishes. In the picture to the left it has held the fish for only a few seconds, but has sucked most of its blood in that short time. With "action" in demand everywhere, the unpleasant is not to be excluded. In order to take this picture a hungry "Tiger" was placed in a small cell with the fish, which it immediately seized and obligingly posed in a good position

*DAYLIGHT*

Another light source for fish photography is daylight. The sun furnishes a very fine light when at a 45° angle. The important



FISH GUARDING EGGS. Most fish eggs are quite small, but these are about one quarter the size of a pea. Such natural history subjects as these sometimes require a lot of waiting on the part of the photographer, but there is always a good market



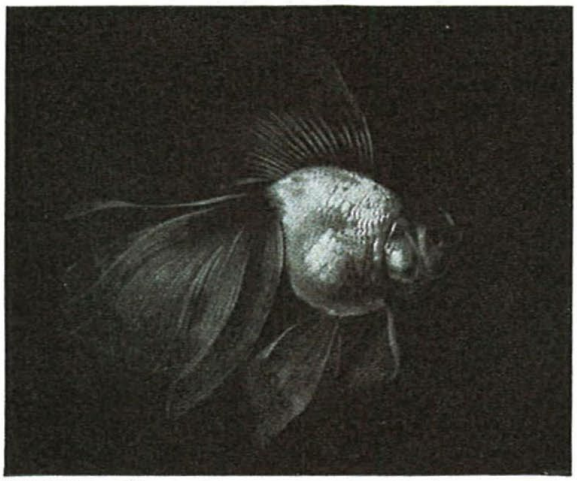
ACTION. The Bitterling fish has one of the most extraordinary methods of protecting its eggs and young. The female, which develops a long tube at breeding time, inserts this tube in the opening of a freshwater mussel, where she deposits her eggs. Here the young live on the juices of the mussel, as well as on microscopic life in the water, and when they are ready, they emerge into the outer world. Shots such as these are rare, and they bring good prices

thing is not to try to do this work too early or too late in the day, as the long shadows create difficulties. Be careful of reflections.

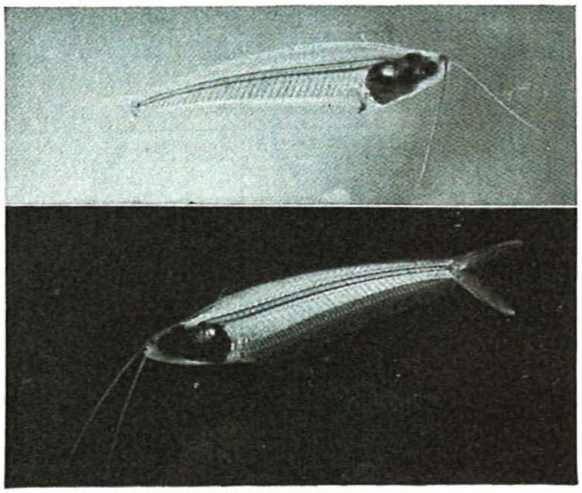
## *BACKGROUNDS AND COMPOSITION*

Cardboard backgrounds of white, black, and gray suffice for all black and white subjects, according to their coloration. Securing contrast between translucent fins and the background is the hardest problem.

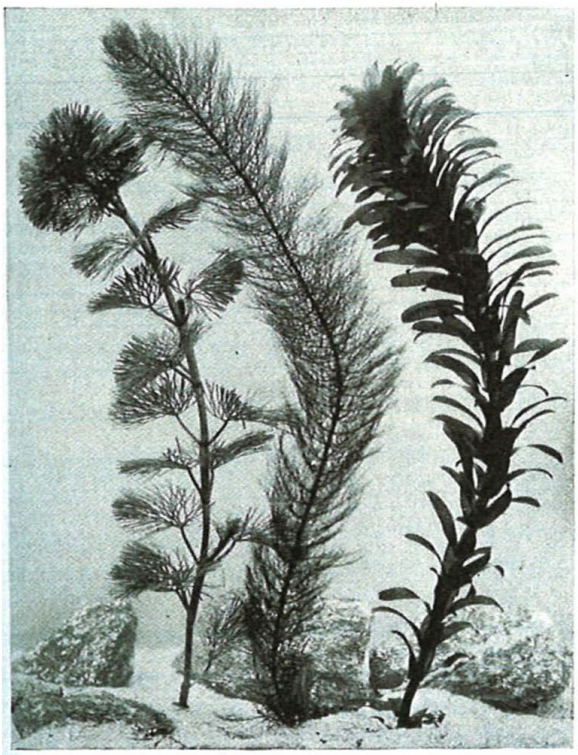
The surest way of doing this is by using a dark background and "photographing towards the light." The source of illumination is placed between the photographing tank



