

The Aquarist

and Pondkeeper

FEBRUARY 1967



MONTHLY
Vol. XXXI No. 11

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Aquaria also Tropical Marine
100 Varieties of fish usually in stock on view
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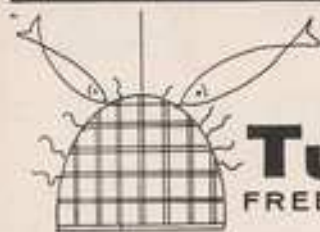
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48 x 10 x 15 ..	£20 10 0
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Sagittaria ..	from 6d. each
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By post, add 2/-	Minimum 10/-

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36 x 12 ..	37/6	36 x 12 x 36 ..	40/-

Aquarium covers sent by post only at customer's risk.

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Postal Charges Add 2/- up to 10/-; 2/6 up to 20/-; 3/- up to £2; 4/- up to £5. (Exception Tanks etc.)
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Simple to use in w.c. cistern or large jar of water. No longer need your Tubifex be a trouble by nuisance or smell. Ask to see one at your local shop.



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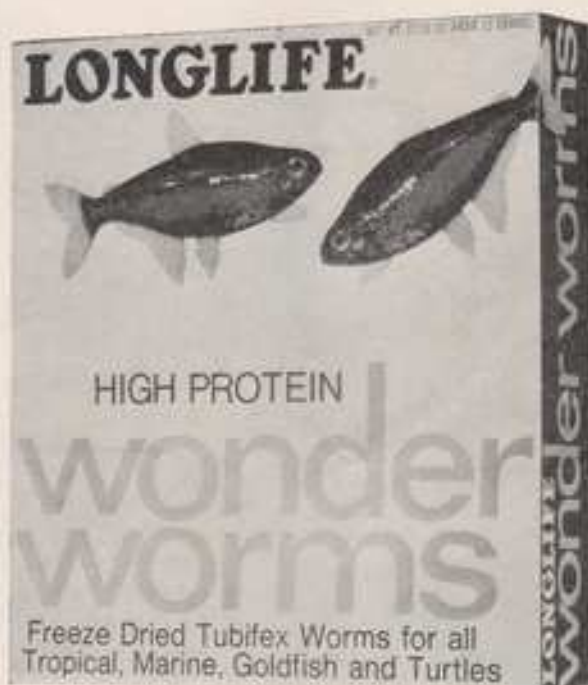
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Delicious news: Longlife's tubifex worms! Freeze-dried live by an exclusive new process that captures the full, fresh flavor Nature put there. And nitrogen-protected, then sealed in special foil-laminated packets that need no refrigeration. Result: guaranteed freshness! Plus the nourishment of 50% protein, too. And such palatability that fish and turtles will literally take Wonder Worms right out of your hand!

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Place approximately $\frac{1}{2}$ " layer of the medium between two layers of glass wool with or without carbon.

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PRICE 5/- PER CARTON

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A may be necessary to substitute certain plants owing to the time of year

TROPICALS	£1	H	£1
A	30 plants including Dwarf Lily Cryptocoryne Wisteria	4 Vallisneria 4 Elodea 4 Hydrocotyle 4 Amazon Chain Sword 4 Portia Clover	
B	12 Vallisneria 12 Myriophyllum 2 Micro Sagittaria 4 Ludwigia 4 Elodea Densa	12 Sagittaria 8 Thyrsophyllum 4 Ludwigia 4 Moneywort 4 Harrowort 1 Portia Riccia 2 Elodea Densa	
C	12 Vallisneria 4 Myriophyllum 4 Ludwigia 4 Elodea Densa 4 Bacopa 1 Amazon Chain Sword 1 Portia Clover	1 Giant Amazon Sword Plant 6-8 inches	7/6
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E	4 Vallisneria 4 Myriophyllum 4 Hydrocotyle 4 Elodea Densa	1 Willow Cyp 2 Cordax 2 Haeritidum 2 Amazon Chain Swords	10/-
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4 Ludwigia 4 Cabomba 4 Ambulia 4 Vallisneria	2 Giant Hydrocotyle 2 Giant Sagittaria 1 Wisteria 1 Nymphaea Stellata		

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36in. x 12in. x 15in. low-tinted aquaria with wrought iron bakelite stand £10/15/- complete.

48in. x 12in. x 15in.—25 gu.

Pony brass, black & gold, and cream. Also plain stands

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18 x 10 x 36	—	27/6
24 x 12 x 36	—	47/6
30 x 12 x 36	—	52/6
36 x 12 x 36	—	57/6
42 x 12 x 36	—	62/6

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Constant Temporal	—	24/-
Springfield In./Adj.	—	15/-
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Mercury	each	4/6
Gem	—	4/6
Plastic Backed	—	4/6
Spirit Blue Gem	—	5/-
"Ea-Ea" Dummy	—	4/6

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Geo-Well	—	35/-
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Hy-So "A"	—	136/-
Hy-So "B"	—	165/-
Hy-So "C"	—	194/-

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25w., 40w., 60w., 75w., 100w., 120w., 150w.	—	16/-
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Receptor	—	19/-
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Swirl Away	—	46/6

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Glades Densa	—	1/-
Hydrocotyle	—	1/-
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Sagittaria nutans	—	1/-
Sagittaria nitida	—	1/-
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Amazon Chain Sword	—	2/6
Duckweed per portion	—	1/-
Algae per portion	—	2/-

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Hydro Flakes	—	1/-
Reunion	—	1/6 and 2/6
Reunion Frymish	—	1/6
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FULLY-GLAZED AQUARIUMS

Pressed Steel	Angle Iron
12 x 6 x 6	12 x 12 x 15
14 x 8 x 8	12 x 12 x 15
16 x 8 x 8	12 x 12 x 15
18 x 10 x 10	12 x 12 x 15
24 x 12 x 12	12 x 12 x 15

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Brite Shrimp Eggs	2/6 and 4/6
Cultures of	—
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Neat Worm 2 oz.	13/6
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Founded in 1924 as "The Amateur Aquarist"



THE BUTTS, HALF ACRE, BRENTFORD,
MIDDLESEX
Telephone: ISLeworth 6221
PUBLISHED MONTHLY

SUBSCRIPTION RATES

The *Aquarist* will be sent post free for one year to any address for £1 15s. 6d. Half-yearly 17s. 6d. Canada, U.S.A. \$5.00 yearly; \$2.50 half-yearly.

QUERIES

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Our Cover

"Nigger Barbs"

VOL. XXXI No. 11

1967

British fish hit by plague from Ireland

by P. F. Capon

IN *The Aquarist* of August 1966 I reported the existence of a disease that was afflicting Irish fish. The disease had reached plague proportions, Salmon (*Salmo salar*) being the fish that were dying in the greatest numbers.

The hope was expressed that the disease would be contained but unfortunately it has now broken out in Cumberland, Lancashire, and the Midlands.

The disease appears to start in the mouth region as a cotton wool-like growth, then follow sores that break out on the fishes' bodies as the disease takes hold. Fungus follows as a secondary infection giving the fish a white appearance.

Anglers have described the afflicted fish as "looking as though they were covered in white-wash" and as "resembling a rotting cauliflower stalk".

The fish appear irritated and abnormally restless in the first stages of the disease. In the final stages of the disease they offer no fight at all and may be removed from the water by hand. Their sense of direction appears to be impaired as they tend to drift into the bank. This drifting into the bank may, of course, be simply due to the weakening effect of the disease.

The last stages of the disease are apparently an infection as foot and mouth disease in cattle and the rate of spread of this fish disease has led it to be compared with myxomatosis in rabbits.

Continued on page 238

Going marine—from the beginning

by T. Ravensdale

Marine fish, without doubt, are the most colourful creatures ever created. From the amazing Clown fish to the weird Sargasso fish all, in time to come, will be a common sight in our aquariums. Their colours have to be seen to be believed and once a beautiful marine set-up has been viewed by an enterprising enthusiast he finds it difficult to remain satisfied with his own drab tropicals.

Marine fish keeping is by no means a beginners' game but any average aquarist should have no troubles that are not already associated with fish keeping provided he sticks to the basic rules.

MARINE fish are as expensive as they are colourful and for this reason it may be better to start simply and learn the easy way. Don't rush out and buy the finest equipment available; experiment first—by the time you tire of the simpler species you will have learned enough to help you with the more expensive specimens.

Invertebrates come in all shapes and sizes but as a start let us try the simple anemone with perhaps a crab or two to add colour.

There are basically two types of anemone generally available; the cold water variety (which can be collected from any beach) and the more expensive colourful species of tropical anemone on sale in those shops specialising in tropical marine fish. At this juncture I propose dealing with the former, for all that is required to start your specimen tank is a brace of plastic buckets, a long handled net and a set of strong fingernails. If you are able to arrive at your nearest beach in time to catch the tide going out

your search will be less tedious for the sea anemone is easier to spot at this time. The pools left on the beach will trap numerous marine life but do not overcrowd your bucket. Some shrimps and most crabs will live quite happily with the anemone and offer considerable amusement but overcrowding on the journey home will most certainly result in a gooey mess at the bottom of your bucket.

The most common anemone found around our coast is the brown or common *Aequorea* ranging from deep brown when closed to bright green when inflated.

These creatures, which range from $\frac{1}{2}$ in. up to 4 in. in size, adhere to the underside of pier supports and on the lower edges of rocks. They are quite easy to see when open but rather resemble a dried fig when closed. Those attached to shells should be ignored for we do not want wild shells in our tank as they act host to a multitude of unwanted microbes.



Sargasso fish emerging from a tangled mass of seaweed. This fish is one of the many marine fishes for the avid enthusiast. The fish harmonises successfully with its surroundings.

The adhesive power of the sea anemone is remarkable and is actually obtained through a series of tiny suckers operated by transparent muscles which stem from the mouth. This mouth not only receives food but regurgitates it when digestion is complete or impossible. A new digestive system grows occasionally whereupon the old one is promptly ejected. Damage to the mouth of an anemone will often result in the development of a new one, and it is therefore with great caution that one should attempt to remove this delicate creature from whatever substance it adheres to. This is where the fingernails come in. Gently prise the anemone from its mooring by sliding your nail under the skirt, taking great care not to split the skin. Half fill your bucket from a clear pool and place your first specimen carefully on the bottom where it will promptly curl up like a hedgehog and will not be harmed by small crabs or such in the same bucket. Should you decide on a crab or two make sure they are of the green variety and not more than 1 in. in size—red crabs should not be collected as they attack all and sundry. Incidentally, these small crabs, believe it or not, will live quite happily in the freshwater tropical aquarium and are remarkable bottom cleaners.

When you have collected all your specimens you must now wait for the tide to return before filling your second bucket with fresh clear sea water with which to fill your aquarium. If, however, you intend keeping life other than anemones or crabs such as fish or shrimps, do not use sea water. Synthetic sea salt (not crystals) such as Tropic Marin or Meersalz obtainable in pet shops is far cleaner and free of undesirable plankton which soon dies in the aquarium. The density of this home-made salt water should not exceed 1.025 (approx $\frac{1}{2}$ lb. per gallon). Table or cooking salt is not good enough.

Water loss through evaporation can be compensated by tap water for only pure water is lost, not the salt.

Setting up the invertebrate tank

The best type of tank for salt water use is one of all glass construction although a plastic one will do. Ordinary metal framed aquaria, unless nylon coated or stainless, will not do nor will any other metal objects in or above the water.

Sand taken from the sea shore will suit anemones or crabs but should not be used if shrimp or fish are added; silver sand, as used for canaries, will suit better.

A piece of flat stone or slate must be placed on the sand for the anemone to live on. Now fill the tank with fresh sea water and remove the anemone from its transit water by hand—it will not harm you and will soon take root on the slate.

Feeding

Feeding is simple; tubifex, guppies or fresh shrimp etc. are all readily accepted by the large mouth situated in the centre of a seething cauldron of tentacles which wave about continuously questing for food. The coldwater anemone, unlike its tropical cousin, finds it most difficult to trap live food so feed *near* the arms which will immediately close in a vice-like grip engulfing the food in seconds. In its

natural state the anemone injects poison into its victim as soon as the tentacles close but this power seems to deteriorate in captivity. The extraordinary connection between the clown fish and deadly poisonous anemones to which it appears to be immune, plays a vital part in the control of diseases in tropical tanks but this subject will be dealt with in a later article.

