

# The AQUARIST AND PONDKEEPER

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## Editorial

MENTION poor attendances at society meetings to a keen club secretary and he will, as likely as not, place the blame with some dark reference, such as to the lure of the "idiot's lantern." The ghostly blue emanation which now mesmerises nightly a considerable proportion of our population is probably responsible for a great deal of absenteeism from meetings, especially in the winter, but television is not the only cause. Nor, we suspect, is television to blame for the remarkable happenings reported in a Newcastle paper under the heading "Television Menace to Tropical Fish" a few weeks ago. This report described the trials and tribulations of a man with an aquarium and a television set. He complained that after he had installed a new television set by the side of his long-established aquarium he had noticed that the water plants at the end of the tank nearest to the set began to look sickly. When he moved the set to the other end of his aquarium the plants there showed the same trouble. Radiation from the set appeared to be under suspicion; it was not recorded whether the man subsequently cased the television set in lead sheet or his aquarium. Perhaps he started to attend his society meetings instead.

A Happy Christmas  
to all our Readers  
from the Editor and Staff

# A Bisexual Platy?

by P. A. O'CONNOR

THE following account has mainly been extracted from a log kept upon the fish and the thoughts and events that followed. While feeding my fish on 29th December, 1958, I glanced at tank T243. In this tank were perfect specimens of the rare blue platy. One catching my attention was "heavily in young"; I looked closer and I was staggered to find it was the male. My first reaction was one of annoyance, as it was the only male I had; the others were inferior and had been destroyed.

Later I thought of the example of the cockerel, which can give all the appearances of a cockerel but also lay eggs; it is in fact a hen.

If my platy was such an example how were other blue platy females in young? One other female was certainly in young and my male was the only one present. Previous history of the tank was as follows.

11th December. Virgin females, seven in number, were moved from tank T241 (females only) to tank T243, which also contained young thick-lipped gourami. Tank 241 was also inspected but nothing unusual was to be seen.

12th December. The male was introduced to tank T243 from tank T361 (male tank). Water temperature was 75 to 80° F.

Most livebearer enthusiasts know that a female can reproduce from an earlier mating. In this case I had no male to start with, buying females in young, and it had been well over 5 months since the appearance of any youngsters. This ruled out earlier contact for the virgin female.

It looked now as if I may have a genuine bisexual fish. The greatest danger I could see was if the male discharged its young it may very well appear just a normal male and a valuable discovery would be ridiculed. There have been known cases of female fish changing to a male in the same manner as the hen-cockerel example. Was it possible that in the period of the change-over the two sexes could overlap?

30th December. I examined the fish and found two young in tank T243. They were a Tuxedo swordtail cross and appeared to be from the "male."

What bothered me was the number of young born to the bisexual. The majority could have been eaten and probably were, although the bisexual had not lost its "gravid spot" and was still fairly bulbous, suggesting two things; either the "spot" meant nothing or it still had young inside.

During later months the "spot" waxed and waned as in a normal female and the diet had nothing to do with this. It could have had further young, but owing to lack of space I had it with gouramies, so I found none.

11th January, 1959. Photographs were taken of the fish. Two clearly showed at this late date the male gonopodium and the "gravid spot" and thirdly, a far more important factor, the female-like curve on the underside. Fourteen days later another batch of photographs were taken and showed this curve to have gone.

Later in my inquiries I heard of many cases of changes of female to male in red swords, red wagtails, black mollies and platy *variatus* and one or two cases possibly similar to mine. Although my informants had noticed the fish they did not investigate the matter as they are commercial breeders.

Although I do not consider the evidence 100 per cent foolproof, the scales fall heavy on the bisexual nature of



Blue platy showing gravid spot and female curvature of ventral surface together with gonopodium. Photographed 11 days after producing young



In this photograph, taken 25 days after production of young by the fish, although the gravid spot can be seen the female curvature of the ventral surface is not shown

the fish. The male was the only fish in contact with Tuxedo swords; it looked as if it was to have young and young appeared. It had full use of its gonopodium and all virgin fish with it later had young.

## Breeding the Blue Acara (*Aequidens latifrons*)

by E. WALLWORK



Blue acara at 10 days of age, about three times natural size

**T**HIS fish is one of those that you rarely see in the average dealer's tanks, at least in the adult state. Like myself you have no doubt admired it in a friend's tank or in a public aquarium and, because of its average adult size (about 5½ in.), you have thought that it is not for you; and the smaller acaras offered for sale do not have the full spangled colour of the adult. But if you obtain a few young acaras you will find them easy to grow on to adult size in an average community tank on condition that you have no baby fishes in the tank that the acaras could eat. The pair whose breeding procedure is reported below were comparatively well behaved in a 3 ft. community tank and though they did eat one or two baby guppies they did not attack the adults nor even a neon tetra until they reached 2½ in. in length, when they were removed to another tank.

### Bright-green Spangles

The name blue acara seems a little misleading as, in common with other cichlids, they have a number of colour phases and appear different in various lights. In the adults, the bright-green spangles around the mouth and gill plates make them most attractive, especially with front lighting. Both sexes look alike until 2½ to 3 in. long, and even at sexual maturity fullness of the female seems to be the only true indication of sex. After this size, sexual by-play in the tank will usually tell you which are the males and females, but as the fish progress to their mature state, it is apparent that the fins of the males are a little longer than the females and the crests of the dorsal and anal fins drawn out into a thin filament which reaches as far as, and sometimes beyond, the end of the tail. The body of the male is also more laterally compressed than that of his partner, and he is generally more aggressive. Colour is no indication of sex, as the female, if ready to spawn, will often maintain a more constant colour than the male. The ten or so vertical dark bars on both fish are of very variable intensity, according to the moods. *Aequidens latifrons* is the name by which this fish has been generally known and this makes reference to its flattened forehead. In keeping with the general appeal of the adult fish, it is often known in other countries as *A. pulcher* (which means pretty).

Feeding these fish presented no problem as they had the same food as the other fishes, mainly white worm, *Daphnia*, *Tubifex* and occasionally some of the cat's tinned food. They will occasionally eat dried food, too, especially if it is of animal origin. Separation of the sexes does not seem to be necessary, but I usually resort to this for a few days as it is a stimulus to both fish and, as "absence makes the heart grow fonder," they will probably breed true to pattern as soon as you have prepared the tank for them.

Plants are bitten off at the stems as breeding time approaches and it was because of the fact that my best *Vallisneria* and *Cabomba* were floating at the top that I removed the four fish from the community tank. Two of them had developed an affinity for each other and a small breeding tube had appeared as a little grey nodule in front of each of their respective anal fins. The small nodule was lightly pigmented with darker spots and appeared to be the first ray of the anal fin. This was the pair that was segregated for 4 days whilst the spawning tank was prepared. As it is inherent in the parent fish to suspect that potential enemies are lurking behind any plants, none was needed; the spawning pair would have pulled them out anyway. It could be reasonably supposed that the acara

has a highly developed sense of parental responsibility or intelligence, and, as will be seen, they are, in fact, excellent parents. The male was 4 in. long and the female 3 in. long in the pair selected.

As the broods of the cichlids are usually large, the tank which was set up was 27 in. by 12 in. by 12 in., although only 8 in. of matured water was added. By matured water nothing special is indicated, just water from an established aquarium, in this case from the community tank. From the garden, some flattened sandstone and Portland stones were used to make a cave (about 6 in. cube) at one end of the tank, and three flat rocks were pressed into the gravel over the remainder of the tank.