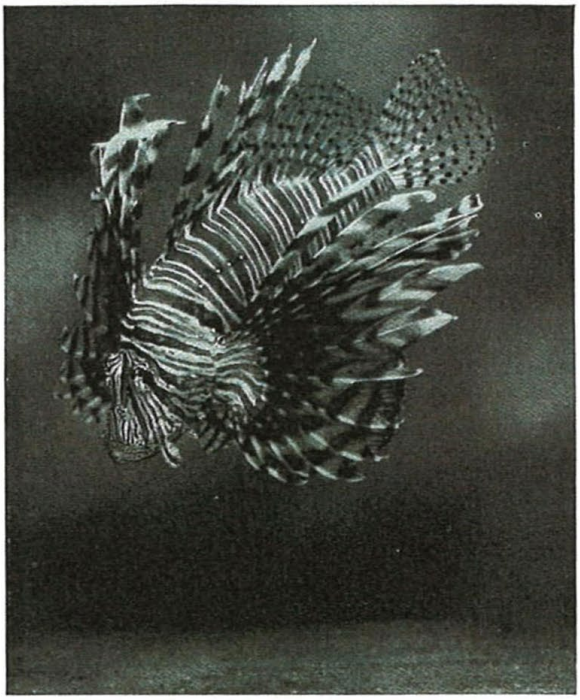
**SUNSET.** This goldfish is considered to be one of the finest ever bred. It was photographed against a dark background, with 45 degree direct sunlight for illumination



**BENEFIT OF BACKGROUND.** A nearly transparent fish photographed both ways so as to be sure of getting the full benefits of both styles of background



**AQUATIC PLANT PHOTOGRAPHY.** It has been found that a tank at least 16 inches in height is needed to properly pose individual plants. The tank should have clear glass on all sides, as trick lighting is often necessary to bring out characteristics



**LIONFISH.** This extraordinary fish, which seems to be fully equipped with bird feathers, is a marine subject, and was photographed in one of the large tanks at a public aquarium. As the fish is very tame it was possible to coax it to the front of the aquarium without the use of a 'pusher glass.' The lights were placed both overhead and in front of the aquarium glass. Photoflash bulbs were used

*Photo, Shedd Aquarium, Chicago*

SEAHORSES IN DOMESTIC SCENE. Family duties are reversed in the lives of these little marine animals. The male has a pouch which might be compared to that of the kangaroo. The female deposits the eggs in this pouch and thenceforth the father becomes father and mother. We see here the father (at the right) quite willingly accepting the eggs from the female