Do not overfeed your anemone (twice weekly is sufficient) nor should you worry too much about correct feeding for although its mouth will rarely refuse food it will also regurgitate all unwanted food along with its natural wastes in the form of a slime-coated ball ejected at odd intervals. These refuse packs, neatly wrapped and perfectly spherical, should be disposed of immediately as they contain highly undesirable substances. I recently dissected one of these disposal bags to find a perfect tropical red crab, complete with limbs and hairs.

Breeding

Reproduction of the anemone is amazingly simple as a pair is not needed. Pregnancy is not difficult to ascertain for the animal begins a series of contortions a few hours before birth commences. A miniature of the parent is forced out of the mouth (which contracts to a pin point), and is attached by a thin thread. The young soon drifts off but will be attached to the parent for some time until another 'jth' baby follows. This process is repeated several times until soon there are a number of tiny offshoots all strung together across the slate. After an hour or so the 'umbilical cord' disintegrates and the young are able to find their own 'roots'. Growth is far more rapid at first and the young are soon able to cope with the same food as the parent but, after a month, growth slows down; this may be due to the creature's confinement in the aquarium. This confinement must be artificially overcome for all marine creatures when confined are subjected to a greater restriction than are those from fresh water. Most tropical freshwater fish live in small rivers or rice paddies but the oceans are phenomenally large when compared even to the mighty Amazon. Therefore the answer is obviously a good circulation device or filter. Filtration must be fast and effective, especially if shrimp or fish are present. Incidentally, should you decide upon shrimps, do not be alarmed to apparently find more shrimps than when you started one day, for the shrimp is transparent and when it discards its shell, as it does periodically, it leaves a perfect phantom replica complete with eyes and feelers.

Another remarkable phenomenon you may witness in an invertebrate tank (tropical) is the 'ganging up' of crabs on anemones. The hermit crab often tickles an anemone until it grabs a feeler. It then places it upon its shell and entices a fish into the anemone where it is strung to death. The villains then share their booty. Another crab, when endangered, actually tears anemones from their roots and hurls them at the aggressor!

One last point—don't worry about replenishment; anemones can live for up to 300 years! It is indeed an interesting world in the invertebrate tank.

In the next article I shall deal with going Tropical and the question of water, filtration and preparing for the fish.

our readers



write

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

Address letters to The Editor, *The Aquarist*,
The Butts, Half Acre, Brentford, Middlesex

Elodea and Carbon Dioxide

MR. HERING takes me to task (Our Readers Write, October) for my attack on R. E. Macdonald's article "Gas Embolism". I would agree with Mr. Hering that the manner of my criticism was, to say the least, over-enthusiastic.

I must beg to differ with both W. Hering and R. E. Macdonald as to the ability of *Elodea* to extract carbon dioxide.

The pH of 10 stated by Mr. Macdonald to be produced by *Elodea* by the production of calcium hydroxide from calcium carbonate, means that the plant is existing in an almost saturated solution of calcium hydroxide.

I recently carried out a test by placing *Elodea* in a saturated solution of calcium hydroxide. I expected the plant to die in a day or two, but the plant did not begin to rot until a week had elapsed. However, on the third day I examined leaves of this test specimen under the microscope in comparison with a control. The test specimen contained only about half the number of chloroplasts of the control; initially both control and sample had approximately the same number. To my mind the calcium hydroxide was having an effect on the *Elodea* at this stage.

After three weeks, to my surprise, the test plant had stopped rotting and actually made a little growth, although not as much as the control. At first sight this would appear to bear out Mr. Macdonald's contention in that a pH of 10 did not apparently harm the plant, but a closer examination of the bottom of the plant container revealed a white precipitate; analysis showed this to be calcium carbonate. A check on the pH of the water showed that it had dropped to 9.9, no calcium hydroxide could be detected but a trace of calcium bicarbonate was found in the water.

Elodea is apparently a much tougher plant than I had anticipated. It is retarded by a high pH caused by solution of calcium hydroxide, but would appear to be able to rectify the pH by means of the carbon dioxide that it expires during respiration, converting the hydroxide into carbonate or even bicarbonate.

The assumption that a pH of 10 is due to calcium hydroxide is not necessarily true as a saturated solution of calcium carbonate can, under some circumstances, attain a pH of 10.2. Calcium carbonate is not normally regarded as being soluble in water but in fact it is slightly soluble; 0.0018 grams in 100 grams of water. It is interesting to note that calcium hydroxide has a theoretical pH of 10.17. If the water in which the *Elodea* is growing is tested for pH and found to have a pH of 10 this would be due to either calcium hydroxide or calcium carbonate.

In any case, a pH of 10 is unlikely; Britton states that the buffer action between bicarbonate³ and carbonate ions is so great in natural waters that it prevents attainment of pH 10.

B. Cass also takes me to task for stating that "to remove any carbon dioxide from calcium carbonate it is necessary to heat to between 800 and 1000 degrees centigrade." Admittedly acids will release carbon dioxide from calcium carbonate but the other product is not calcium hydroxide but a salt. For instance, if the acid were hydrochloric acid then carbon dioxide would be evolved and the other product would be calcium chloride.

Yours faithfully,
P. F. CARON,
Publicity Officer,
Southend, Leigh and
District Aquarist Society.

References—³Hatchell, Z. Unterw. Natur - Ges., 1912, 43, 184.
⁴U.S. Britton, Hydrog. Jena, vol. 2, p. 137.

Any More?

WITH reference to a letter in the November edition of *Aquarist* concerning the misconception of a Mata Mata Turtle.

I am writing to inform you that we also have a living Mata Mata Turtle in our aquarium which I believe to be exceptionally rare in this country.

I wonder how many aquariums have Mata Mata Turtles believing theirs to be individualists. Our specimen has been in our aquarium for two years, he is 25 in. long with a 14 in. shell and very active.

Yours faithfully,
J. HAWCROFT,
Bolton, Lancs.

Belle Vue Festival

BEING a fairly new society we were all looking forward to our trip to the British Aquarists' Festival at Belle Vue on Sunday, 30th October.

We were not disappointed, the fish on show were first class and the society stands were excellent, but one thing stood out for comment. Some societies were enterprising enough to name the fishes in their tanks but alas, others thought we should know them all. But of course, we didn't. Please can we have the names at open shows in the future?

Grateful thanks to the Northern Federation for their

THE evident concern expressed by Mr. S. C. Brown in his letter published in the November edition of *The Aquarist*, concerning the circuit of "Anonymous year Aquarium," previously published in June, arises from a misinterpretation of the circuit diagram.

Contrary to his assertion, all the switching is effected in the live pole of the supply. The lower connection shown within the dotted time switch in the original diagram indicates a straight-through connection and is not a switch. It was depicted in this manner as it is used in small time switches to bring both the live and neutral into the time switch, and to switch the circuit on a single pole.

It may be noted that no means of energising the time switch is shown in Mr. S. C. Brown's diagram.

Electric Safety

We have also three slide lectures for hire. Unfortunately at the moment our lecturer will have to accompany these, but any society interested within easy travelling distance may write in and book a date and we will come over and put on a slide lecture for you. These Slide Lectures are as follows:

NO. 1. THE AMERICAN SCENE—50 slides on the activities and fish of an American society.

NO. 2. BRITISH VUE FESTIVAL, ETC.—50 slides of the 1966 British Aquarist Festival, the fish, displays, etc., also of members' furnished aquaria.

NO. 3. THE BRITISH SCENE—50 slides of members' fish, set-ups, furnished aquaria, etc.

Please contact: Mr. R. H. Hampson, The Heathlands, Goodland Lane, Horsforth, Nr. Leeds, Yorks.

NO. 1. WHITE SPOT (Ichthyophthirius)—do you really know what is the basic cause of fish becoming infested with this disease?

NO. 2. AQUARIUM MANAGEMENT—why this is so important, particularly when breeding is being attempted.

NO. 3. FOODS AND FEEDING—are commercially prepared foods really nutritious, particularly when compared with foods obtainable from the normal commodities available in the average home?

These Tape Lectures will run for approximately one hour, and the cost to hire them, 10s. each plus 2s. postage. Mr. Whitten has also produced booklets which will be a complete primer recording of each lecture, as he feels that very few people remember a lecture's most salient points a few days later; these are of 25 to 30 pages, and will be offered to the hiring societies on a sale or return basis, and societies should quote a sufficient number of booklets that they would like sent with the sale of return basis. They are asked to return only 1s. 6d. of the 2s. asked for the booklets, this giving them 6d. for each copy sold, so as to offset the cost of the hiring of the Tape Lecture. They are asked to return only 1s. 6d. of the number of booklets that they would like sent with the sale of return basis, and societies should quote a sufficient number of booklets that they would like sent with the sale of return basis.

The first three of a series of 30 are due to arrive no later than January, and we are now taking bookings from any society or individual who would like to hire them; the titles of the first three Tape Lectures are as follows:

PROGRAMME AIDS

We have successfully completed negotiations with a famous Canadian author and lecturer, Mr. W. L. Whitten, F.Z.S., for the sole British distribution rights of a series of Tape Lectures which he is now publishing.

The first three of 30 are due to arrive no later than January, and we are now taking bookings from any society or individual who would like to hire them; the titles of the first three Tape Lectures are as follows:

NO. 1. WHITE SPOT (Ichthyophthirius)—do you really know what is the basic cause of fish becoming infested with this disease?

NO. 2. AQUARIUM MANAGEMENT—why this is so important, particularly when breeding is being attempted.

NO. 3. FOODS AND FEEDING—are commercially prepared foods really nutritious, particularly when compared with foods obtainable from the normal commodities available in the average home?

I WOULD like to say how much I appreciated the help of the generous and kindly concern shown in the response to the request in November issue for a home for my terrapin. A good home has been forthcoming, I am grateful to each one who wrote.

Yours sincerely,
R. COMELY,
Swiss.

Good Home for Terrapin

Yours Sincerely,
I. R. MARSH,
Loughborough Rd.,
Nottingham.

HAVING attended the Hendon congress, and the Aquarist Festival this year, I am of the opinion that there must be the basis for a world bearing show between effects of the Northern Federation and the Hendon A.S. Here we have an ever flourishing display, enthusiastically supported, while in London there want a quiet seat to hear what, in my opinion, was the finest lecture team I have ever heard.

Roy Stanger, probably England's leading club expert, an amusing film on Angels, followed by a talk by Bob Calver, who must be the finest lecturer ever to support our hobby, made an unforgettable night. Can't the two get together so that all England could hear the performance who would grace any programme with his knowledge and wit?

Satisfied customer

In his article about "Ceratopteris thalictroides" (*The Aquarist*, October, 1966), Mr. Whittaker writes that he had little success with the fern in fairly alkaline water. But my experience with the fern in Indian ferns, particularly the broad leaf variety, is that they thrive extremely well in alkaline water. The pH is about 7.6 to 8.0 throughout the year and the total hardness varies from 100 p.p.m. to 250 p.p.m. during the winter and spring up to 400 p.p.m. at the end of the summer. The Indian fern, especially when planted in large tanks, say 48 in. by 15 in. by 18 in. high, gets very large. The fronds reaching a length of 15 in. and 1 in. thick, and the fronds sometimes exceed 20 in. (most of the leaf floating as the tank depth is only 18 in.). Fronds are produced in great numbers on the edges of the leaves, particularly if the leaves are severed and left to float. The water surface soon gets so thick with plants that little light penetrates to the bottom of the tank and the floating plants have to be removed. I have found that which in my case is obviously acidic. I have found that plants such as *C. thalictroides*, *V. spiralis*, *A. malincolanum*, etc., thrive and proliferate in hard and alkaline water but which are supposed to grow well in soft, acidic water, acidic rooting medium. The source of lighting, whether natural, fluorescent or incandescent, does not seem to make any difference to the growth provided that an intensity is correct for the type of plant grown.

M. H. KIRMAN (Oxon.)
Baghdad, Iraq.

Furthermore, it was explicitly stated in the article that, when connecting the override switch, ensure that it is on the same pole as the time switch contacts and does not bridge the supply, causing a short circuit.

R. G. BOND

Livebearers—breeding and general care

by M. J. Parry

TO my mind one of the greatest joys in maintaining a tropical aquarium is the obtaining of good quality young stock, raising them through the various stages to sexual maturity when, with a little luck, patience and know-how on the part of their possessor, they will reward him eventually by breeding and thereby restarting the entire process.

To a person embarking upon the aquatic hobby, the difficulties to be encountered in the successful breeding of tropical aquarium fishes may seem insurmountable; it should be borne in mind, however, that the Axelrods, Innes's, Schulte's, Voederwinklers' and others who personify the experience and backbone of this fascinating hobby today were mere novices a long time ago. The satisfaction to be gained in successfully breeding and rearing tropical fish is immense and with new species appearing on the market at the rate of dozens each year, the opportunities for the adventurous breeder are unlimited.