### Stone Polishing

Temperature of the water averaged 80°F. on introduction of the breeding pair, who immediately took it in turns to chase one another around the tank. Next day it appeared that the female, although her fins were a little torn, could still put up quite a fight, and knew at which strategic time to dash into the cave into a little recess which seemed to be made for her alone—as indeed it was. The male in the meantime had started to polish the flattened stone with his mouth and the female helped from time to time. Small elevations on the edges were bitten right off by the female and I felt sure that spawning would not be long delayed, but this behaviour went on for 4 days without anything to show for it, except that the female's fins seemed to be a little more ragged with one or two tears.

The water was then becoming a little cloudy, as neither fish seemed interested in the small amount of live foods which had been placed in the tank and, as it lacked the rectifying action of any plants, a corner filter was placed in the tank. This did an admirable job of work, in spite of the fact that the parent fishes took occasional bites at it at first. As the female spent quite a lot of time in the cave and chased the male away, I placed a sheet of glass in front of the cave and separated the pair. Almost immediately each fish swam up and down its side of the glass, "kissing" one another through it. Separately fed on live food, there they were left for 2 days, during which time they never left the glass face for more than a few seconds. When the glass screen was removed, both fishes had settled their differences and were the best of friends, kissing and nudging one another. That same evening, they had locked their jaws together and were pulling and twisting each other, as in a tug-o'-war.

Next day the female had retired to the cave and would not let the male come near, so he continued to wander around the tank occasionally polishing a piece of rock from time to time. In the evening both fish were in the cave as it became dark. On the following day he was once again outside, with a difference. With a long-focus magnifying lens and a strong light I could just make out rows of eggs, rather large ones, each about 1 millimetre in diameter and of hyaline appearance, on the vertical face of the inner wall of the cave. The female was fanning the eggs with her pectoral fins in a regular manner, going up and down the rows; at the same time she kept a watchful eye on the male to prevent his entry.

Incubation of the eggs could be seen only with difficulty, as it took place 8 in. from the front face of the tank. Three

(Please turn to page 124)

# Aquarium with an "Aim"

by L. R. BRIGHTWELL

IN 1871 when the Brighton Aquarium burst upon the world as the most ambitious effort of this sort on our side of the Atlantic, Sir Richard Owen stated that nothing could be of greater educational value than a well-organised Aquarium. For its first 20 years or more Brighton not only showed a big series of museum exhibits but also microscopes which carried slides changed weekly by the Brighton Natural History Society. To-day, the public aquariums of our islands grow apace, yet how many of them even attempt to live up to the ideal set by the great anatomist?

Scotland leads the way with Millport: not only a great aquarium and research station, to it is attached a most sumptuous museum. South of the border the tale is not too happy. There is Plymouth, which, as head of the Marine Biological Association, has an adequate, if slender, guide book, and Cullercoats has now a specially designed series of educational tanks. Bexhill-on-Sea has an excellent museum of local marine life, but all efforts to accompany it with an aquarium have been frustrated by alleged lack of means. As already stated in *The Aquarist*, small aquariums have broken out along the South Coast like a sort of rash, but many of them are "catch-penny" shows for the "season" only. One of these has added the "attraction" of monkeys, and it has been closed—with ignominy—and been most deservedly sold up.

One of the many small privately owned aquariums of the West Country has honestly striven to live up to Sir Richard Owen's dictum of the great Victorian age. This aquarium is Teignmouth's. It was brought into being in the face of much original opposition, by Mr. Leslie Jackman, who only a few years ago opened, again only after disheartening struggle, an excellent little aquarium at Paignton.

Mr. Jackman will be well known to all West Country

radio enthusiasts, as a deservedly popular broadcaster and recognised authority on sea-shore life. The Teignmouth Aquarium's purpose is to both delight the eye and feed the intellect with living exhibits, being seen side by side with well-executed models and explanatory drawings. Even the notepaper employed has for its sign-manual the figure of a larval shore crab. Of course, this is Greek to some—to which the only possible reply must be, let it be. There are others. The proprietor of one of the many less successful aquariums lately assured me that people came to an aquarium only to be amused. They did not want "models and things," but just to see "fishes swimming up and down." This is the type of mind that encourages monkeys and parrots—as a preliminary to deserved bankruptcy. Philip Henry Gosse's now world-famous pioneer effort was not only to make people interested in marine life, but to make them like being interested.

Bexhill apart, very few coastal museums take any interest at all in sea-shore life. Falmouth Museum, not so many years ago, actually came under the hammer! One can scarcely imagine a more ignominious end to a professedly educational establishment.

In very different case is the beautifully designed Museum of Truro. Truro has devoted the whole of the Museum's spaciouly designed gallery to the County's natural history—with one large case containing mementoes of the county's famous naturalist, Jonathan Couch.

At the moment space does not allow a series of local fishes, a bulky business under most favourable circumstances, but there is a complete collection of local shells—they number many hundreds of species, and a representative display of local crustaceans, molluscs and echinoderms. Worms, coelenterates and other groups will be added as space permits. Recently a series of scale models of local



Only the diorama can show aspects of marine life that aquarium and camera alike are unable to portray. This sketch was made for a model designed for Truro Museum and shows some of the largest of British sea weeds

whales and turtles has appeared. The chief trouble of educationalists seems to be, not to find the specimens, but the right people to deal with them. Truro has luckily some very enthusiastic volunteer workers. Just 3 years ago, and just before my arrival as a resident, a 70 feet porpoise was washed ashore only 5 miles from where I now live. Not even the car bones (each large as a man's head) were salvaged, or even a strip of whale bone. Locals can remember only one thing about this bit of beaching—the smell!

Radio and television are fast doing much to make people alive to the wonders of marine life, but much more must

still be done by the Aquarium. And its natural-history interest should be indispensably accompanied by the museum. But really to get either across to that mass of diverse humans, lumped together as the public, needs careful handling. Academic learning is for the most part completely helpless to attain the desired end. It needs showmanship—of a very special kind. Even the best teaching needs to be "put across."

Ah well! As a very famous west countryman—the workshy, but still lovable Richard Varwell, in Eden Philpot's *Yellow Sands*—observed: "You can't please everybody . . . and only a fool tries!"

## BOOK REVIEWS

*Your Book of Aquaria* by Anthony Evans. Faber & Faber Ltd. 9s. 6d.

THIS new title in the well-known "Your Book" series is essentially for the younger reader and it should prove a welcome addition to school libraries, where it is likely to be in some demand. All children like animals and a stimulating, inexpensive and convenient way of satisfying their interest is to allow them to keep an aquarium. In matters aquatic there are many teachers who just do not know all the answers and this book will therefore meet a long-felt want. The scope of the text is wide and the young aquarist will be able to extend his or her knowledge of the hobby considerably without having recourse to "grown-ups." Chapter by chapter the reader is taken in simple language through the mysteries of fishes and their needs, all about aquaria and their construction and suitability, making the tank ready, furnishing, plants you can collect yourself, tropical fishes and plants, fishes you can catch yourself, goldfish, feeding, keeping the aquarium clean, collecting pond animals, jars as aquaria, sea-water aquaria, breeding fishes in aquaria and last, but not least, things which may go wrong. There is an attractive coloured jacket, five photographs, 26 diagrams and sketches and 29 drawings of fishes. The author, who is editor of *The Aquarist*, has four children of his own and has experienced the misconceptions which children have on matters aquatic. My own personal interest in the hobby started some 40-odd years ago at the age of nine. In those days one learned through trial and error and the errors were many. How much easier things would have been with such a book as this. I handed this book to one of my own boys at school and asked him to let me have it back the next day. Asked his opinion, he replied, "Smashing, Sir!", which, in the monosyllabic vernacular of to-day, is praise indeed.