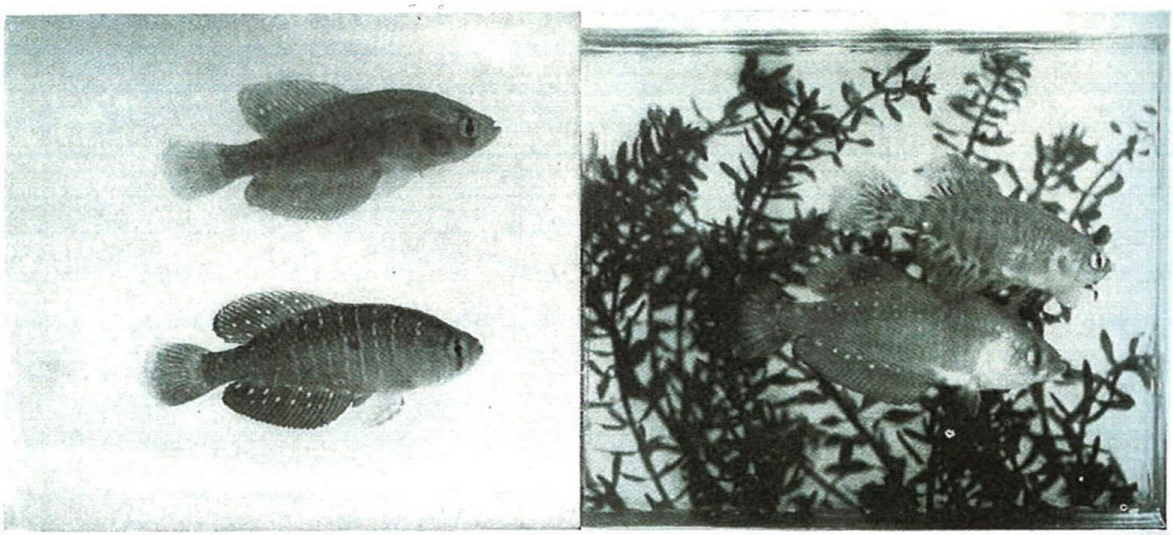
and the background, just below the line of vision.

In order to utilize the same flash for toplighting the subject and illuminating the background card, I tip the card back so the light strikes it more fully. A white card stood vertically against the back of the aquarium will photograph medium gray with the light.

It is difficult to apply rules of composition to this work. Composition is a problem in color work, where separation must be made between the colors of various fishes and that of the background.

Some of the most interesting pictures are of groups, but this involves the use of added light since most light is needed to stop the action of a group of moving fish.

The most difficult fish pictures to make are those of pairs, but these are also the most interesting.



BACKGROUND INTERFERENCE. These two pictures show how a pictorial background may be a disadvantage if we are trying to record all possible details of the fish, especially the outlines of the films. They also show another factor with which the fish photographer has to contend. That is the change in color due to the fright of the fish, or from too long confinement in a small cell. The fishes in these two pictures are the same species, and the lower fish is the same individual in both pictures. The inference is that the whole job should be prepared and set up in such a way that the elapsed time of confining the fish should be as short as possible

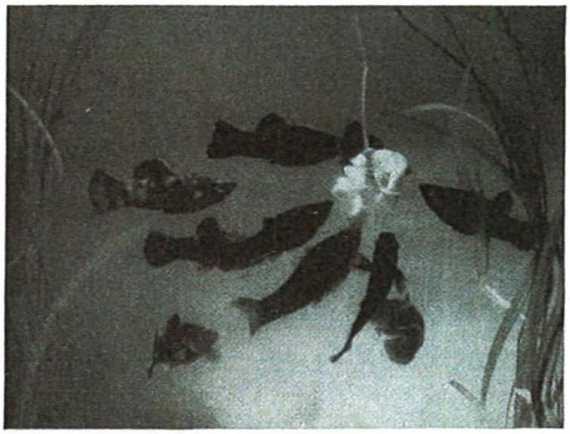
PTEROPHYLLUM SCALARE or Freshwater Angel Fish. This fish is generally considered to be 'The King of Aquarium Fishes.' In addition to its beautiful fins and grand style, its body is as bright as a new silver dollar. In order to secure this brightness the subject has been illuminated entirely from the front of the aquarium without any top light. This is obvious in the heavy shadow on the upper part of the head. In order to avoid reflections from the source of light (photoflash) the lights were placed on either side of the aquarium at about a 45° angle to the glass