Livebearers (live-bearing tooth carps, family Poeciliidae) popularly represented by such fish as the Swordtail (*Xiphophorus helleri*), Guppy (*Lebistes reticulatus*), Platy (*Xiphophorus maculatus* and *X. variatus*), and Molly (*Mollienesia* spp.) are undoubtedly the most widely and regularly bred of all aquarium fish, partly, no doubt, through their ease of propagation and, perhaps more importantly, because they are species kept by practically every aquarist from modest beginner to expert. The aim of this article will be to discuss in as much detail as possible the means, both artificial and natural, by which real success with livebearers is obtained.

The majority of livebearing fish available to the hobbyist

are omnivorous in diet (i.e., capable of accepting foods which are animal and vegetable in content), *notifex*, white-worm, *daphnia*, shredded earthworm, boiled spinach, scraped carrot, algae, etc. being accepted with equal relish. It should be remembered when feeding live foods, however, that small digestive organs are common to the livebearer and such foods must be chopped or shredded as necessary. Adult fishes should be fed once per day; the younger the fish the more often they will require food, small amounts being given at each feeding. The actual amount to be fed is entirely dependent on the species of fish kept, the temperature, and the relative merits of the food. White-worm, for instance, is more fattening than either *daphnia* or *notifex*, and should, therefore, be fed more sparingly. The old maxim "little and often" still holds very true, feeding being continued at regular intervals until no further interest is shown, and the food sinks to the aquarium bottom. After a little experience in feeding by this method the amount required on subsequent occasions can be gauged with ease.

A water temperature of 75°F is considered by many as the lowest at which the livebearer will thrive. This belief, however, is totally incorrect as the livebearing species show a wide tolerance to changes in temperature (provided that they are gradual), 65°F suiting them equally as well (if not more so) than 82°F. It is certainly true that the fish breed more rapidly and show more intense colouration at higher temperatures, but so too is the fact that consistency in this provision ensures a shorter life-span for the fish. The gestation period of the female livebearer is affected by the prevailing temperature; such a period from the time of her fertilization by the male is approximately



The livebearer community. Platy make a bright and colourful addition to the community.



A pair of red swordtails (male, left)

3 weeks at 82°F and 4 weeks at 75°F. It will be noted, therefore, that the gestation period can be accelerated or lengthened within certain confined limits. It has been stated by several knowledgeable aquarists that the longer the period of gestation the better, the result being more active and healthier fish. This, however, is the subject of some debate, and whilst it remains my personal view, the answer for the individual aquarist must surely lie in his own experiments.

Water, as we are aware, is either acid, neutral or alkaline in nature, its various degrees of acidity or alkalinity being gauged by what is known as the pH scale—a scale denoting the particles of potential hydrogen in any given solution (those readers wishing for further enlightenment on this somewhat tricky, and to my mind much overrated aspect of our hobby are recommended to study a letter by Mr. P. S. Mackinnon published in the October, 1966 issue of *The Aquarist*). Most of our common livebearers, excluding the Molly and perhaps the Guppy (which has been known to live and breed in brackish water) are appreciative of slightly acid water, with an approximate pH of 6.8. Mollys however, are a much different proposition as they require water of a distinctly alkaline nature, which, in my own case was brought home only too forcibly some years ago when placing three Lyretail Mollys in a tank specially catering for members of the characin family, the water having a pH of 6.00. All three fish were dead within 24 hours.

With most species of fish their method of reproduction is

external, that is to say that the eggs are expelled freely by the female, and are then fertilized by the male in his shedding of milt upon them. With livebearing species, however, an organ known as the gonopodium (which takes the place of the anal fin), has been developed in the males. This organ allows the females' eggs to be fertilized within the body cavity where, upon hatching, they undergo further development so that when the young appear they are able to fend for themselves immediately. The newly-hatched fry of the egg-laying and egg-scattering fish are helpless at first and unless protected in some way or other are very vulnerable to attack. It should be stressed that the live-bearing species of fish are in no way mammals, there being no direct connection between the bloodstream of the parent and offspring, the body cavity being merely used as an "incubator". The sexes of livebearers are quite easily defined, the female being somewhat larger and deeper bodied than the male, her pectoral, pelvic and anal fins being well rounded, whilst in the male the pectorals are rounded and the pelvic fins pointed.

Breeding, as can be imagined, is easily accomplished, even in the "community tank", though the great danger in the allowance of their breeding under such conditions are the cannibalistic tendencies of both parents, and other occupants of the aquarium. Signs of the female bearing young are best revealed by the area around the rear of her anal fin becoming darkened coupled with a growing roundness of the body. Upon the appearance of such signs it will be found a wise policy if it is desired to save the fry, to



Mollenisia velifera



Speckled *Mollenisia zhenops*

transfer the female to an isolated aquarium where she may rest safe from the perpetual advances of the amorous male and deliver her brood in peace. Such an aquarium (18 in. x 10 in. x 10 in. being adequate) should be well cleaned with mature tap or rainwater added to a depth of 6 in. In order to provide effective cover for the fry immediately after birth the aquarium should be heavily planted with such bushy plants as *elodea*, *nitella*, *cubomba*, hornwort, etc., with surface cover provided by any of the floating plants, examples of which are *riccia* and duckweed. Upon their release from the sanctuary of the female's body, the newly born fry rise to the surface of the water in order to fill their swim-bladder with atmospheric oxygen. With the removal of the female, feeding should be commenced two days later (and after the absorption of the yolk-sac) with newly hatched brine shrimp and micro-worm, followed in due course by finely sifted *daphnia*, chopped *tubifex* and white-worm. Growth of livebearing fry is rapid, the best specimens forming the nucleus of future breeding stock.

In conclusion I would add the following words of caution—never use breeding traps; their usefulness has never been proved above that of the isolation method and, to my mind, they do much more harm than good; and never, never, mix any colour varieties of a given species, as they will readily interbreed, destroying completely the pure strains that every aquarist worth his salt seeks for. If more than one colour (or tail) variety of a species is kept, house males in one aquarium and females in another in order to prevent certain and unwanted hybridisation.

"Bioluminescence" an unusual exhibition

by M. Lorant

THE American Museum of Natural History has recently opened a spectacular new exhibition in the Museum's Hall of Biology of Invertebrates. It is called "BIOLUMINESCENCE".

Bioluminescence—the emission of cold light by living organisms—is illustrated in seven dioramas mounted in large cylindrical tanks. Using a changing cycle of incandescent and ultraviolet light, animal habitats are shown in daylight and darkness. In the dark portion of the cycle the greenish light of translucent jellyfishes, the bluish-white light from a colony of hydroids, the glow of Antarctic krill, and "headlights" on a South American click beetle are displayed.

Suspended above the dioramas are large flashing models of four species of fireflies which appear to be in flight against a dark sky.

Bioluminescence occurs when chemical reactions take place within the body of a luminescent organism. In the most thoroughly investigated reaction, oxygen combines with luciferin in the presence of an enzyme, luciferase. As a result, "cold light" is formed.

Marine animals, among which bioluminescence is most common, are seen in five of the seven tanks in the exhibition. A study in suspension is a diorama of jewel-like comb jellies and jellyfishes floating offshore in bay waters. Comb jellies, or ctenophores, are marine animals which have transparent bodies that give off a slow wave of intense blue-green light when they are disturbed.

A fiery struggle can be seen in a diorama showing creatures from the depths of the sea. The minute fierce-looking fish, *Stomias boa* (a dragonfish), and its relative, *Photomias guernei*, are seen attacking shrimps and squids. The dragonfish has a large tooth-filled mouth with a light on the end of a barbel that is attached to the lower jaw. The shrimps and squids in retaliation are discharging their own clouds of luminous material, which hides them from the minnow-sized predators. These shrimps have other light-producing organs on their bodies which glow when they swim quietly.

One diorama shows the luminous, mushroom-like fungi, *Mycena lux-coeli*. Another shows *Pyrophorus*, a fire beetle, in the background of a South American rain forest.

The model of four male fireflies of the genus *Photuris*, enlarged 24 times, are mechanized to produce light signals exactly as these fireflies do in nature. A firefly of either sex can recognise another firefly of the opposite sex by its distinctive flashing signal. Each firefly, as the exhibit demonstrates, has its own rhythmic pattern of flashing. (The entomologist who first described several of the species shown in the exhibit reported that he was able to attract male fireflies himself by hiding in foliage and mimicking the light signals of the female firefly with a flashlight that he covered with green leaves.)

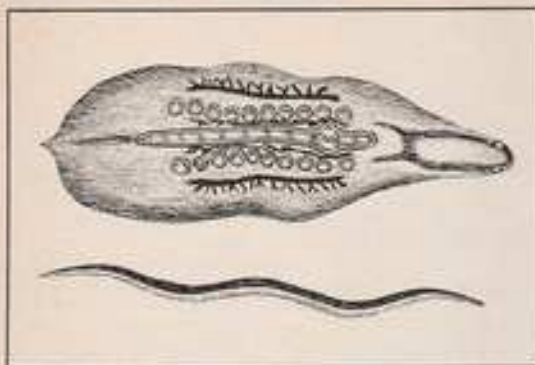
Models of Protozoa, tiny one-celled animals, are mounted on clear plastic panels. This gives them the appearance

of being suspended in water, as they are in nature. The intricate hand-blown glass models were made by Herman O. Mueller, who created hundreds of models of invertebrates at the Museum over a period of 40 years. Mr. Mueller made his freshwater animal forms after studying them through a microscope; he patterned the deep-sea models after the drawings in a classic monograph by the German biologist, Dr. Ernst Haeckel.

Of particular interest in the exhibition is the variety of complex forms of protozoans. The models, enlarged in some cases many hundreds of times, show the intracellular structures of these microscopic creatures. The models include two structures of a mesh-like tissue (one in the shape of a blimp and the second resembling a tiny peaked hat), a skeletal framework that looks like a tiara, and spheres that are covered with spine-like projections. Models of minute rotifers, found around the world in ponds, lakes, damp soil, and other watery locations, are shown.

A giant pink hydroid, found in ocean depths near Japan, dominates the section devoted to glass models of colonial organisms. These marine animals include jellyfishes, sea anemones, hydroids, and corals.





The Junior Aquarist

Mesostoma ehrenbergi

Rhabdocoeles flatworms

by Bill Simms

A TINY leaf-shaped creature, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, undulating over the gravel, or sometimes even swimming freely, is a startling sight in any aquarium. It looks very much like a leech and one wonders how it could have got there. It is probably a flatworm, of which there are many kinds in Britain.

The drawing shows one quite common species, *Mesostoma ehrenbergi*, which is usually pale brown, transparent, with its internal organs showing yellow and dark brown. When seen sideways on it is very thin—see upper sketch.

Flatworms have very fine hairs, or cilia, all over their bodies. It is on these that they move, and in stagnant water the hairs promote a slight movement to provide oxygen. These creatures are very tenacious of life for in drought they can encase their bodies in a protective coating of slime, and if unable to find food can survive for years without it.

These are dangerous creatures in any aquarium, for most of them are carnivorous, and can envelope their prey in slime. This same slime can occasionally be seen behind them when they are travelling over weeds or pebbles.

It is obvious that they are most easily transported on plants and any large collection of water plants can carry a few. Nevertheless, they are slow-moving creatures and easily caught so if a good watch is kept for them, there should be little trouble.

Reproduction of these flatworms is in two ways. They are all hermaphrodite, and so fertilise themselves. Young flatworms have a number of young ones develop inside them, and at a certain stage these babes eat their way out of the young parent. This appears to cause no harm to the parent's body, and in fact several generations are produced in this manner.

Later, when the flatworm is fully mature, instead of producing new babies in its body it develops some eggs which can often be seen through the transparent body. These eggs are never laid but remain intact until the

flatworm dies and disintegrates. Then, and only then, do the eggs hatch and the new cycle of life begins.

With such a generous means of reproduction, the ability to go without food for long periods, and their means of encasing their bodies to withstand drought, it seems certain that these particular kinds of flatworms are well fitted to survive.

One or two chemical treatments for aquariums have been described but they are rather critical in quantities and are also poisonous. I prefer to watch for the flatworms and use long tweezers to pull them out.