RAYMOND YATES.

*Electricity in Your Aquarium* by L. Warburton. Percival Marshall & Co. Ltd., London, W.1. 7s. 6d.

THIS must surely be the very first book for the hobbyist which makes practically no reference to fish. Instead it confines itself, as the title implies, to a very wide survey of the use and mis-use of electricity as it affects the aquarist. For many years Mr. L. Warburton has been engaged in the repair on a large scale of almost every make of heater, thermostat and pump, and has thus been brought into immediate contact with almost every mishap and fault which can affect electrical apparatus. He has drawn on this vast fund of experience to explain to readers just how and why things go wrong. Mr. Warburton writes in a clear and concise manner and presents his information in such a way that even those with no knowledge whatsoever of electricity can readily understand.

The book runs to over 120 pages and contains 42 diagrams and sketches and some useful tables, as well as some "Market Information" which lists all the better-known products, makers, agents and distributors. There is a foreword, special notice, preface and introduction followed by six chapters which I have summarised below to give the reader a fairly accurate idea of the ground covered.

Types of heaters (immersion, sub-gravel and external), principles of heating, thermostatic control, disasters, ideal qualities of heaters, pros and cons of each type. Control of temperature, experiments on heat required, deductions, differential, types of thermostats, pros and cons of sealed immersion, top-control immersion and externally fitted thermostats. A.C. and D.C. pumps of all kinds, advantages and disadvantages, constant versus intermittent working, back-siphoning, airflow-control systems, fumes, aeration, diffusion points, suction cleaning, filtration, safety measures and alarms, low-voltage operation, etc. A second section, which forms the whole of the last chapter, is technically more advanced and is intended for those who require more information on such matters as setting up and controlling multiple tanks, etc. This covers about 40 pages and includes conservation and dissipation of heat, economy measures, air convection, tanks in tiers, space heating, multiple heaters in parallel and in series, wattage calculations, heaters on different voltages, conversions, bimetals, pilot lamps, lubrication of pumps, oil traps, airflow control, vibrator-pump adjustments, inductance, armature position, silencing, back pressure, precautions in fry tanks, heater positioning, master thermostats, alarm circuits and heater-wattage suggestions.

This book will be wanted by every club librarian, not to mention the club members themselves. Most really experienced aquarists of to-day obtained their knowledge through the hard school of trial and error. With such a book as this the relative newcomer to the hobby has just about every possible aspect of electricity as used for aquaria explained in detail. I feel sure it will be of real use to many who have never really understood the why's and wherefore's of their electrical gadgets, and also be instrumental in saving many fanciers unnecessary losses and trouble.

RAYMOND YATES.

*All About Tropical Fish* by Derek McNerny and Geoffrey Gerard. Illustrations in line, black and white and colour. 480 pages. George G. Harrap & Co. Ltd., London, W.C.1. 75s.

THIS book forms a significant addition to the literature on tropical fish-keeping in this country. Those who have sought detailed books with photographs of aquarium fishes in full colour have until now had to turn to American works, although the quality of the colour

portrayal offered is not always satisfying. In *All About Tropical Fish* the colour pictures, although forming only about one-third of the photographs in the book (about 300 of them), have been well chosen and are not included just for colour's sake.

The text too is satisfying in its full discussion of the practical details of keeping and breeding fishes, and does not confine itself to the more commonly available species. Fishes are grouped in their natural families and are discussed species by species, with a summary of breeding information for each provided where possible. Beginners can take up this book with confidence that it will safely guide them in their early stages and also be of help to them in their fully-fledged state. The reader can be assured of up-to-date information, for Mr. McInerney is a recognised successful and currently practising breeder of fishes.

It is expected that further editions of this book will be needed, and some revisions are recommended here with the future in view. Inaccurate statements such as that on page 38, which indicates that the authors think the sun's rays contain vitamin D, and that on page 62, which has it that fats "feed the nerves," detract from the book's authority. An irritating variation occurs throughout Chapter 4, where the writers appear unable to decide whether to abbreviate cubic centimetres as c.c. or "c.c.'s". Misspellings of fish names noticed include "roseaceus" (page 256), "Phenocogrammus" (page 269), "Pterolibias" (page 307). A feature that has annoyed at least one reader is the positioning of the subject index at the front. Please, authors and publisher, restore it to its rightful place at the back!

A. E.

*The Salt-Water Aquarium in the Home* by Robert P. L. Straughan. 118 black-and-white illustrations; two colour plates. 262 pages. Thomas Yoseloff, Ltd., London, W.1. 42s.

IT is easy to write that no aquarist with an interest in marine tropical fishes should be without this book, for texts on these subjects are all too few. Mr. Straughan's book would, however, be worthy of recommendation with the existence of a score of such books, and is all the more welcome for its originality. The author is an American, a professional collector and keeper of marine animals who first dived beneath the waves to look at fishes at home when he was ten.

Emphasis in the book is, unfortunately for the British aquarist, on the American market and on specimens from Pacific waters. Fundamentals of the practice of keeping marine fishes and invertebrates and marine plants are luckily the same the world over, and the author gives freely of these. Many of the fishes discussed are the ones in the short list of species available here and included is the ever-popular seahorse.

All-glass aquaria are the author's preference for marine use, although these are not available in the larger sizes. "Artificial" sea water is discussed and is rated second-best; some formulae ("formulas") for this are given but these are of doubtful use to the average aquarist (some peculiar chemical symbols and spellings are used on pages 111 and 112). The salt-water community tank has a chapter to itself and so do some accounts of adventures in collecting. The relatively virgin field open to those willing to persevere in attempts to breed and raise marine fishes in aquaria is an attractive feature of this speciality, and if you read this book and then go window-shopping at the "colourful, breath-taking fish" from tropical seas you'll surely be tempted.

A. E.

## Breeding the Blue Acara

(continued from page 121)

days later the female had placed them in a pit in front of the tank, where she mounted guard over a circular mass of wriggling little golden bodies, which, because of a heavy yolk sac, were standing on their heads. These young fry were around 3/16 in. long and were kept in neat order by their mother, who continued to fan them with her fins. She may have taken exception to the writer, who peered at them through a short-focus lens, for she continued to move them to little pits in various parts of the tank until 4 days later they followed her about in a most attractive little school near the bottom of the tank at all times. A scraper used to clean the front glass was vigorously attacked by both parents and the male even bit my finger.

The fry were fed on brine shrimp, micro worms, tinned fish and *Tubifex* and grew rapidly until at the tenth day they were 5/16 in. long and the parents were removed. From then on the young fry exercised their individuality and swam in all areas of the tank, eating until their little tummies were bulging. By this time they appeared to be more of an attractive golden colour, on their under surfaces at least, and the first green spangles showed on the gill plates 14 days after hatching. The illustration is of one of them at 10 days, the fins being very transparent and difficult to see.

Raising the fry was no problem and they were consistent in growth, there being no great variation between the largest and the smallest members of the family. Growth is fairly rapid and pleasurable to watch. There were 187 fry in this batch.

The parents, which were removed and placed in a community tank, spawned there a fortnight later on an Amazon sword leaf and, biting it off, attempted to place it in a flower pot which contained a dwarf lily, keeping all other fishes at bay, which proves that here we have a prolific breeder and a most solicitous parent. Unlike a good many other fishes they do not seem to confine themselves to natural selection of a permanent mate but can be bred with others if they are in breeding condition.