## CAMERA AND EQUIPMENT

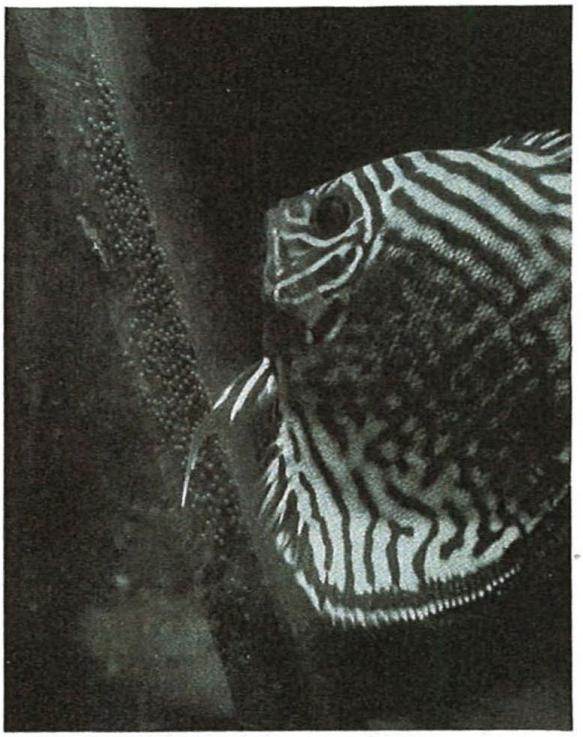
I have found a 4 x 5 view camera to be the most satisfactory for this work. To photograph subjects at full size—which is necessary in fish photography—requires a camera with a rather long bellows, as the distance between the lens and the subject must be the same as from the lens to the film or plate. I think that a camera permitting back focusing is best, since it permits more perfect alignment between camera and aquarium.

A long focal length lens is necessary in order to picture the fish in life size. I regularly use a 7-inch lens on my 4 x 5 view camera.

High speed film is most useful in this work. Eastman Super-XX and Agfa Superpan Press permit small lens openings at the fast shutter speeds which the aquarium makes necessary.



**TRICKING THE FISH INTO POSING.** By dangling a piece of shrimp on a string it is possible to gather a lively group of fishes into a pre-arranged focal area. Such a shot as this can easily be taken in an ordinary aquarium



**POMPADOUR FISH.** Fanning its eggs (which are deposited on a bar of slate), this makes an easy subject to photograph in an ordinary aquarium, provided the owner has the foresight to place the bar in a suitable spot before the eggs are deposited. If eggs are touched or moved, the fish will either abandon or eat them

## EXPOSURES AND FOCUSING

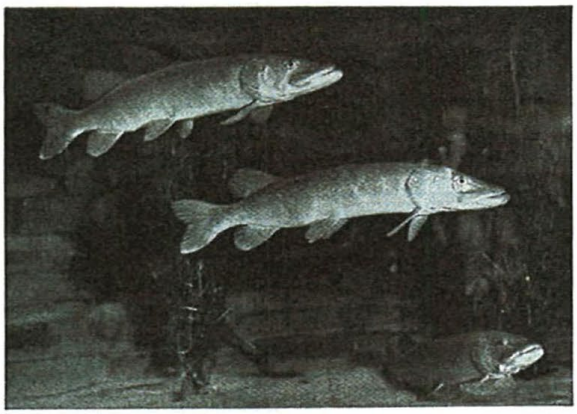
A shutter speed of $\frac{1}{50}$ second is needed to stop the action of a slow-moving fish when it is being photographed life size. Using the aquarium set-up already described, with the flash equipment, you may expect to get good depth of field and a full exposure with a stop of about f/32, when a film rating Weston 50 is used. This lens aperture is best, though f/22 will also give enough depth of field and sharpness.

I use an ordinary bulb for preliminary focusing and studying the picture.