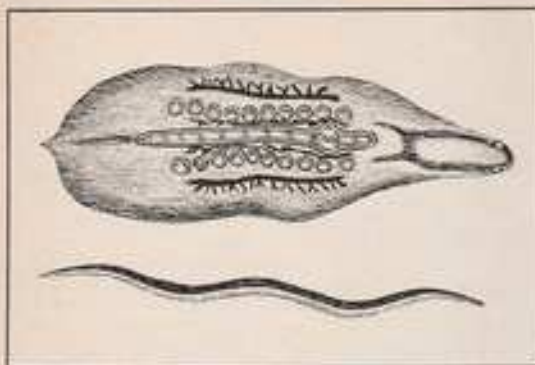
Book reviews

by Jack Hems

'Planning and Decorating the Aquarium' by Wilfred Weigel. 'Food for the Aquarium and Vivarium' by Willy Jocher. Translated by Gwynne Vevers. Studio Vista. 10/6 each.

THESE interesting, well-written, and informative books—the very latest in this fine series of aquarium paperbacks—should be bought and treasured by aquarium lovers everywhere.

'Planning and Decorating the Aquarium' is essentially for the aquarist who is anxious to give his fishes the best possible conditions amid an environment of superlative beauty and charm. The first few pages—there are 78 in all excluding the index, which could have been better—outline the basic needs of successful aquarium management. Next follows sound advice on aquarium design and construction, lighting, filtration, including the measures to be taken against tobacco smoke entering the aquarium, best conservation by a kind of double glazing, and the like. It is evident, as one turns the pages of this book, that Wilfred Weigel's experience with fishes in captivity has been long, enquiring and adventurous. The middle of the book is devoted to the aquarium as a decorative accessory in the artistically furnished home. In these pages the author deals with aquariums as room dividers, aquariums as part of bookshelves, and aquariums tall enough to accommodate fishes in the basement, so to speak, and swamp and epi-



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phytic plants and suitable amphibians on the upper floors. Paludarium is the right word for this type of set up. Finally, the art of creating beautiful underwater scenes is fully treated and supplemented with tables showing the plants and fishes likely to be found living together in the wild.

'Food for the Aquarium and Vivarium' is worth its weight in gold. Nothing else quite like it has been published before. All kinds of food suitable for fish, amphibians and reptiles is covered in its 63 pages. Hints on collecting live food from outdoors, breeding such uncommon customers as locusts and crickets in heated cages, stuffing empty snails' shells with pieces of veal to deceive faddy lizards, and sprouting wheat for greenfood eaters makes fascinating reading. The author rounds off this writing book with two pages entitled 'Who eats what?' In these two pages the preferred foods of many fishes, chelonians, lizards, snakes, amphibians and marine animals are given. The many line drawings which illustrate both these books are excellently done.

L. Sessiliflora

by B. Whiteside

BELONGING to the family Scrophulariaceae, to which also belong the Bacopa species and land plants such as foxglove and anemone, *Limnophila sessiliflora* is more commonly known as, and sold under the name of, *Ambulia*. It is a plant which closely resembles *Gabomba* and which needs similar conditions for growth. Its one advantage over *Gabomba* is that it will grow in water which is not quite as soft as that necessary for *Gabomba*, but it still needs fairly soft water to meet its needs. I find the plant less attractive than *Gabomba* species but if you cannot grow *Gabomba*, it is worth while giving *L. sessiliflora* a try. In its own right it earns a place in any aquarium which has relatively soft water.

Ambulia, as it is incorrectly called, has leaves of a light, bright green colour, and these are produced in whorls of from about 4 to 8. The leaves are about $\frac{1}{2}$ in. broad and range in length from about $\frac{1}{2}$ in. to $\frac{3}{4}$ in. Young leaves at the top of the plant are relatively entire compared to the finely divided more mature leaves whose segments are slightly broadened at their ends. The plant's stem is fairly strong in contrast to the fine leaf formation.

Under suitable growing conditions the plant will soon reach the water surface and grow above water. Adventitious roots are produced from the leaf nodes, and these stretch down towards the gravel. These rooted pieces may be used as new plants if cut off beneath the roots and planted, after removing the lower leaf whorls. Ordinary stem cuttings can be taken for propagating material. Flowers, if they are produced, are white with lilac markings, and these

may set seed. *L. sessiliflora* looks well when planted in groups to hide the rear corners of the aquarium or when planted along the sides to mask the side glasses.

My own plants have grown well in water at 78°F, with pH 7.0 and DH4-5°. No special feeding seems necessary although an under-gravel filter seems to help produce



stronger growth. About 5 hours of artificial lighting per day seems enough for the plant, this being enough for my aquaria and preventing the growth of algae on the plants' leaves. Prices for a plant of *Limnophila sessiliflora* range from 8d. to 1s., and the plant is usually advertised as *Ambulia*.

Win a complete tropical fish tank or £15 voucher

Do you keep aquarium or pond fish, frogs, snakes, terrapins or lizards? If the answer is yes, why not enter our competition and submit an article on how you keep your pets? The essays will be judged in three age groups i.e. those between 8-10 years, 11-13 years and 14-16 years on the 28th February, 1967.

For full details write to:

The Aquarist and Pondkeeper (Entry Form), Buckley Press Limited, The Butts, Half Acre, Brentford, Middlesex. Please enclose a stamped addressed envelope.

The plague

by P. F. Capon

The Ministry of Agriculture has had the Government Research Laboratory investigate the disease. The Laboratory reported that the disease was caused by *Chondrocyclus salmonis* but there appears to be doubt as to the causative agent amongst other authorities.

Research laboratories in Scotland and Eire do not agree that *colossalis* is responsible. One Irish authority claims to have isolated an organism related to but different from *colossalis*. A Danish worker has identified it as *colossalis* whilst an American expert who is familiar with the disease caused by *colossalis* in connection with his work in fish hatcheries disagrees. Another American authority claims that the disease is not caused by *Chondrocyclus salmonis* which is a bacterium but by a virus that attacks the fishes brain.

Diseases of fishes are difficult to associate with a specific organism as a fish weakened with disease rapidly becomes host to a multitude of organisms. Diagnosis of a disease by examination of the dead or dying fish can often be misleading owing to the large number of different types of organism present.

Whilst disagreement reigns as to the causative organism the authorities appear to be agreed that the disease thrives as the water gets colder. They state that the disease does not appear to spread at temperatures above 45°F.

Axelrod² states that mollies are particularly prone to *colossalis*. Mollies are very rarely kept at temperatures as low as 45°F., so it would appear that either the disease of salmon is not *colossalis* or possibly the salmon and trout only pick up the disease when weakened by the cold weather.

If salmon afflicted with the disease are removed from fresh water and placed in sea water the disease appears to clear up but whether it is completely cured or able to break out again in fresh water is not clear.

It has been suggested that salmon pick up the disease on returning from their Greenland feeding grounds as they pass through Irish offshore waters. This would appear to be at variance with the salt water cure, but possibly the fish can catch the disease in salt water but it is only when they enter fresh water, as they must to spawn, that it really breaks out.

Birds, especially gulls, have been blamed as carriers of the disease since they feed on the dead and dying fish. Anglers who fail to disinfect their tackle after fishing infected waters are also suggested as potential carriers of the disease.

The disease first appeared in Eire in the autumn of 1964, reoccurring in 1965 on a wider scale until in February

1966 up to 80 per cent. of the fish entering the River Blackwater were infected.

Irish authorities claim that the disease is now dying out but this does not appear to be the case for in the autumn of 1966 a new outbreak occurred in the River Foyle in Northern Ireland. If the disease is dying out this winter should see a marked drop in the number of diseased fishes in Ireland.

Fishery officers in Cumberland and Lancashire are appealing to anglers to stay away or if they must fish the waters to take extreme care in disinfecting their tackle, nets, boots, gloves, etc. Surely all fishing should be banned in the infected areas until the risk of carrying the disease is over.

The main efforts of the fishery officers in Cumberland and Lancashire have been directed to preventing the disease reaching the spawning grounds. Weirs are closed to fish which are thus trapped in the lower reaches. The fish are prevented from continuing their spawning "runs" until they are shown to be free of the disease or have died.

Eggs and milt may be taken from diseased pairs of fish, and the fertilized eggs can then be sterilized; the fry produced from these eggs are free from the disease but will of course readily succumb if placed in infected waters. The mortality of the hand spawned fry is very high in infected waters and very few live long enough to reach the comparative safety of the sea.

The material used to sterilize the eggs is not disclosed.

The disease has caused questions to be asked in the House of Lords. On November the 17th, 1966 Lord Champion, Minister without Portfolio, read a statement for the Ministry of Agriculture that said that similar organisms had been identified in the outbreaks in Cumberland, Lancashire, and the Midlands. More trout had been infected in Scotland and England than in Ireland where salmon were more prone to the disease. It was suggested that the disease was on the decline in England.

Lord Champion said that the Ministry was not completely satisfied that the disease was caused by *colossalis* as a number of organisms had been identified; the main organism present did, however, appear to be *colossalis*.

Lord Balfour requested that the Government issue a monthly statement on the progress of the epidemic.

The disease has caused an estimated loss of one million pounds in exports and tourism to Eire. Tourist losses due to the disease in England and Scotland have not been computed but it is known that in the Cumberland and Lancashire areas professional netmen netted 23,000 pounds weight of salmon in 1965. These salmon sell in the shops for around one pound per pound. These netmen will not be able to sell any of their catch this year.

So far the disease has not spread to the South of England. There were reports earlier in the year of its having been present in West Sussex rivers but luckily the epidemic was not present.

A disease that is reputed to have been similar to the present epidemic ravaged British rivers in 1877 for twenty years; let us hope that the present disease does not last that long.

The Minister of Agriculture has declared the areas where the disease has been confirmed as "infected areas"; this means that fish and eggs may not be sent out of the area. Whether the ban on movement of fishes affects aquarists or not is not clear. An enquiry by the author as to whether fishes kept by aquarists and pondkeepers are covered by the "infected area" order has to date not been answered by the Ministry.

There have not, to the best of my knowledge, been any cases of this disease amongst aquarists' fishes. But this should not mean that we should not take every care to insure that aquarium fishes do not come into contact with the disease.

Whilst it is by no means certain that tropical fishes in particular are able to catch the disease, every precaution should be taken when feeding "wild" live foods. Plants, and live foods collected from ponds and rivers containing fish are a potential source of infection. Even waters that do not contain fish could have the disease introduced to them by gulls and other water loving birds.

We know too little of the range of fishes affected by the disease to take chances. If this disease were to infect our aquarium and pond fishes, experience of its effects on salmon and trout indicate that it would set our hobby back many years.

Reference

1. "Diseases of Tropical Fishes," by Dr. H. R. Axelrod.

Book Review

All about tropical fish

by D. McInerney, published by G. Harrap & Co. at 85/-

THE third edition of this book was published in November. It has been rated as a best-seller by its publishers and has been reprinted nearly every year (in addition to the two earlier editions)—this due to stocks running out before they were expected to do. It has sold over 25,000 copies and is highly esteemed in the USA, Canada, Australia, New Zealand, etc. The author has received congratulations from countries throughout the world including some behind the Iron Curtain.

This latest edition has been brought up to date and includes most of the more popular fishes of recent introduction such as the Phantom Tetra and Emperor Tetra, etc. There are more details on breeding fishes; a new cure for white spot and prevention of Neon disease.

The book now runs to 520 pages and contains 120 colour plates and over 220 black and white photographs.

As the author proudly says: "This is an all-British book." It is locked upon in many foreign countries as the Fish Bible, an opinion shared by a large number of British aquarists.

Coleus

by D. M. C. Jones

THE coleus, which is a native of Java, is grown for the sake of its very colourful leaves. The colours of the nettle-like leaves vary enormously but the most common are red, purple or yellow with green. The flowers are uninteresting and should be removed as soon as they appear.

This is one of those plants which can be grown easily in the fish-house during the summer months but it is rather difficult to keep through the winter. It needs a well-lighted position with some direct sunshine and the atmosphere must be warm and moist.

Throughout the summer the coleus should be watered freely and fed regularly with a liquid fertiliser. During the colder months of the year, however, it must be watered sparingly and it will not need feeding.

The coleus is usually grown as an annual so that old plants are discarded in the autumn and new plants are bought in the spring. It can, however, be kept through the winter if kept in a fairly warm position. If this is done the plant should be repotted in the spring using John Innes potting compost No. 2.

It is quite easy to increase one's stock of these plants. Cuttings can be taken in the spring and they will soon form roots and grow quickly. Alternatively, seeds can be sown in the spring. The leaves of the young plants will be green at first but the brighter colours will develop as growth proceeds.

Whichever method of propagation is used, the plants will be more attractive if the tips of the growing shoots are pinched out regularly. This will cause bushy growth to develop.