## CURIOUS AMPHIBIOUS FERNS

SEVERAL uncommon genera of aquatic ferns resemble *Marsilea* in their ability to live submerged or exposed. One of them, *Regnellidium*, is almost identical with *Marsilea* in habit and life cycle and is distinguishable only by its larger fronds, which have only two pinnae. It resembles another genus, *Pilularia*, in being able to live as a floating plant, its creeping rhizome advancing over the surface from the water's edge. *Pilularia globulifera*, the pillwort, is native to the British Isles and is a common species of pond and ditch margins. Its hair-like foliage is inconspicuous and very similar to that of *Eleocharis acicularis*, the hair grass, attaining a similar height of 4 to 8 inches; it differs in having its young leaves circinnately coiled and in having black, globular sporocarps borne near the leaf bases. The strange quillwort, *Isoetes lacustris*, is an ally of the ferns which lives in the stony shallows of barren mountain lakes and may be grown in coldwater aquaria, where its tufts of dark-green, spiky leaves are of striking appearance. *I. hystrix* and *I. echinospora* are two other native species more suitable for the moist soil of an aquaterrarium. Species of *Isoetes* and *Pilularia* are only suitable for coldwater aquaria though *Regnellidium* thrives in temperatures above 65° F. All these genera may be successfully grown in composts similar to those for *Marsilea*.

C. D. SCULTHORPE

# The Egg-Laying Tooth Carps

by JOHN S. VINDEN

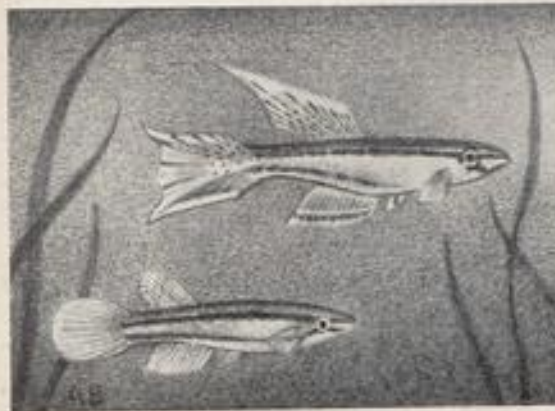
THE egg-laying toothcarps, top-minnows or killiefishes, are members of the large family Cyprinodontidae, which family contains several genera that are of particular interest to the aquarist.

Most of the family come from South America and Africa, though some species live in North America, Southern Asia and even in Europe. Fishes of this group that are most often seen are members of the following genera: *Rivulus*, *Pachypanchax*, *Epiplatys*, *Aphyosemion*, *Aplocheilichthys* and *Nothobranchius*, although species of other genera turn up from time to time.

In recent years there has been much revision in the classification of this group, and fish that have been known for years under one name have been moved into other genera to the advantage of science and the confusion of aquarists. Since many otherwise excellent text-books on fishes still refer to the species under their old names (and many dealers also use them for convenience) it is proposed to give these in parentheses when such fish are mentioned here, in order to avoid confusion.

The popular name, top-minnow, indicates a characteristic of the group as a whole. They are surface fishes which, in the natural state, prey on small insects and other creatures found on or near the water surface. They are nearly all carnivorous, and although most of them will eat good meaty dried food they should be offered as much live food as possible. Ideal foods are *Daphnia*, brine shrimp, mosquito larvae and glass worm. Individual fish will pick food from the bottom, but it is always advisable to keep a catfish or two in the tank for hygienic purposes.

Although it is difficult to make inflexible rules about aquarium conditions for such a varied group of fishes, there are certain generalisations that one can make. To keep these fishes in health and good colour their living conditions should also be good. Few of them are happy in newly set-up tanks, and well-established aquaria with old clear acid water appear to be necessary for the well-being of most of the species. They appreciate surface vegetation, in which many of them deposit their eggs, and the tanks should be well covered, since many of these fishes are accomplished jumpers. Temperature requirements vary at spawning time, but most species, if kept only for display purposes, seem happy at around 75°F.



Male *Aphyosemion bivittatum* is the top fish



Photo:

Laurence E. Perkins

*Aplocheilichthys panchax* (or *Panchax panchax*)

American species that are frequently seen belong to the genus *Rivulus*. The fins of this genus are always rounded and those of the males are never elongated. The bodies are cylindrical and the sexes can be distinguished in most species from the fact that there is a "Rivulus spot" on the upper surface of the caudal peduncle of the female.

Species most often seen are *Rivulus cylindraceus*, *R. hartii* and *R. urophthalmus*. They are quiet fishes and make good community dwellers since they have no aggressive tendencies. They lay their eggs amongst floating plants and, if well fed, they do not consume many of their own young although *R. urophthalmus* has a bad reputation in this respect.

## Aphyosemion Species

*Rivulus* species are gentle and desirable fishes but they do not vie with some of their African cousins for colour, since some members of the genus *Aphyosemion* are the most highly coloured of all aquarium fishes. Every lover of this genus has his own favourite but *A. joestedti*, the red pheasant, appears to be unique amongst aquarium fishes in its colour, for no other species displays exactly the same deep glowing red seen in the male of this species. In addition to red he has blue on his throat and blue edges to his dorsal and anal fins. *A. joestedti* reaches a length of 3 inches and, when adult, cannot be trusted with such fish as guppies for it has a large mouth and appetite to match. It is such an outstanding species that it is worth a tank to itself. It is possible, but not too easy, to breed this species. The breeding tank should have the bottom covered with fine sand or sterilised peat moss, and need not be planted. It should be kept in a subdued light and a well-conditioned pair should be introduced at a temperature of 75°F. They should spawn at daily intervals for about a week. The fish should then be removed and the tank covered with brown paper and left undisturbed for 4 months or more. When the fry begin to appear half of the water may be replaced by fresh water of the same temperature, which will further stimulate the hatching process. The fry are well developed and can be given sifted *Daphnia* and micro worm from the start.

The blue gularis, *A. coeruleum*, is one of the largest members of the genus, for it can reach a length of nearly



*Aphyosemion bivittatum*

6 inches. The forked tail of the male distinguishes it from the female, as does her lack of colour. It is a handsome fish and a good one for the show bench owing to its size. It is, however, difficult to breed and the eggs take a long time to hatch.

One of the most popular and well known of this genus is the lyretail, *A. australe*. Under good conditions it is a hardy fish and one that is within the capabilities of the experienced breeder. The male is one of the most handsome of our smaller aquarium fishes, and the female is not unattractive in herself. Breeding takes place amongst surface plants at a temperature of around 80°F., and both eggs and young may be left with their parents. A pale domesticated variety of this species is sometimes on offer.

*Aphyosemion bivittatum* is another pretty species that well repays the small amount of attention it requires. As its

name implies, it carries two longitudinal stripes. The male has highly developed fins which make a very distinguished fish. The colouring is more subdued than in the two preceding species, but it is far from a dull fish. It must have old acid water for normal health. Many other species appear in the dealers' tanks from time to time, and all are attractive and unusual aquarium inhabitants.

#### Panchax Species

The panchax group of the Old World contains many favourites of the aquarist, amongst which may be named *Epiplatys (Panchax) playfairii*, *E. (Panchax) chaperti*, *E. sexfasciatus*, *Aplocheilichthys blockii (Panchax blockii)*, *Aplocheilichthys panchax (Panchax panchax)* and *A. lineatus (Panchax lineatus)*. Most of these are medium-sized fishes ranging from 2 inches (*E. chaperti*) to 4 inches (*A. lineatus*), which are fairly well behaved in the community tank. Most of them are well coloured and they are, perhaps, not quite so fussy about water as are the *Aphyosemion* group. However, the more the conditions suit the fish the better the fish react, both in appearance and in breeding performance. Given plenty of plants and live food there should be little difficulty in breeding this group. Broods, on the whole, are not large so there should be little danger of the supply exceeding the demand.