## COLOR PHOTOGRAPHY

While single-shot color separation cameras offer advantages to commercial photographers, Kodachrome is simpler and is cap-

**FAMILY OF FRESHWATER ANGEL FISHES.** Although the glass is not obvious, there is a sheet within three inches of the front glass, bringing nearly all the fishes into focus. A few babies were purposely allowed in back of the divider so they would be out of focus and thereby give the picture a little more realism. As this aquarium was 18 inches deep and it was necessary to use an f/22 stop; in order to secure good general focus, it was necessary to use 4 photoflashes, two overhead and two outside front



**FRESHWATER PIKE. This photograph was made in the aquarium by using 1 flashbulb for illumination. DATA: fast pan film, $\frac{1}{50}$ second, f/4.5**
***Photo, F. W. Bond, F.R.P.S.***

able of extreme sharpness, a point always to be remembered in fish photography where identification of species is a consideration.

The main point to be considered is timing, so important in all fish photography. Using the type of film made for use in conjunction with regular flashbulbs (not the "daylight" type of film nor bulb) we have a Weston speed of 6, or approximately 8 times slower than a Weston 50 black and white plate. This is compensated for by using a No. 21 flashbulb and a diaphragm of f/22, which still gives reasonably good depth of field. After a little experimenting a standard exposure can be worked out so that uniformly good results can be had every time.

Superb results in color photographs of fishes are shown by Walter H. Chute in the March, 1941 issue of *National Geographic Magazine*. The author also shows a picture of his simple set-up for doing the work.

## *MARKETS*

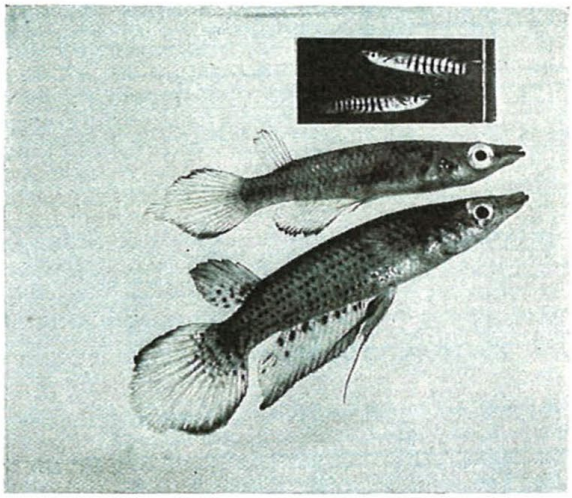
Many magazines are on the lookout for good pictures of natural history subjects. Fine pictures of fishes are among the most difficult for them to secure. Action pictures are doubly valuable. Publishers often write me for fish illustrations. This large field is open for a reasonable number of fish photographers. There is also a place in photographic salons for these pictures.

## *LARGE AQUARIUMS*

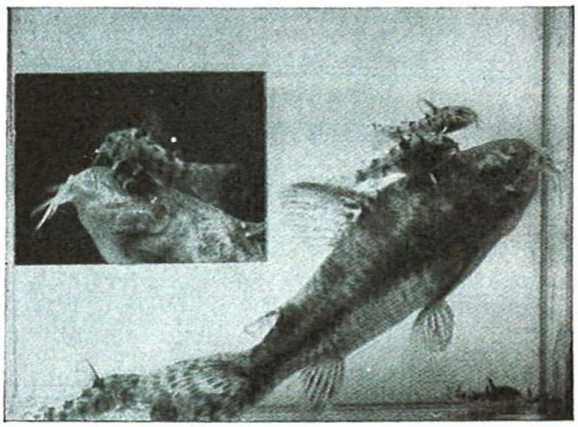
Photographing in a regular aquarium is rather tough. Results are apt to be disappointing, but it is the only way to get pictures of the interesting family habits of fishes. One has to hope the action will take place where the camera is pointed. Following around with a hand camera is pretty difficult. Overhead light is best. In a 10 gallon tank with water depth of 14 inches there will be needed at least two large No. 21 flashbulbs, for a small stop must be used and the deep water absorbs a great deal of light.

The foliage in a planted aquarium usually photographs about 25% as well as it looks to the eye.