Our experts' answers to tropical fish-keeping

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of the fancy being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

About a week ago I installed a tropical aquarium (without artificial aeration) in our lounge. But the fishes I placed in it have taken up a position in a top corner from which they will not move. Please tell me what is wrong?

The more usual reasons why fish will not move out of a top corner are lack of oxygen brought about by overcrowding or pollution of the water, an excess of minerals in the water (rockwork or compost dissolving out lime and so forth), infestation by parasites such as flukes, or fear brought about by the presence of a larger and potentially dangerous fish. We suggest, therefore, that you check up on the quality of the water in your aquarium, the number of fishes your tank will support without artificial aeration, the suitability of your fishes as tank mates, and the rest. In all probability, a minor change in the conditions prevailing in your tank will put things right.

Recently one of my *Vallisneria* plants produced flowers near to the crown. Is this a rare occurrence?

For a *Vallisneria* plant to produce flowers is not a rare occurrence, but the fact that the flowers your plant produced were from the crown indicated that it is a male plant, and male plants, though not exactly rare, are not exactly common.

To settle an argument can you please tell me when the butterfly fish (*Pterodon boeckii*) was first bred in captivity?

To the best of our knowledge this species was first bred by a Mr. Harold Ropes of Salem, Massachusetts, U.S.A., in 1934.

In an old aquarium magazine I have by me there is a reference to a viviparous cyprinodont called *Mollisoma formosa*. I should appreciate any information you can give me about this fish.

This livebearer is found in the wild state in southern Texas and Mexico. It attains a length of about 3 in. and is a natural hybrid between *M. aphensis* and *M. latipinna*. It resembles *M. latipinna* in outline and coloration. In some areas where this hybrid is found only females occur. Furthermore, if some females of this natural hybrid are mated back to *M. aphensis* they will produce only female offspring.

I would like to know something about a catfish called the blue chin.

The blue chin belongs to the family *Loricariidae* and is formally referred to as *Xenocara dolichopectera*. It is native to the Amazon basin and the Guianas and attains nearly 6 ins. in length. It has a sucker mouth and a snout studded with forked tentacles. In mature fish the tentacles of the male are longer than those of the female. Young fish have numerous white spots on pale blue sides; old fish are blue all over, excepting the underparts, which are white. A temperature of about 75°F (24°C) suits this species very well. Any food is taken, but algae, or a substitute for algae such as cooked spinach or cooked lettuce, should be included in the diet. *X. dolichopectera* is an inoffensive fish and may be introduced into a community tank.

What quality of water, tank furnishings, temperature and food are required for the golden rivulid?

This surface-haunting species flourishes best in a well-planted tank filled with soft, acid water maintained at a temperature in the neighbourhood of 72°F (22°C). It is not faddy about its food but shows a marked preference for worms and tiny crustaceans and insects, alive or dried.

Please tell me the scientific name of the silver shark, where it occurs in the wild, and its requirements in the aquarium.

The silver shark is known to science as *Balantiocheilus melanopectus*. It is indigenous to the fresh waters of Thailand, Borneo and Sumatra and flourishes best in captivity in soft, acid water maintained at a temperature of around 75°F (24°C). Almost any food is taken, including some tender greenstuff.

I am eager to set up an aquarium for my small son, but I have been told by a local pet shop proprietor that if I fill the tank with water from the mains the fish will soon die. Is this true?

No, most piped water in this country is suitable for fishkeeping, but if the water in your area is known to be on the hard side, then boil it up first and then leave it to stand for a week or so before emptying it into the tank. Another thing, allow all water from the mains to run from the tap for about a minute before using it for filling an aquarium. It is not good sense to use water that has stood for any length of time in a copper pipe.

My platys have folded their fins and are wagging their bodies from side to side. They have also gone off their food. Please tell me what is wrong with them.

Several things could have gone wrong with them. For one thing, an abrupt drop in the temperature of the water could bring about this condition. For another thing, the water may be polluted with an excess of decaying matter floating about or lying on the bottom. They might even be suffering from an attack of white-spot disease (are there any tiny white spots on the bodies of the fish?). The water may have become poisoned by long contact with some metal such as zinc, copper or tin. Try siphoning out most of the water from the bottom of the aquarium (stirring the compost to release collected dirt) and fill up again with fresh water heated up to the aquarium temperature.

After I switch the spotlight on, the water at the surface of my aquarium heats up about five degrees (°F) higher than the water below. Will this difference in the temperature undermine the health of the fish?

Freshwater aquarium fishes do not suffer any harm from a slight rise and fall in the temperature at the surface. It is an abrupt rise or fall in the main body of water that does harm. Some fishes in their natural state often seek the warmth of the sun during the hours of daylight.

I have been warned against introducing any metal object into my aquarium, yet my dealer has told me that strips of lead attached to the stems of plants to keep them on the compost until they root will do no harm. Is this information true?

A few strips of lead in an aquarium will do no harm to freshwater tropical aquarium fish. The highly toxic metals to guard against are brass, bronze, copper and copper alloys, and galvanised iron.

I obtained a culture of whiteworms about three months ago and placed them in a box of moist peat. Although I have not kept these worms short of food, they appear to be dwindling rather than prospering. Please may I have your comments?

Some kinds of peat are strongly acid, and very acid conditions do not appear to agree with whiteworms. We advise you to change your compost for a mixture of ordinary sifted garden soil kept open by the addition of some sharp sand, and just a small quantity of well-soaked peat to conserve the right degree of moisture.

I have an attractive variety of the moisture-loving helianthus growing in a pot in my window. If I placed cuttings of this plant in a dish of soil suspended just above water level in my tropical aquarium would it flourish at a tropical temperature?

Provided the spotlight is bright for at least nine hours every day the plant should do well at a tropical temperature, but what you must guard against is scorching of the foliage from electric light immediately overhead.

Coldwater fish-keeping answered by A. Boarder

We have made a wooden frame to hold netting to cover the garden pond. What do you think would be the best paint to use on it?

Give a coat of flat undercoat and when dry, a coat of gloss-finish paint. There are some good ones on the market which, when dry, are impervious to water.

I have had a few small goldfish for several years but recently they have gone off colour and some have died. They are kept in a tank and the only addition has been to add a new type of filter with some extra piping. The fishes lowered their dorsal fins and became mawel, and a few died. Do you think there was anything harmful about the new pipes?

If there was any copper or brass in the fresh pipes then this is almost certainly the cause of the loss of the fishes. I am repeatedly warning aquarists about the danger of copper in the water. Even a little can kill fishes, but of course a lot depends on the amount of copper in proportion to the water in the pond. Obviously in a very large pond the effect of a little copper could be negligible.

I am going away from home for a fortnight and rather than get a neighbour to feed my fish I am thinking of leaving them unfed. Do you think they will be all right until I return?

I feel quite certain that your fishes will be quite safe whilst you are away. In any normal pond with some water plants there is always something for the fishes to eat. It will be much safer to leave the fishes to their own devices rather than to let someone, who is not used to them, feed them. In most cases this proves fatal, as most people just cannot resist giving too much food, especially when they see the fishes gaping at the surface. This is probably because the water has become foul through over-feeding and so things go from bad to worse.

Could you tell me which is the best way to cure shells so that they do not lose their colour? What is the best way to mount them on cards? Which books can you recommend for recognising shells?

The shells can be painted over with clear varnish or shellac. They can be stuck on cards with a suitable adhesive and many collectors mount two shells of a kind to show different sides. There should be plenty of books available in your public library. Some are—British Mollusca, Forbes and Hanley; Manual of Conchology, G. W. Tryon; Manual of Mollusca, S. P. Woodward; Mollusca, P. Pellegrini; Life of the Mollusca, H. B. Woodward. For the live British crustaceans see—The Freshwater Life of the British Isles, John Clegg.

Further to the information given in "The Aquarist" about Prompt cement; I have written to the makers twice and can get no reply. Why is this?

It is probable that the makers only deal in wholesale to firms. The address given was on every tin I have bought. I believe there are other makes of cement which set quickly and under water like the cement named, and it may be

possible for your dealer to obtain some of this which, as far as I know, could be as good.

I find that it is almost impossible to find any of the fishes mentioned in a recent article in "The Aquarist," in any of the dealers' shops. Such fishes are—cory, chub, bream or golden perch—are obtainable. Where are they to be obtained?

It is true that one rarely sees many of the native British fishes offered for sale by the dealers. These kinds are usually caught by anglers and then handed over to aquarists or pondkeepers. It should be possible to contact a member of a local angling club who would be willing to supply you with the kinds you want, although all of the fishes named are not always found in the same kinds of water. One way to get these fishes is to net through the water plants at the shallow part of a pond or lake when many young fishes are to be caught. Be careful that you get permission first as you might be in trouble if you caught fishes from protected waters.

I have to keep changing the water of my coldwater tank as it goes cloudy. Is this necessary?

You should not have to change the water in your tank so often. This is a sign that it is not well balanced. If there are not too many fishes, there is plenty of growing plant life and the fishes are not over-fed, there is no need to ever change all the water. I had two tanks in a living room which I kept set-up for seventeen years and they were never emptied but remained perfectly healthy with the fishes. All you should have to do is to change a small quantity every week when you give the tank the weekly servicing. Siphon up the muck from the front bottom of the tank, throw out the water to removed and fill up with fresh.

Do you think it would be a good idea to cultivate water-lice and fresh water shrimps for feeding to goldfish?

I do not think that it will be worth your trouble. There are easier ways of getting a good supply of live food with less trouble. I consider white worms are the best live food to cultivate with little trouble. I was given some of them at the Harrow Aquarists Club in 1946, and I still have my stock and must have used millions from the supply since then. If you are near a river or pond where there are plenty of water lice and shrimps it is possible to catch them by dragging out bunches of weed and shaking the mass on sheets of paper.

We are having trouble with two ponds on our golf course. They have become unsightly through the presence of green slime. What can we do?

If there are no fishes or water plants in the ponds you can swirl a bag of copper sulphate crystals about in the water occasionally. The copper would be poisonous to fishes, but would kill the harmful algae.

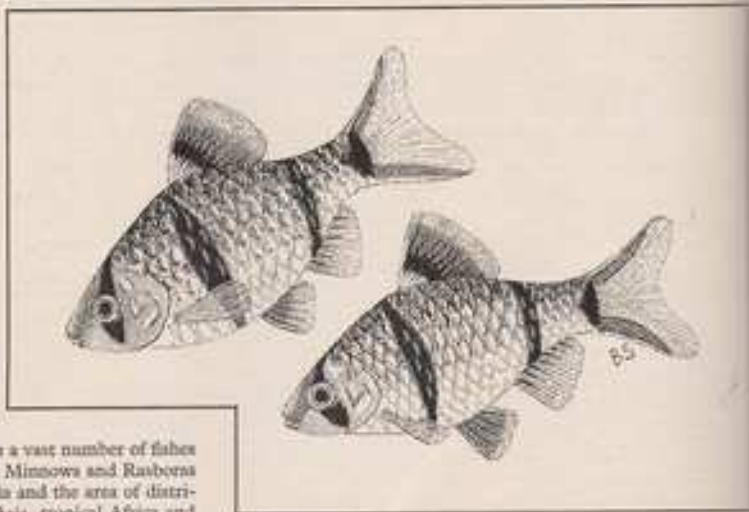
Special colour supplement for March

The March issue of the Aquarist and Pondkeeper will contain a special colour inset on the following: The green toad, Ingenious water spiders, *Nothobranchius rachovi* and The Oranda. All the articles will be illustrated in colour and accompanied by an authoritative text. **Be sure of your copy by placing an order now!**

Some colourful barbs for the enthusiast

by H. E. R. Thompson

One of the most popular of barb family is the Tiger barb—*Barbus tetrazona*



THE Cyprinidae family includes a vast number of fishes ranging in size from the tiny Minnows and Rasboras to the giant Mahaseer of India and the area of distribution covers most of South-east Asia, tropical Africa and the U.S.A. The Barbs contribute a large population to this order of fishes, but all are not of a suitable size for the average aquarium, the larger ones attaining a weight of something like a hundred pounds! Fortunately, however, many varieties do not exceed two to three inches at full growth and it is some of these smaller species that are covered in this article and which prove ideal material for the tropical enthusiast.

Most of these barbs are of a very lively disposition and often, with a few varieties, this exuberance is carried too far at the expense of other tank inmates. There are, however, exceptions to the rule and two of the more sedate members of the family are included here.