Other top minnows sometimes on offer are *Jordanella floridae*, the flag fish, which differs from the majority since it consumes a fair proportion of vegetable matter, *Aplocheilichthys macrophthalmus*, the lampeye, various species of *Nothobranchius*, all of which are worth keeping, and *Cynolebias bellottii*, the Argentine pearl fish. The last named has been bred in captivity, but any aquarist who achieves this feat can consider himself not only lucky, but highly skilled in his craft.

Not on the market, but possibly available to enthusiastic Continental holidaymakers in the summer, are the two European top-minnows, *Aphanius ibericus* from Spain and *A. fasciatus*, which is found generally in the South of Europe including the islands of Sardinia and Cyprus. The latter has been seen in England in recent years, and is an attractive bright-blue fish with several vertical dark bars. Aquarists visiting Southern Italy in the summer might remember that an unusual "tropical" lives wild there, and with luck they might be able to bring back a pair or two to establish a breeding stock in this country.

## News of Durban Aquarium

WHILE cameramen of Centrepol, a German film unit, were shooting underwater scenes at the marine Aquarium at Durban, Natal, South Africa, recently, the heat from the arc lamps cracked two of the ground-floor observation windows. However, the glass panels, designed to withstand the pressure of the 180,000 gallons in the tank, did not give way. Dr. David Davies, director of the research station associated with the Aquarium, announced that only a trickle of water had oozed through the hairline cracks.

There were 900 deep water fishes in the tank at the time. No harm came to them. The tank, 18 ft. deep, was at once drained to a level of 3 ft. 6 in., and the two damaged viewports were replaced and the tank was refilled within 24 hours. To sustain the fishes while the water was at low level, a compressed-air sand-cleaning device was brought into use.

Durban's beach-front aquarium, completed only 6 months ago, and attracting a quarter-million visitors in 4-5 months, is the property of the South African Association for Marine Biological Research, and is but the first

stage in the construction of a project which will make the Aquarium one of the most comprehensive in the world.

With a spacious garden layout, the £150,000 additions will include: a 100 ft. by 80 ft. shark pool, with bridges leading to an island from which the public will be able to watch; a 60 ft. by 35 ft. porpoise pool, with an underwater and elevated viewing galleries; a freshwater pool with an island for amphibians and a rock pool for penguins and seagulls.

Water in the present tank is changed 3 times every 24 hours by means of a filtration plant which eliminates any milky appearance of the water. Open at night as well as day, the Aquarium has 48 observation windows, each costing £60, the glass being 1½ in. thick. Three divers are kept permanently employed.

Many of the hundred-or-so species of fishes have been caught off Durban's Indian Ocean shore. They include grey sharks, butterfly fish, sturgeons, parrot fish, boxfish, cowfish and swordfish.

A well-known local sugar magnate, Mr. W. A. Campbell, has donated £10,000 towards the cost of the new additions, for which extra land has just been acquired along Durban's beach-front.



# AQUARIST'S Notebook



by

RAYMOND YATES

MRS. SALLY HALL of Nevada recently leased a plot of some 256 acres which contained nine very fine natural hot springs. The three main springs flow a total of 1,000 gallons a minute into baths houses, but the others were mere trickles which eventually flowed off the property into a main beneath the highway. During the warmer weather the water seemed to disappear and an effort was made to dig up the surface soil to trace it. No sooner said than done. There was the water and with it—fish. Examination showed these to be tiny pink and white fishes, up to an inch and a half long, with white bodies, pink finnage and red eyes. From their antics it was assumed that they were blind. Enquiries from the natives brought forth the fact that the underground river (the Amargosa) is very close to the surface and as for the fish, yes, they were known of, but were useless for eating. Why bother? The water temperature was between 86° and 91° F., and tests by the University of Nevada established a 28 per cent. sodium salt content with a remainder of pure cosmic or volcanic water. This kills plants and makes the teeth of cattle fall out—how do fish manage to thrive in it? More diggings produced more fish and at last a stranger pronounced them as being cave fish, which were said to have been kept in aquaria with little success. There seems to be no record of this species in the records generally available to hobbyists.

At the recent B.A.F. at Manchester Dr. F. N. Ghadially told me that he was always looking for fresh fields to conquer and that his interest at the moment was in hybrids. Writing in the *Boston Aquarium News*, Dr. William Nixon makes some interesting points on this topic. He suggests that it might be possible to hybridise many more of our fishes than has so far been the case and takes the view that this is a field in which a lot remains to be done. Many different species of plants and animals can be crossed, often yielding offspring which are quite unlike either parent, although having some of their characteristics. The mule with donkey father and horse mother is a good example, as horse and donkey are different but closely related species whose offspring is a sterile mule. However, such crossings do not always produce sterile youngsters, as in swordtail  $\times$  platy crosses. Sometimes, as in trout crossings, the hybrid is more fertile, viable and vigorous than either parent. Another unusual aspect is the fact that the mating of a male of one species (A) with the female of another species (B) may differ from the offspring of the reciprocal cross where the male is (B) and the female (A). Harking back to the horse  $\times$  donkey cross, when the father is a horse and the mother a donkey the offspring is a hinny, a quite different animal from the mule. Tiger father and lion mother produce tigons (there is one at Belle Vue Zoo) but the reverse is a lion. With fishes, if the hybrids breed true a new fish type is created, or at least one which can perhaps be improved by line-breeding later. If the hybrids are sterile they may be very beautiful and there would always be a market as many aquarists keep aquaria for show and do not want fishes for breeding purposes. Hybrids often have greater stamina, as with the crossing of the male brook trout with a female brown trout, which gives a tiger trout (U.S.A.) which is far more beautiful, tougher, faster and meaner—desirable traits in game fish.

Cichlids are so numerous that some crossings could be attempted, particularly between those from different continents. Dr. Nixon expresses the hope that anyone successful in this field should make the details available for scientists to make use of the data.

Collected barbs: "Aquarist societies are full of willing

people—people willing to work and people willing to let them."

"Life is what you make it until somebody gives you some guppies and makes it worse."

"Some aquarists climb the ladder of success wrong by wrong."

"Mother: 'Give your fish some fresh water, son.'"

Son: 'What for? They haven't used what I gave them last year.'"

"Two little goldfish were swimming in a bowl. 'Do you believe in God?' asked one. 'Of course,' said the other, 'who do you think changes our water?'"

"One aquarist to another: 'I never realised how much these little fish brightened up our home until I got the electric-light bill.'"

On a recent visit to Liverpool I looked in on Mr. Bailey at the Liverpool Aquaria, which has now moved into new and better premises for the third time in a few years. Each of the shops has been within a hundred yards or so of the others. The new shop is really first class, with a double frontage and most attractive window displays. When I was there one window had a cage full of agoutis which delighted everybody who came along by their amusing antics. The basement is the fish department (a question of weight of water) and about 40 tanks catch the eye, the frames being tastefully hidden. One side is labelled "Home Bred" and the other "Imported," so the purchaser is left in no doubt about origin. Prices are clearly marked and I noticed quite a number were priced per pair, a method of selling which seems to have gone out of favour in recent years. I asked if a large floor pond was going to be built (as in the last shop) and this is shortly to be undertaken. I was very interested in the use of large plastic bowls on the counter to contain many varieties of plants, also coldwater fish and axolotls. Some very large plastic garden pools attracted my eye; these had two depths, one for fishes and a much shallower end for marginal plants. Liverpool hobbyists are certainly fortunate in having such a go-ahead concern right on their doorstep. For example, one tank contained leaf fish and pike cichlids . . . hardly common or garden fishes with most dealers. I must look in again next time I find myself Liverpool way.