**FAMILY LIFE. This pair of Freshwater Angel Fish was guarding their young, which they have just taken from one leaf and sprayed on another. A subject like this is easy to focus on, but the close proximity of the photographer is liable to frighten some species and cause them to swallow their young**



**INSETS. Pasted-on insets of babies of the same species are interesting to aquarists. Usually the young are different in appearance from the parents, and in a tank of mixed young it is a help to be able to identify the individuals**



**HUMAN INTEREST IN FISH PICTURES.** This South American Catfish never seems annoyed by her family of babies

**ARC LAMP.** A lamp in which a powerful light is obtained by passing an electric current through a pair of slightly separated carbon rods. An intensely brilliant electric arc is formed when the current is interrupted by the gap in the two rods.

There are two types of arc lamps: open lamps, in which the carbons are exposed to the air, and enclosed lamps. The latter have the carbon rods almost hermetically sealed in a glass-covered case. They burn in a mixture of carbon monoxide and nitrogen formed by their own combustion.

The light from arc lamps has an extremely high actinic value. It is extremely contrasty, producing heavy, clear-cut shadows.

Arc lamps were formerly used in commercial photography, studio portraiture, printing, copying, enlarging, photomicrography, optical lanterns, and cinematography. They have been replaced in practically all these fields by mercury lamps and fluorescent lamps but are still used in photomechanical processes.

## ARCHEOLOGICAL PHOTOGRAPHY

**Rigmor Jacobsen**

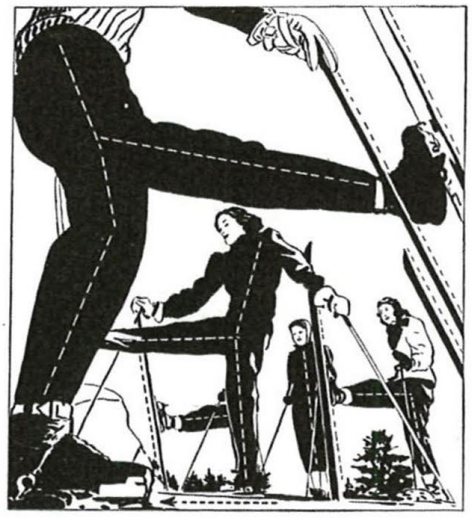
*Photographer, Oriental Institute, Chicago*

**The new applications of photography to archeology are told here by a woman with many years' experience as a photographer in the field. Personal requirements of photographers for these specialized jobs . . . The particular problems of excavation photography . . . Kite photography and its use in archeology . . . Studio work . . . Darkroom work . . . These and other phases of archeological photography are covered in this complete and comprehensive article.**

*See Also Anthropology and the Camera, Archeology and the Miniature, Tropical Photography*

WHEN archeology was young, excavators used to measure the success or failure of a season in terms of impressive objects carried home and displayed in the museum for which they worked. Nowadays the archeologist realizes that his task is of far wider scope, that the purpose of his work is to furnish a complete and exact picture of ancient civilization, and that such a picture can only be obtained by detailed observation and careful recording of context and condition of every single find. Thus not only what he finds, but

(*Continued on page following insert*)



### COMPOSITION ANALYSIS for . . . SKI CLASS

**The choice of an unusual camera angle determines the compositional character of this picture. It is always stimulating to the eye to see a familiar scene from an unfamiliar angle. If it were not for these unusual angle shots, many a photographic magazine might be hard pressed for pictorial excitement. The large dominating figure in the foreground (the teacher) carries the main composition which is 100 percent angular and linear. This motive is repeated in the good looking pupils. To make any kind of composition out of such angular material is far from easy, and the maker of this print has almost succeeded in bringing harmony into this chaos of legs, arms, and skis. The tonal range of the print is as good as can be expected under such harsh lighting conditions. The dark clothing of the skiers, the white snow, the gloves, and white sweaters may have a tendency to disappear into the tones of the sky—adding to the rather broken up effect of the composition. Winter sports pictures are always compromise exposures. The brightness range of the entire scene far exceeds that of the film, and one has to choose between recording snow and sky, or the usual dark clothes worn for winter sports. Notice the skillful placing of the instructor's right foot and ski, which forms a logical base for the composition.**

*Konrad Cramer*