Barbs are easily cared for and are quite at home in a well set up tank of not less than 10 gallons. They do prefer soft, slightly acid water, a clean tank and a temperature of 74° to 78°F. Given these conditions our Barbs shine in their best colours and show off their lively dispositions which add gaiety to an aquarium. In my experience they do best in groups of at least four of one variety. Their appetites are enormous for their size and all foods are readily accepted, live foods always being preferred. With Tiger, Ticto and Rosy Barbs this greediness is to be watched as foods are taken with such relish and gusto that overeating is indulged, often causing discomfort afterwards and of course, more retiring species in the tank are often robbed of their rightful share of food. The golden rule of feeding little and often applies especially when catering for the barbs.

Breeding is easily accomplished with most species and

some two to three hundred offspring may be expected from a successful spawning, the young being easily raised. Altogether barbs are delightful little fish with rather high intelligence. Specimens can be trained to accept tidbits from their owners' fingers and the perkiness and naughtiness in some varieties seems to endear them all the more. Can it be wondered at, that these boisterous barbs are so popular among aquarists?

TIGER BARB (*Barbus tetrazona*)

This is, without a doubt, the most boisterous, most mischievous and probably the most popular of the genus. Sooner or later this little beauty is introduced to the community collection, usually at the expense of the firm of slower-moving fishes which come in for repeated attack by these fast moving barbs. So high spirited is the Tiger that it seems unable to restrain itself from pursuing and demoralizing more sedate tank-mates. It is possible to keep a large shoal of these fish in company with a collection of the bigger varieties such as Silver Tetras, Rainbows, Black Widows and, of course, the larger of the Barbs without trouble. The writer has a shoal of a dozen in a large tank, well planted with Cryptocorynes and with fishes

of a similar and larger size; the Tigers are so busy pursuing and playing with their own kind that other fish are left alone, but to keep a pair of Tigers in a mixed collection including slower-moving fishes with long pelvic fins, such as Angels or Gouramis, usually invites trouble. The constant nipping of fins can set up diseases and even cause death in some instances.

The Sumatra Barb, as this fish is sometimes referred to, is too handsome to be missed from a collection and therefore warrants a tank dedicated to the species alone and a shoal of a dozen or more makes a pleasing sight in a well planted tank. Their appetite is enormous and all foods are taken greedily; care must be taken not to overfeed. Usually following a feed, the Tiger adopts a head down position beneath a convenient plant or floating vegetation and I have known inexperienced aquarists to become alarmed at this thinking their newly acquired Tigers are in trouble having contracted some unknown ailment. No need for alarm for this appears to be the natural "digestive position" of this barb.

Four black bars on a glistening yellow to orange background, set off with a black dorsal fin edged with deep red, trick red ventral fins and splashes of red at the outer edges of the caudal fin describes the Tiger Barb. Pectoral and anal fins are clear with just a suspicion of a red flash at the base of the anal fin. The first black bar runs through the eye and the fourth bar is at the base of the tail; at times these bars are overcast with a metallic green lustre. A very colourful fish, especially the male. Barbels are absent. Native to Sumatra and Borneo. There are several barbed fish classified as *tetraodon*: *tetraodon parripontanensis*,

tetraodon puzosana, but in the trade *tetraodon* refers to the Tiger Barb.

Breeding this species is not too difficult and a well conditioned pair will usually reward their owner with anything from 100 to 300 youngsters. The fry, which hatch in 36 to 40 hours at a temperature of 80°F., are quite large and will take newly-hatched brine shrimp as soon as the free-swimming stage is reached. Infusoria should not be given. Growth is fairly rapid at first but plenty of room and partial changes of water are necessary if good fish are to be raised. A large tank containing 100 or more of these babies is a sight never to be forgotten.

ROSY BARB (*Barbus conchonus*)

B. conchonus is another of the lively barbs and a very beautiful one which vies with the Tiger for popularity. Typical barb shape with deep body and fairly high back which is olive green, flanks and belly silver, but a pink to red coloration suffuses the body of both sexes being more pronounced in the male especially when in breeding condition. There is a black, gold ocellated spot on the caudal peduncle and black markings on the otherwise colourless fins; black markings again more pronounced in the male. The Rosy is usually well behaved but an occasional fin-nipper.

This is another heavy feeder, accepting all foods and feeding at all levels; roots about in the gravel to find any left-overs. Easily brought into breeding condition, the



Two beautiful specimens of Rosy barbs—*Barbus conchonus*. Lively fishes they rival the Tigers in popularity.

One of the larger barbs for the aquarium the Tic-tac-toe barb—*Barbus ticto*



Rosy is a prolific fish and a large tank is essential both for spawning the breeders and raising the resultant fry. A maximum size of 6 in. is reached in natural surroundings and conditions, but aquarium specimens seldom exceed 3 in. to 3½ in. Native to India, Bengal and Assam.

TIC-TAC-TOE BARB (*Barbus ticto*)

This Barb is sometimes referred to as the Two-Spot Barb (not to be confused with the African Two-Spot Barb (*Barbus bimaculatus*) or *Barbus signis* also called the Two-Spot Barb). The Ticto is native to Ceylon and India and is one of the larger of the aquarium barbs attaining 3 in. to 3½ in. at full growth. A very lively fish but not especially aggressive. Body colour is of silver grey, darker on the back; a black spot above the pectoral fins and a larger black spot edged with gold on the caudal peduncle. All fins are a delicate green shade but a suggestion of red appears on the dorsal anal and of the male at breeding time; dorsal black towards the tip. The body of the male sometimes becomes pink-flushed when in breeding condition.

An easily kept fish which accepts all foods readily, is not

fussy as regards water requirements therefore making a good choice for the larger community. Breeding as per other Barbs, scattering adhesive eggs which hatch in 24 to 36 hours. Ample tank room must be given to fry.

CHERRY BARB (*Barbus titteya*)

One of the most beautiful of the Barbs, this little fish differs greatly from the preceding subjects in that it is much calmer and gentler in temperament; in fact, it is rather on the timid side preferring to retire into thickness of plant life rather than be to the fore as its more boisterous cousins. Without a doubt, this is one of the "quieter" Barbs and has much to recommend it to the aquarist for apart from being peaceful and beautiful, it is small, hardy and easy to breed. For popularity in the group, this one surely comes near the top of the list and is a firm favourite with the writer.

The Cherry Barb comes from the shady streams of Ceylon and has been in this country for quite some time—since around 1936. Mature specimens may grow to a size of 2 in. but this is rather the exception, the average size being 1½ in. Body is elongate. The male is par-

ticularly colourful, depending of course on moods and condition and all shades between a deep cherry red and a warm blush pink are seen at varying times. He is especially attractive at brooding time when the body takes on a sheen of sea-blood blue super-imposed on a deep cherry-red with irregular small bars on and just below the lateral line. The female is of a rusty brown shade and is quite attractive in a quieter way; a brown to black longitudinal line or band runs from the corner of the mouth through the eye to the middle of the caudal fin. This band is less pronounced in the male. Fins of the male are cherry red, those of the female yellowish brown. One pair of maxillary barbels.

These are not difficult fish to induce to spawn and an average hatching will number 150 to 200 youngsters. It is my experience with the Cherry Barb that it does not spawn out at any one time, the female preferring to drop a few eggs a day over a period of seven to ten days. This means that the youngest hatchlings will vary considerably in size to that of the oldest. Although some writers refer to this fish as an avid egg-eater, I have not found it to be so, and have raised quite heavy broods of fry with the parent fish in the breeding tank. Fry are easily raised in the customary Barb manner. Altogether, a charming little fish and an excellent subject for the smaller community.

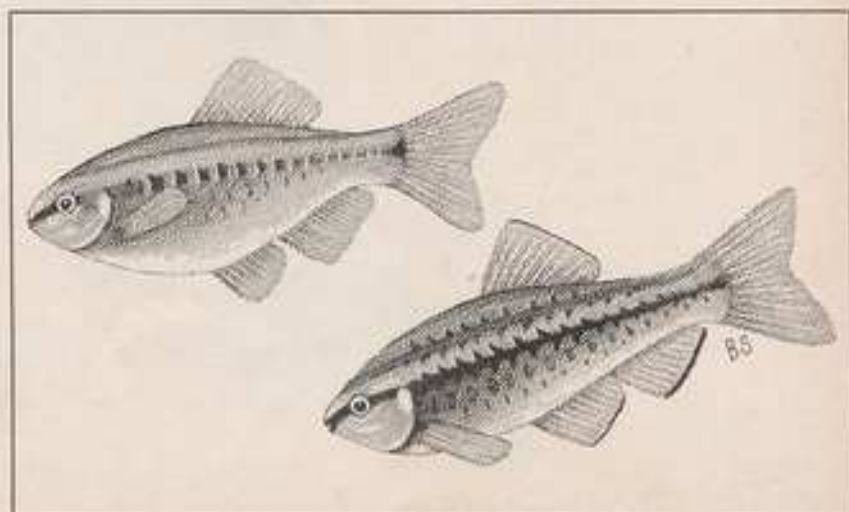
NIGGER BARB (*Barbus nigrofasciatus*)

This popular fish also comes to us from the rivers and streams of Ceylon where collectors tell us it is usually found sheltering from the equatorial sun by staying in the shade of overhanging banks. So diverse is this Barb in

colour range that several descriptive and appropriate names have been given; it is generally known in this country as the Nigger Barb, whilst on the continent it is referred to as the Purple-headed Barb; another title, and one which I consider most appropriate, is the Black Ruby, for when the male of this species is seen in all his glory this name so aptly fits his appearance. The head and front portion of the body is of a glowing ruby-red which seems to force itself through a veil of matt black which covers the hinder part of the fish. It has been said that if this species would appear at all times in its best adornment, it would without hesitation be rated as the most beautiful Barb known to the aquarist, but unfortunately this is not so and at other times we see a fish with five black bars on a yellow to orange background—indeed, the female appears in this coloration at all times; she never assumes the beautiful transfiguration of the male. Dorsal fin of the male is black, female only partly so, the upper portion being clear; all other fins of both sexes are transparent. If two or more males are kept with a female, it would appear that the males show off their most brilliant forms more frequently, one male trying to outshine his rival for the favour of the female. Barbels are absent in this species.

In temperament the Black Ruby is of a lively but peaceful disposition, its activities and boisterousness not nearly as troublesome as that of its cousin, the Tiger Barb; it can therefore, be kept with all confidence with fishes of more retiring dispositions of a similar size and being easily catered for with regard to feeding, it is a most suitable member for a community collection. An ideal temperature is 74° to 78°F. Breeding as per general Barb routine at a temperature of 78° to 80°F. Soft, slightly acid water gives best results; fry are fairly large and easily raised.

The Cherry barb—*Barbus vittata*. A beautiful barb differing in temperament to the preceding subjects being of a much more timid disposition.



HALF-BANDED BARB (*B. semifasciatus*)

I have seen this species described as (quote) "a fish which endures much and asks little—a fish without any striking beauty." Whilst I agree with the former remarks, I feel I must protest at the last statement, for I consider the Half-banded Barb to be a very handsome fish indeed. With the six broken bands of dark green (from which the name is derived) on a pale green to gold background of fairly large glistening scales, fins tinted yellow to a golden-brown shade, it is a sight to touch the heart of any enthusiast. When in breeding condition these colorations are enhanced and the male sports a faint flush overall and especially in the belly region. Quite a striking fish. To this add a very good disposition and it is not to be wondered at that the half-banded barb has been such a firm favourite for so many years.

A good pair will breed in the Barbus manner but, in my experience, not so readily spawned as some of the other Barbis. Coming from South China, a fairly wide temperature range is tolerated. All foods are readily accepted making it another desirable occupant for a mixed collection.