At Chester cathedral some time ago I found myself in the garden through the cloisters. Here there is a delightful fish pond, with plants, lilies but no fish. Perhaps the reason is the "coins in the fountain" idea, which would prove hard on the fish. There was certainly a large amount of copper (pennies) in the pool. However, it did not appear to have any adverse effect on the plant life.

Orfe of the golden variety are either a rich ochre or a pale-yellow. I have always thought the latter colour to be due to poor conditions or feeding. Last winter I bought two "lemons" in a shop and kept them in a tank for some months. No change in colour resulted. I then put them in my pond and was quite surprised to find how, after some weeks, they changed to the lovely ochre colour of a good orfe. I know all the data on colour, and feel that orfe lose colour under adverse conditions only to regain it in more suitable circumstances.

# The Hog-Nose Snake

by ROBERT BUSTARD

*Photographs by the author*

**T**HERE are a number of North American snakes which are firm favourites of reptile-keepers on both sides of the Atlantic, and the hog-nose snake, because of its extraordinary habits and hardy nature, is one of these.

The Eastern hog-nose snake (*Heterodon platyrhinos*) grows to a length of about 3 feet but many of the specimens for sale are only about 2 feet. The coloration is variable, but one common colour scheme incorporates yellow blotches on a dark background. The most handsome specimens have the yellow replaced by red on the anterior part of the body. Specimens which are totally black above and white ventrally are encountered in mountainous regions.

This completely harmless little snake has earned such names as "spreading adder" and "puff adder" owing to its

display behaviour. It is a great bluffer and when disturbed it coils up and hisses loudly. At the same time it inflates its lungs with air, appearing much larger than it really is. The deadly appearance is enhanced by the upturned snout (which is used for burrowing) and the manner in which it flattens its head and neck region. This is brought about by moving anterior ribs, which normally lie close to the body, and, when moved to make a right angle, expand a fold of skin and give a somewhat fearsome appearance. This same feat is seen to perfection in the cobras, where the hood, with the eye-markings on the back, is very impressive.

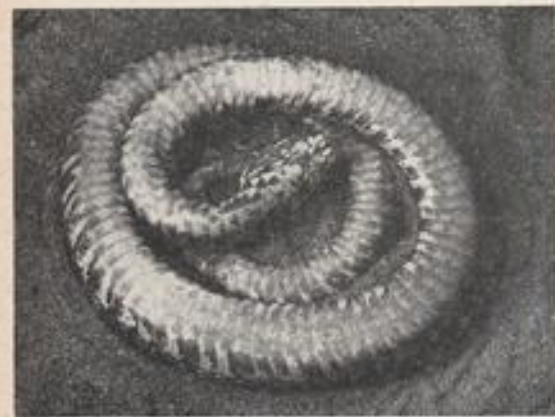
The display of deadliness can turn to one of aggressiveness and indeed may be kept up for some time. If the



A hog-nose snake starting to writhe in the early stages of its "sham-death" act



Commencement of the turn on to its back in the hog-nose snake's "death" display



Writting movements continue as the hog-nose snake lies on its back with mouth open



Movements stop and the snake lies as depicted, although it will turn over again if set round the right way and continue to feign death

snake is not provoked further it will remain hissing for several minutes. If, however, it is disturbed it may even strike at the enemy. Should one look closely, one would detect that the strike is usually made "past the enemy" and not at it, and it is also made with the mouth closed—so very different from the behaviour of a venomous snake. This "dummy striking" is also seen in the egg-eating snake (*Dasypeltis scaber*), where it is all the more amusing since the snake is practically toothless and a bite could have little effect. The important thing to realise is that bluff is widespread in nature and it is seldom challenged. Would you wait to see if a snake actually struck at you? This aggressive behaviour must indeed save the life of many of these snakes. The bright coloration is also helpful to this snake since yellow, orange and red are warning colours in nature.

The hog-nose snake is a wonderful actor and has another very convincing little trick. This is the "dying act." If we were not frightened off by the display of aggressiveness then suddenly the snake starts to writhe around as if in convulsions. After a short time it turns over on to its back, the mouth opens and the tongue hangs out. The writhing continues for several moments and then the snake

remains motionless—to all intents dead. Should we remain still, however, we will see the snake slowly turn over and move off, although should it see us it will very likely sham dead once more. There is one interesting point about this performance—the snake feels that it must be lying on its back to be dead; should we poke it when it is shamming dead it remains still, but should we turn it over right way up, it turns upside down again and then remains motionless as before.

It should be made clear to the reader that this is innate behaviour over which the snake has no control. Thus the snake is not behaving in a "clever" manner but instinctively. This is borne out by the stereotyped act it performs, the various motions being shown in the accompanying photographs.

In captivity this snake does well in a sandy vivarium at a temperature of about 70° F. A vivarium of 24 in. by 12 in. by 12 in. would be suitable for a couple of these snakes. They feed on toads, and captive specimens soon settle down and feed well. Unfortunately, once they become tame they are loathe to perform, but they are still very handsome specimens and well worth a place in the collection.

## Indoor Ponds

**A**T the Caravan Exhibition held in London this year there was an eye-catching display of water gardening as part of the exhibit arranged by the United Dominions Trust. The display was the work of Neale Brothers (Nurseries) Ltd., who have kindly supplied these notes on the project.

The idea was to construct a pool and rural setting for the two business caravans of U.D.T., and this necessitated the use of many plants which would not normally grow in the open air and would most likely not be in flower at the same time under ordinary conditions.

The general construction was Somerset peat for the planting areas and the higher levels, and Westmorland stone was used for the rocky effects. The pools were made of 10 ft. wide black polythene, and they were shaped by turning the polythene under and edging it up into a basin by pushing peat under the rim. The aim was to have a pool containing about 4 in. of water.

After the polythene was in position water pumps were installed at the highest point of the garden, and in order that the distance of throw of the fountains could be regulated, two Stewart Turner single-jet nozzles were used. As the pools were approximately 12 ft. long by 6 ft. wide, it was important that the fountains should give maximum

agitation to the water in order that a scum should not be formed. For this purpose the jets were ejected almost horizontally from one end of the pool to the other, and this provided a current round the full area of the pool.

After the pools were filled, washed grit, rocks, stones and driftwood were placed in various positions to give decorative effects in the water. After the planting had been completed and the fountains had been on for several hours, about 30 goldfish (each approximately 2 in. long) were added to each pool.

During the 10 days the show was on, the fish derived almost their entire food from the ice-cream wafer biscuits which visitors dropped into the water! An interesting feature was the way in which the fish seemed to line up into single file to swim under the jets of water, and despite their unusual diet, not a single fish was lost throughout the entire show.



# RIVER SNAILS

by T. PAIN and J. A. WILLSON

THE canals, rivers and lakes of central Europe possess amongst the population of numerous small molluscs, two of large size and characteristic structure. These two large snails of the Viviparidae constitute an important feature in our English freshwater fauna.

They have rather thin, conical shells, with six or seven convex whorls, of a dull green colour and with three brown spiral bands. Like the big Ampullaridae of the tropics, they close the aperture of their shell with a horny plate called an operculum. The male is distinguished from the female by its smaller size, and by its right tentacle, which is shorter, blunt and depressed, with a terminal aperture through which the penis is protruded. The eyes are borne on knobs near the bases of the long tentacles. The foot is broad and round in front, and the snout prominent.