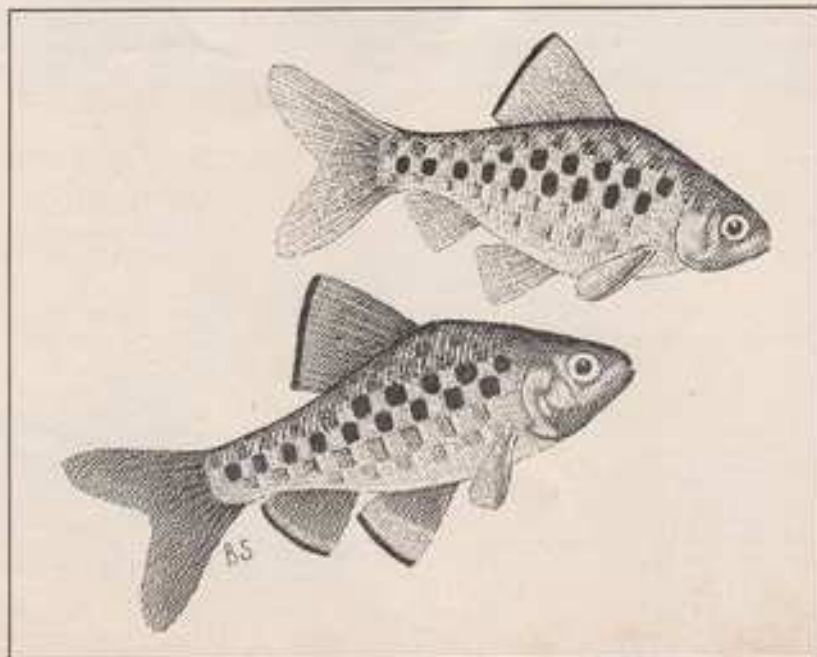
Two very small barbels are present in this species which help to distinguish it from a similar fish from West Africa, *Barbus asiaticus* which has twice as many barbels and many more bars.

CHECKERED BARB (*B. oligolepis*)

This is the second of the calmer barbbs referred to and one of the smaller varieties, good specimens not exceeding 1½" at full growth. A rather timid fish which prefers to be in groups. It is also known as the Island Barb, due to the fact that it originates from the island of Sumatra.

Sexing is easy with this species, the males being of a deep orange colour overall. Females are better described as golden-yellow. Both sexes carry a beautiful dorsal fin edged with black. A double dark longitudinal line runs from the caudal peduncle almost to the gill plates; this double line is broken alternatively giving a checkered pattern. When in breeding condition, the male becomes suffused with black while blue and green scales scintillate as the fish is caught at varying angles reflecting light. One pair of small maxillary barbels are present at the corners of the mouth.

It is not a difficult task to breed the Checkered Barb and a brood of up to 200 offspring may be expected from a sizeable breeding pair. If desired, this species may be treated as community spawners, but it is recommended that an equal number of each sex be used. Spawns at a temp. of 78° to 80° F. All foods are accepted, but care should be taken to ensure that the food is small enough for their rather tiny mouths. Altogether a pleasing little fish which makes a suitable addition to the smaller community.



Another of the timid barbbs is the Checkered barb—*Barbus oligolepis*

News from AQUARISTS' SOCIETIES

DECEMBER saw a substantial increase in club funds for Gosport and District A.S. due to their participation in the local Community Centre's Christmas Fair, where they ran a stall on a 50 per cent profit sharing basis. This has allowed the Club library to be launched, and the first half dozen books are now in circulation among members. The list of the season's table shows was held (the next starting the second meeting in March), results of which were: Class A.V.1, Mr. Ellick (Dwarf Golden Parrot); 2, Mr. Averts (Sturgeon); 3, Mr. Perman (Assessment); 4, Mr. Perman (B.H. Tetra).

THE Houndon Aquarist Society are holding their first Convention on Sunday, 27th February. The venue is Marlborough School, London Road, Isleworth, and will commence at 9 p.m. sharp and continue until approximately 10.30 p.m. Guest speaker is announced and also lecturer, Mr. Jim Kelly, who is so well-known for his interesting and informative lectures as to need no introduction to the aquatic world. His subject will be fish-keeping in the U.S.A. The entrance fee will be 2s. and all hobbyists are very cordially invited, and may be assured of a first-class evening.

In the semi-final of the A.S.L.A.S. Knowledge Competition an enjoyable evening was had at the Society's headquarters when the Chelsea Aquarists' Society were victorious. The result was a win for Houndon by 6911 points to Chelsea's 860 points. The first three places went to Houndon also, the first being Eddie Perry with a magnificent Severn, second Alec Hastings with a Red-tailed Tetra, and third Barry Abbott with a *Haplochromis* *Wagneri*. The winner thanks of the Society are due to Mr. Dave Ellis, who turned out to judge the show at very little notice when the official judge was indisposed.

AT the annual general meeting of the Pootersford & District A.S. the awards were made for the leading Aquarists of the year, these being as follows: 1, Mr. D. Cohen; 2, Mrs. B. Cohen; 3, Mr. G. Copley; 4, Mr. A. Town and three members received trophies for their success at showing in 1966.

The officials for this year: secretary, Mr. A. Town; chairman, Mr. D. Scott; vice-chairman, Mr. D. Cohen; show secretary, Mrs. B. Cohen; show secretary, Mr. H. Copley; treasurer, Mr. T. Traver; committee, Mr. M. Beckwith, Mr. P. Ludwell. The officials for the past year were thanked for their services in helping the society to a good social and financial position. Anyone interested in joining the society should write to Mr. A. Town, secretary, 49 Grafton Street, Glaslough, Co. Louth, U.K.

THE monthly report from Isthmian Aquarists Society gives the table show result which was for Labon, Killes and A.O.V. exhibitors were: Labon, 1, Keith Willett; 2, William C. Murchey; 3, Peter Dent. Killes, 1, 2 and 3, Keith Townsend. A.O.V. exhibitors: 1, Master Colin Lazarides; 2, Danny Kenner; 3, Miss Shirley L. Mather. Best Fish in Show award went to Keith Townsend.

THE Hazzymede Aquarist Society had its first full meeting on the 12th December. The meeting was very well attended and the rules and other business were dealt with so the club can get down to the hobby of fish-keeping in earnest. The meetings will be held on the second and fourth Tuesdays each month, and the Secretary is Mr. F. Cates, 1 Monmouth Road, Ashby, Leicestershire.

AT the annual general meeting of the Westonsuper-Mare Tropical Fish Club a new committee was elected as follows: Chairman, Mr. M. Locke; vice chairman, Mr. D. Fleming;

treasurer, Mr. D. Latty; secretary, Mr. B. Dale; Com. member, Mr. D. Reed; Junior committee member, Mr. R. Hayes; show secretary, Mr. J. Soutz. Meetings are held on the 4th Monday of the month at 9 p.m. at the Victoria Bowling Club and prospective members and visitors are warmly welcomed. Interested persons should contact the secretary, Mr. R. A. Dale, 18 Litton, Dunster, Clevedon, Weston-super-Mare.

THE second "leg" of the home furnished aquatic competition of the Newport A.S. attracted an entry of sixfish tanks, and these were judged by F.R.A.S. judge Mr. Peter Burtles together with Newport show secretary Mr. Michael Parry and society member Mr. Philip Tudor.

At the Society's December meeting held at the usual venue, the R.A.G.B. Club, Harold Wood, Slow Hill, Newport, the main item on the agenda was a slide show on aquatic plants held from Bazzwood Aquarists Limited, Dares. The presentation was by Mr. Terry Wall, the script being read by Mr. Terry Phillips. The show secretary also gave a brief summary of the previous month's meeting which was made by the winners at Mr. Les Buxton's (tanks up to and including 2 ft. in length) and Mr. Jim Wall (tanks over 2 ft. in length). Presentation of two trophies awarded for competition at the previous month's meeting were made by the chairman, Mr. Jack Burgess, to Mrs. Molly Burgess (best exhibitor in table show) and Mr. Terry Wall (best exhibitor in table show). Anyone desiring to join the society (meeting first Tuesday of each month commencing 8 p.m.) were asked to communicate with Mr. L.G. Phillips, 34 Broadway, Coventry, St. Julian's, Newport, Mon. who will be pleased to forward further details.

A HIGHLY successful Social was held by the Lebridge and District A.S. to round off the year's activities, and Mr. Tappin proved himself a very good Master of Ceremonies. The last evening of 1966 consisted of an illustrated talk on egg-laying Tooth Carps given by Mr. Bull. These splendid fish were seen at their best on the colour slides. 1967 was heralded in with a talk by Mr. Baker on judging—a very educative evening. Members were told of the system for awarding points, what a judge looks for, and he also advised members to put only good specimens on the Show Bench. A full programme for 1967 has been planned. Table shows will be held, also a number of talks will be given.

It is with regret that the Club learned of the death of one of its members, the Secretary's mother, Mrs. Bull. Mrs. Bull had been an active member for some years and the Society's sympathy goes to her relatives and friends.

THE Annual General Meeting of the Lanarkshire A.S. was held recently and was well attended. The Officers for the coming year were elected as follows: President, S. Nairn; Vice-President, G. Burns; Vice-President, A. Watt; Secretary, E. Wynn; Treasurer, A. Anderson; Show Manager, S. Marshall; H. Christie, Social Secretary; J. Smith, Committee; A. Hagg, O. Hagg, R. Hagg, B. Hagg, H. Hagg, R. Wood, P. Haggarty, T. Haggarty, T. Hill, A. Anderson, J. McDonald, T. Campbell. F.R.A.S. Delegates: P. Haggarty, Breeding Committee Delegates: S. Nairn, P. Haggarty.

The L.A.S. Open Show which is being held in the Community Centre, Airdrie on the 14th May, 1967, will be the Show with a difference, as it is intended to have separate classes for the following—Breeder's: Guppies, Mollies, Platies, Swordtails, A.O.V. Exhibitors: Characins, Barbies, Danios, F.L. Tooth Carps, Silver-cides, Fighters, Goldis, Tricostatus, Large Goldfish, Dwarf Cichlids, A.O.V. Egglayers.

This has become necessary due to the amount and great variety of fish being fed by the Club Members.

The Society holds its meetings on the first Friday of every month. Visitors are assured of a very warm welcome. Further details can be obtained from the Secretary, Mr. E. Watson, 8 Westmoreland Street, Glasgow, S.2.

THERE were forty members in attendance at the January meeting of the Alreborough A.S., when it was announced that the Monthly Bulletin issued by the Society has been awarded position No. 6 in the International Top Ten Society Bulletin Competition, and a Certificate in the effect has been received from the organisers of the competition.

The programme for the evening included a lecture by Mr. Seteman on "Fish Diseases", one by Mr. Whitley on "Tank Construction", and one by Mr. Lamm on "Propagation of Tropical Plants". These lectures were very interesting and enjoyed by the members. The Society has received interesting tape recordings from American Aquarist Society concerning their club procedures, and these were played for the Alreborough members' entertainment. The Society also received a box of stamps, supplied by Sgt. R. S. Holmes, now serving in Cyprus, and these were sold to members, the proceeds being put towards the Society Fund.

The monthly awards were presented to the following—Specified Juniors: 1, K. Litter; 2 and 3, P. Kirby. Specified Novice: 1, Mr. I. Whitley; 2 and 3, Mrs. D. Burgess. Specified: 1 and 2, Mr. J. Whitley; 3, Mr. B. Lancaster. A.O.V.: 1, Mr. P. Joyce; 2 and 3, Mr. C. J. Burrow. The award for the Best Fish in the Show went to Mr. J. Whitley.

THE December Meeting of the Dundee A.S. featured the Table shows for Scott Trophy—Swordtails and Scott Trophy—Egg-laying Tooth Carps.

The results were: Scott Trophy—Swordtails: 1, J. McGeachie; 2, G. Reid; 3, D. Ferris; 4, W. Cairns. Egg-laying Tooth Carps: 1, J. McGeachie; 2 and 3, R. Brown, 4, B. Hill (joint). Trophy—Swordtails: 1 and 2, David Peirce X. Avari (joint); 3, G. Kirkcaldy X. Avari (joint); 4, Stewart Gould X. Avari (joint). Egg-laying Tooth Carps: 1 and 2, Stewart Gould; 3 and 4, David Peirce.

THE Hocknall and Bullwell A.S. was formed in October with thirteen members. The committee elected is Mr. T. Peery, Chairman; Mr. K. Whitaker, Treasurer; and Mr. T. Harrington, Secretary. Guest members: Mr. R. Kirk and Mr. A. Bennett. Meetings are held once a fortnight at the Red Lion Inn, High Street, Hocknall on Wednesdays. At the fourth meeting held in December membership had risen to sixteen members and a warm welcome awaits anyone interested in fishkeeping. Further details are obtainable from the Secretary, Mr. M. T. Harrington, 3 Greenwood Vale, Hocknall, Norm.

THE quarterly Newsletter of the Association of Yorkshire A.S. includes notice of the Secretary's change of address, the new secretary being Mr. F. S. Harris, The White House, Upper Poppleton, York. It is the aim of the Association to achieve 100 membership of Yorkshire Societies. The current membership is 34. The annual show will be held on the 29th April under the sponsorship of the Hull A.S. at the Railway Gardens, Anlaby Road, Hull. The next meeting will be held on the 12th February at the Church Institute, Alton Place, Leeds.