The eggs are retained in the oviduct or uterus until the development of the embryos is complete, and then the fully formed young escape from the mother in late spring. When newly hatched their shell is clothed with "hairs" and has three prominent spiral ridges bearing short spines. The adult shell is, however, smooth. *Viviparus* feeds, like most freshwater snails, on algae and decomposing organic matter, as well as on succulent aquatic plants, but occasionally becomes carnivorous and feeds on the dead carcasses of snails or fishes.

The respiration of the Viviparidae is entirely aquatic and is by means of a gill. The animals are not able to breathe oxygen direct from the atmosphere, but being operculate snails they are able to withdraw themselves entirely within their shells, the aperture of the shell being then closed by the tightly fitting operculum. In this condition they are able to live for short periods out of their natural element. A specimen of the common British river snail (*Viviparus viviparus*) was kept on dry ground exposed for over 3 weeks without in any way injuring the animal. Under exceptional conditions of drought, temperature, etc., they are capable of aestivating for varying lengths of time. At such times they lie deeply embedded in the semi-dry mud at the bottom of the pool, lake, etc., with the animal withdrawn into the shell, but there can be no doubt that they cannot live in this condition for very long periods.

Two species of *Viviparus* are found living in Britain: *V. viviparus*, the common river snail, and *V. contectus*, Lister's river snail.



Photos: J. A. Willson

Shells of *Viviparus contectus* (left) and *Viviparus viviparus*, both collected in Oxford

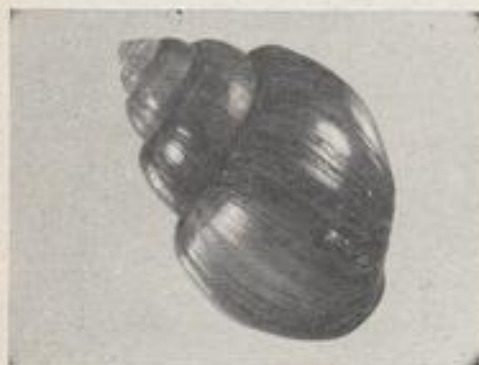
In *V. viviparus* the shell is not very glossy, the whorls do not bulge out into an angular shell as in *V. contectus*, and the apex is blunt. Shells of this species vary in size from  $1\frac{1}{6}$  to  $1\frac{1}{2}$  in. in height, and  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. in greatest breadth. The animal is dark grey with burnished mottlings.

The shell of *V. contectus* is thin and glossy, the whorls are very swollen, with a sharply pointed apex. It varies in size from  $1\frac{1}{6}$  to  $1\frac{1}{2}$  in. in height and from  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. in greatest breadth. The animal is dark grey with golden spots.

*V. viviparus* frequents slow rivers and canals throughout England from Devon to Yorkshire. *V. contectus* has a similar, though more restricted and local, distribution. Neither occurs in Scotland or Ireland, and their present distribution beyond the Thames drainage area may be attributed mainly to the extensive system of canals built to link our waterways during the nineteenth century.

The river snails have a long and interesting geological history, and may have originated in the Devonian Period. The oldest fossil records are of Jurassic age, a fossil species occurring in vast numbers in the famous Purbeck Marble.

Both the British species are found living in Central Europe, where in the Danube and Po valleys they attain a



A large and heavy viviparous snail from the U.S.A. is *Campeloma ponderosa* (the specimen shown is from Ohio)



An old eroded shell of *Tolutoma magna* from Alabama, U.S.A.

much larger size than in Britain. As a family the Viviparidae enjoy a world-wide distribution. They have been divided into two sub-families by conchologists on account of differences in the male sexual gland: Viviparidae, which includes the species inhabiting Europe, Asia Minor and North America, and Bellamyinae, those from Africa, Asia and Australia. Species of Viviparidae are in fact found on all the continents except South America and Antarctica and extend from the tropics to Arctic waters.

In North America, particularly in the Mississippi and Missouri basins, *Viviparus* are very abundant, where as well as typical *Viviparus* resembling those from Europe occur forms with thick and heavy shells, some bearing knobs, spines and showing a great variety of shell ornament. These, because of differences in shell and animal, have been placed into separate genera, *Campeloma*, *Tudotoma*, etc., but all have in common the viviparous method of reproduction.

The British species *V. viviparus* and *V. costectus* have both been introduced into the eastern part of the United States, and Japanese species of *Bellamya* have been established in a number of places on the Pacific coast of both Canada and the United States, introduced by Japanese labourers who use them as an article of food.

As will have been seen from a study of their distribution the river snails can adapt themselves to many changes of both climate and temperature, and are therefore tolerably hardy animals. *V. costectus* ranges as far north as Finland, and *V. viviparus* has been known to produce a batch of young shortly after being thawed out from a temperature of 23°F.

For those who like to keep snails in their fish tanks the river snails have much to recommend them, though being rather large they must be kept in much smaller numbers than the more popular species, say, one to a 24 in. tank.



*Bellamya malleata*, a viviparous snail collected in Ohio, U.S.A.

The aquarist can keep the number under control by selecting only males for introduction into his tanks. This is a great advantage over smaller snails where it is not easy, and sometimes impossible, to differentiate the sex, with the result that the tank is soon overcrowded with snails.

There is a risk of introducing disease when adding new "live stock" but this can be lessened by keeping the snails for a short time in a weak solution of potassium permanganate. The snails should, of course, be kept out of tanks containing fish eggs or small fry.

If you have a spare tank it would be interesting to keep a pair of these snails and watch for the arrival of the young, covered with "hair" and bearing short spines. In this condition the small snails would make an attractive and unique addition to the cold or tropical aquarium.

## None for the Pot

by JAMES L. KELLY

**H**AVE you a type of person you dislike? Most of us have! Unfortunately most of my dislikes seem to make a habit of congregating at fish shows.

Dislike Number One is usually met early on in the procedure of benching one's fish. While you are struggling with a fish jar in one hand and a net in the other (wondering if it is all worth while), he sidles up to you and tells you that in his opinion your fish hasn't a dog's chance and what's more it will probably have turned up its fins and joined its ancestors before the judging starts.

Menace Number Two is more subtle. He is the judge-worrier. When not interfering with the man he is telling all and sundry that the judge couldn't tell a good piranha from a bad one even if it bit him. Their names are conspicuous by their absence from the list of prize-winners.

We have often laughed, no doubt, at the antics of the little man on television when he informs us that a well-known brand of tea "needs none for the pot," but it is no longer a laughing matter when I find more and more pot-hunters making my dislikes Numbers Three and Four. These need a lengthier discussion.

Perhaps you are wondering what I mean by pot-hunters? Well, they come in various shapes and sizes, but the two most common are first the fellow who seems to have unlimited capital and spares no expense to purchase fishes just for the purpose of entering them in shows. The second culprit, at first glance, seems to be "a great guy," but on second thoughts is just as big a menace. He allows other people to enter his fishes under their own names.

Open shows, table shows and the like are excellent things

when not abused. They enable us "fishy types" to get together in an atmosphere of healthy competition. But unfortunately they are being spoiled and turned into a rat race by the minority who wish to paper their fish houses at some society's expense.

The Federation of Guppy Breeders Societies like so many others have a definite ruling about fish entries. They say in their Show Rules that the fish must be the bona-fide property of the exhibitor and must have been in his or her possession for at least 28 days before the date of the show. This seems to be the answer, but only, and I repeat only, when a sense of fair play prevails.

It is very difficult for a show secretary, unless he has an intimate knowledge of an exhibitor's fish house (and in most cases this is very unlikely), to enforce the 28 days ruling. Even when he is given the power to demand proof of ownership, I wonder how one goes about proving this?