THE Hendon and District A.S. would like to thank all those aquarists who attended the Convention, for without their support the show could not go on, and would also like to apologise for the absence of Dr. Baillina and hope that fellow aquarists were not too disappointed. The Society would like to thank also all those aquarists and societies who wrote afterwards, saying that they enjoyed the programme.

The annual general meeting has been held recently, the new Chairman is Mr. Henry White, and the new Secretary is Mr. Keith Parkin, 7 Helms Way, Stanmore, Middx.

THE social event in December was one of the best events of Merseyside A.S. for 1966 and took the form of a Christmas Dinner for 45 members, their wives and friends at a Liverpool Restaurant. The last meeting of the Old Year was a feature by the chairman Mr. Fred Mills on his favourite fishes—the Labrids.

The Society would like to offer a challenge during 1967. The treasurer, Mr. Ken Parkin, has gained 14 "Best in Show" awards in F.N.A.S. affiliated Society Open Shows which have been won with two fish, a Tin-Foil Barb, and a Yellow Fin Barb. Can anyone match this record? The first Open Show is scheduled for 14th May at Merseyside Athletic and Social Club, 3 Richmond Terrace, Liverpool 6. The second Open Show is a three-day event to be held at Warriston Playground, Liverpool 11, during the three days of the Liverpool Show 13-14-15th July.

THE Clapham A.S. held their annual general meeting and a new committee was formed: Chairman: Mr. A. Kemp; Secretary: Mr. A. D. Dornier, 111 Hopson Road, Stratford Common S.W.18; Treasurer: Mrs. M. J. Dunbow; Show Secretary: Mr. A. G. Hartman; Committee: E. J. Bell, J. Rankin, C. Pittman, L. Gossier and Master B. Dunbow. A new office was formed, that of a P.E.O. and this task fell to Mr. P. G. Glynn, 64 Boscawen Road, Tooting, S.W.17, Telephone 841 0445.

The aim of the new committee was for more and better entertainment for its members at the club meetings which take place every second Tuesday in the month. Films and lectures have already been arranged. There will also be a Table Show for the Junior Group which is growing in number. There will be more inter-club Shows.

RECENT results received from the South London Section of the Fancy Guppy Association were as follows: Long Dorsal Vail: 1, W. Collier; 2 and 3, A. Fleming. Short Dorsal Vail: 1 and 2, Dr. Atkins; 3, Goodall and Montilla. Delta: 1, Bevilong and Jenkins; 2, Goodall and Montilla; 3, J. Goodall. Fan: 1, Goodall and Montilla; 2, J. Hibbert. Flag: 1, J. Thorne; 2 and 3, D. Debono. French: 1 and 2, L. Mason; 3, J. Thorne. A.O.V. Males: 1, Protheroe and Turner; Colours: 1, R. George; 2 and 3, Mrs. Thorne. Colour Class: 1 and 2, Goodall and Montilla; 3, Protheroe and Turner. Spangles: 1, Miss G. Thorne; 2, Goodall and Montilla; 3, R. Vavley. Wedge: 1, Mrs. Thorne; 2, Goodall and Montilla; 3, Mrs. Hibbert. Original: 1, Dr. Atkins. A.O.V. Females: 1, Protheroe and Turner. Breeder's Pair: 1, Dr. Atkins; 2, Goodall and Montilla; 3, R. George. Breeder's Female: 1, Protheroe and Turner. Breeder's Male: 1, Protheroe and Turner; 2, Dr. Atkins; 3, Goodall and Montilla.

AT the December meeting of the Chislehurst and District A.S. held at Larkwood Primary School, New Road, E.S., the table show resulted as follows: Conch: 1, Mr. T. Sumner (Pterodrella gracilis); 2, Mr. W. Chambers (Synalocis sp.); 3, Mr. W. Dean (Alloea chloris); 4, Mr. Bourne (Corydalis palomus). Characin: 1, Mr. T. Sumner (Salmostes discus); 2, Mr. T. Sumner (Salmostes discus); 3, Mr. H. Hunter (Bassett's Java Zebra); 4, Mr. W. Chambers (Ratanus).

THE annual general meeting of the Thurrock Aquarist Club was held in December and the following officials were elected for the current year. Chairman: Mr. R. Barber; Secretary: Mr. S. W. Handie; Treasurer: Mrs. B. M. Nicholls; Show Secretary: Mr. D. Durrant; Publicity Officer: Mr. E. Appleby; Librarian: Mr. P. Hookley; F.R.A.S. Representative: Mr. E. Nicoll; Competition: Mr. G. Parkin; Mr. P. O'Brien. Club Records: Mr. G. Rowe. Club members would like to thank all retiring officers, with a special thanks to Mr. R. Nicholls (retiring Chairman) and Mr. P. Sowells (retiring Secretary) who have both showed tremendous interest and enthusiasm as officers of the Club

for the past nine and four years respectively. They both stated with regret that owing to increasing personal commitments they were unable to stand for re-election.

The Club recorded a most successful year which included two club shows, three inter-club shows with Southend and Leigh A.S. and Basildon and District A.S. plus several informative talks and table shows. The Annual Awards were presented to the following: "Home Aquaria Cup" 1, Mr. K. Appleby; 2, Mr. S. Handie; 3, Mr. A. Sridulwick. "Woburny Khalid" (Highest accumulated points in table shows throughout year): 1, Mr. B. Barber; 2, Mr. G. Rowe; 3, Mr. R. Handie; 3, Mr. P. Hookley. "Member of the Year": 1, Mr. D. Durrant; 2, Mr. L. Smith; 3, Mr. R. Nicholls; 3, Mr. E. Nicoll. "Holland Cup" (Maximum accumulated points gained in Open Shows): 1, Mr. R. Barber; 2, Mr. D. Durrant; 3, Mr. S. Handie; 3, Mr. E. Nicoll. Special award "Best Fish of the Year" Cup: Mr. G. Rowe. New members and visitors to the meetings are always welcome, and information can be obtained from the Secretary, Mr. S. W. Handie, 47 Dalwood Lane, South Ockendon, Essex.

AT the annual general meeting of Bath A.S. the following officers were elected to serve for the year 1967. President: Mr. L. Emery; Vice-President: Miss K. Harper, J.P. and Mr. D. Pascoe; Chairman: Mr. T. Calver; Vice-Chairman: Mr. F. Gregory; Treasurer: Mr. E. Short; Secretary: Mr. B. Fenby; Committee: the above names and Mr. P. Butler, Mr. J. Smith, Mr. D. Lovgren. The Treasurer reported that the club was financially sound and that both the Secretary and Chairman for the past year praised the work of all who made it the success it was. "World societies and anyone who wishes to contact the club please note the change of Secretary who is now Mr. R. H. Pevins, 1 Oak Avenue, Englestone Park, Bath.

THE Worthing Tropical Fish Club held its annual general meeting recently and the following members were elected as officers: Chairman: Mr. A. Eney; Secretary: Mr. F. C. Waring; Treasurer: Miss N. Scott; Committee: Mr. W. English, Mr. E. Cook, Mr. D. Deakin and Miss T. Oprea. The club is to change its meeting place to the Royal George Inn, Market Street, Worthing, where it is hoped the surroundings will create a more informal atmosphere. The meetings will still be held on the third Thursday of every month. Would-be members are invited to write to the Secretary, Mr. F. Waring, 1 King's Court, Apley Road, Worthing.

THE Cardiff A.S. announce a change of committee, the new members being Messrs. Barnes, Gwynell, Alcorn, Lloyd, Barnett and Mrs. Dunstan. The December meeting was devoted to a quiz, which was enjoyed by all, the winner being Mr. Barnes who received a book as a prize.

Anyone wishing to join the society can be assured of a warm welcome and this also applies to all visitors. Meetings are held every second and fourth Thursday of each month at the "Old Arcade" Inn, Church Street, Cardiff. Further information can be obtained from the Secretary, Mr. Alcorn, 55, Herl Ty Gwyn, Llanberis.

AMONG recent activities and lectures held by the Portsmouth A.S. was a table show for Shubunkins, Goldfish and plants. The results were as follows: Shubunkins: 1, 2, 3 and 4, Mr. W. Howe. Goldfish class: 1, 2 and 4, Mr. V. Hunt; 3, Mr. H. Henson. Plant class: 1, 2, 3 and 4, Mr. R. Wylie. The judge was Mr. J. Stridwell. While the fish were being judged, Mr. W. Howe gave a very interesting talk on selecting fish for breeding, hand spawning, and culling of young fish. A table show for breeder's classes was judged by Mr. J. Stridwell, and he congratulated members on the fine quality of the entries. The results were: Tropical flagfishes: 1 and 4, Mr. H. Hooper; 2 and 3, Mr. G. Lawrence. Lovebearers: 1, Mr. H. Hooper. Goldfish: 1, Mr. R. Wylie. During the judging of these fish several members spoke of their experiences in fish breeding.

The Home Furnished Aquaria competition resulted as follows: Goldfish class: 1, Miss W. G. Ryder; 2, Mr. W. T. Ryder; 3 and 4, Mr. V. Hunt. Tropical class: 1, Mr. J. Stridwell; 2, Mr. M. Mason; 3, Mr. and Mrs. J. Howard; 4, Mr. G. Marks. Other activities included an illustrated lecture on Aquarist Plants given by Mr. M. Mason.

AT the annual general meeting of the Cheltenham and District A.S. the following officers were elected: Chairman: Mr. B. R. James, vice chairman: Mr. D. Andrews; secretary: Mr. V. Jones; treasurer: Mr. A. Buxton; committee members: Mr. G. Buxton, Miss S. Jones, Mr. N. Bonding, Mr. R. Doolman, Mr. N. Hughes. A warm tribute was paid to the retiring chairman Mr. R. Heydon. Owing to business commitments Mr. Heydon did not seek re-election, but all members were pleased to hear that he would be able to attend the meetings which are held on the second and fourth Wednesday evenings in each month at the Christ Church Hall, Malvern Road, Cheltenham, Glos. at 8 p.m.

New members will be made very welcome and further information may be obtained from the Secretary Mr. Vic Howe, 19, Dinan Road, Cheltenham.

THE following officers were elected recently to serve the Wakefield and District A.S. during 1967. Chairman: Mr. A. Cotton; vice chairman: Mr. J. Garrick; show secretary: Mr. J. Gower; Committee: Mr. D. Newman and Mr. O. Boulter; secretary: Mr. C. Archer, 8, Lindey Mount, Averthorpe, Wakefield. Treasurer: Mr. A. Bates. Future meetings will be held at the Central Youth Promina, Zealand Street, Wakefield, on the second Tuesday in each month at 7.45 p.m.

NEW SOCIETIES

A new Society was recently formed in the Walsby area under the title of the South Park Aquatic Study Society. The first meeting was held on 2nd January. During this meeting the following officers were elected: Chairman: Mr. R. E. Dudley; Secretary: Mr. D. G. Crisp, 185 The Broadway, Walsby, Leicestershire; Treasurer: Mrs. M. Dudley. Also within the Society, a part of Librarian: Mr. C. South was elected. The Librarian will collect all published literature available and records of studies made within the Society.

The objects of the Society are to study all forms of aquatic life; e.g. fish, amphibians, plants and microscopic organisms, Hares, performing a more technical understanding within this field of subjects.

A NEW society has been formed at Gainsborough and is called the Cleveland Aquarist Society, which covers Saltburn, Great Ayton, Skelton, Loftus, etc. The first meeting was held on the 1st November and meetings are held fortnightly on a Tuesday at 7.30 p.m. in the lounge of the Black Swan, Westgate, Gainsborough, N. Yorks. New members would be welcome and the Secretary is Mr. A. Trotter, Beck House, Fountain Street, Gainsborough.

SECRETARY CHANGES

Belle Vue (Manchester) A.S.: Mr. P. Preston, 14 Hollow End Towers, Birmingham, Stockport, Cheshire. Mansfield and District A.S.: Mr. G. Young, 47 Overfields, Kearsford, Cheshire.

AQUARISTS' CALENDAR

25th February: Hounslow A.S. Convention 5.00 p.m. at Marlborough School, London Road, Isleworth. Speaker: Jim Kelly on Fish-keeping in the U.S.A. Admission 2s. 6d. Everybody welcome.
12th March: Haddenfield Tropical Fish Society. Fourth Open Show.
7th May: Leigh A.S. Open Show, Leigh Rugby Union Club.
10th-12th August: Portsmouth A.S. Open Show.
10th September: Haddenfield Tropical Fish Society. Fifth Open Show. Secretary: Mr. L. Kaye, 6 Totter, Haddenfield.

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