The only solution is within all our grasps, as I said before, playing the game. We should take a sense of personal pride and achievement in our "pots."

It must be very disheartening indeed to the conscientious fish-keeper and breeder, who, after much hard work and effort, was probably pipped by a "pot-hunter" whose only effort was probably "dipping his hand into his pocket."

Let us enter into the spirit of the thing and only then can we point to our trophies with pride and honestly make it "none for the pot-hunters!"

Have you any types you dislike? Who knows, I may be one of them!

## our readers

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.

### Production of Gases by Water Plants

THE vast majority of people who keep fish in aquaria have observed at some time or another the steady flow of minute bubbles that stream from many aquatic plants when these are exposed to full sunlight or strong artificial light. That the intensity of light is essential to the production of this quantity of gas can be proved by gradually increasing the distance between a strong artificial light and the plants under observation, when the stream will become slower and slower and finally cease so far as visual observation is concerned, even though the plant is still quite well illuminated.

Bearing this in mind, I would like readers to consider the statement made by Mr. C. D. Sculthorpe in the April issue of *The Aquarist*: "The main fallacy in this argument, and it is a common one, is that gases produced within the plant are passed out into the water; this is most definitely not so for those plants studied, and it has been known for many years that in *Elodea* spp., *Myriophyllum* spp., *Potamogeton* spp., *Pistia stratiotes* and others, gases, particularly oxygen, are retained within the intercellular lacunae of the stems, roots and leaves, from where they diffuse to other parts with a lower concentration, thus circulating within the plants and incidentally giving it buoyancy." It will be noticed that two of the plants mentioned, i.e. *Elodea* spp. and *Myriophyllum* spp., are amongst those from which streams of oxygen are the most readily observed. We are all aware that aquatic plants use the gases they produce to give buoyancy, any excess over and above these requirements is released into the surrounding water, a fact which is so easily verifiable—even by a child—that further discussion is unnecessary.

In view of the above I feel that the rest of his remarks can be left for what they are—namely, a deliberate misinterpretation of what was implied coupled with comments on alleged statements which were, in fact, never made.

N. E. PERKINS,  
Beckenham, Kent.

### East German Aquarists

DURING my recent visit to Germany for the East German Federations Congress, it was brought to my attention the vast amount of interest East German aquarists have for your publication and events in England. I promised to try and arrange correspondents for one or two who speak and write English, and I am wondering whether it would be possible for you to publish their names, addresses and interests, in an effort to get some of our people to write to them and exchange ideas. If this can be done, it might



# write

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

serve as a useful exchange of ideas. Their names are as follows: Roland Friedel, Leipzig N.22, Ludwig Beck Strasse 18 (reptiles and amphibia); Roland Friedel, Senior, Leipzig, D.D.R., Ludwig Beck Strasse 18 (reptiles and amphibia); Werner Dietze, Kreis Geithain, Bezirk Leipzig, Grandstein No. 23 (fish and plants); Manfred Bojanowski, Kamenz/Saxony, Macherstrasse 29 (*Hyphessobrycon* species and *Cryptocoryne*).

R. O. B. LIST,  
London, N.W.6.

### First Breeding Success

I WROTE to you a few weeks ago, asking for information and help in the breeding of the dwarf cichlid *Pelmatochromis kribensis*. I was having trouble with the eggs being eaten by the parents; keeping them with the male on its own or the female did not make any difference, and the eggs were eaten on the third day or all became covered with fungus.

Your information was a great help to me and, after trying various methods, I am very pleased to inform you that I have now had success. I used part of your information and partly my own. I do not know whether this is a record for dwarf cichlids but I have not had a loss, from eggs to fry. The young fry are now 7 weeks old and are 1 in. long; the total from one spawning is 138 from only one pair of adults. The fry are now showing colour on body and fins and I have yet to find a runt.

I am very proud of my efforts (and yours); it is in fact your spawning, because I had had no success until you kindly obliged me with information. If any aquarist wishes to know about the breeding process, I will be only too pleased to give him any information and help if he will write to me. I have bred quite a few other fishes but this is my greatest triumph, and I would like to know if it is a record or near one anyway. I feel I am now an aquarist, and it is to a great extent through your wonderful magazine and information service.

H. RUSHTON,  
30, Kent Avenue, East Cowes,  
Isle of Wight.

### Siamese Twins

I HAVE a pair of Siamese twin guppies, both female, born on 10th August this year and although the fish are small they are very lively. Joined at the stomach, one has to remain permanently upside down; the upper one seems to be the stronger and slightly larger although I have noticed this last few days that the lower fish seems to be

getting stronger and at times the pair are to be seen swimming on their sides as though the bottom fish were trying to get the upper hand.

I have read in various books and publications that fish Siamese twins rarely attain a month or more, but this pair are now at least 3 months old. The greatest difficulty they seem to experience is in the feeding, since when the top fish has food at its mouth the bottom fish has to take what happens to be near and not being strong enough to pull the other one never seems to get a choice of food.

The parent female has since had three lots of fry without repeating this performance, but the twins are only the size of the last lot of fry, about half an inch long.

Normally they swim rather jerkily, since one pulls against the other, but when both tails are in unison the fish move lightning-fast!

A. BATES,  
Old Basford, Nottingham.

#### Lecturer's Services

YOUR readers are once again asking for the names of lecturers. I am willing to travel any distance on an approximate 80 mile radius from Cambridge. This allows me to return the same evening. Full details of my film-show lectures are:

*The Fighting Fish of Siam* (colour). A film depicting the fighting and breeding of this colourful species.

*The African Clawed Toad* (monochrome). This shows the general characteristics of this purely aquatic creature. The scenes depicting it taking food from a large cichlid are very funny.

*Tropical Aquarium Fishes* (colour). A survey of common and rare aquarium fishes.

*Blue Gouramies from Sumatra* (monochrome). The breeding of blue gouramies in an aquarium.

*Tropical Aquarium Plants* (colour). Plants for the tropical aquarium.

*Zoo Life or Safari to Kenya* (colour). The society has a choice: *Zoo Life*—a trip around the London Zoo; *Safari to Kenya*—a film record of a holiday in Kenya with a visit to the Royal Aberdare National Park.

All the films are my own productions. The approximate length of each film-show lecture is 1 hour 15 minutes.

MASON SMITH,  
42a, Rustat Road, Cambridge.

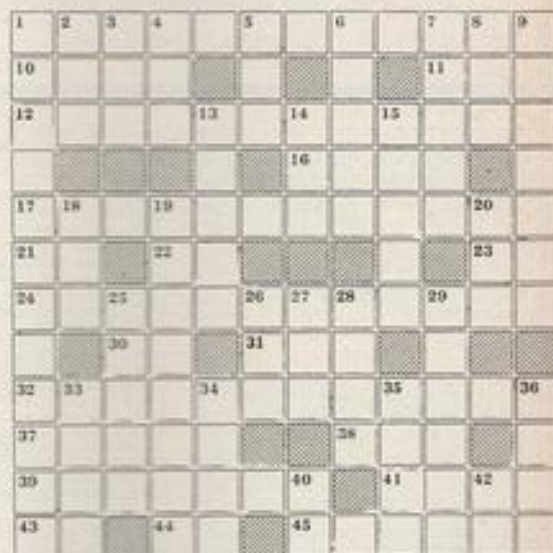
### Care of Aquarium Plants

DO not think that once the tank has been set up and planted there will be nothing else to do except feed the fishes and give it the weekly servicing. Many of the plants will need as much attention perhaps as your plants in the garden. Many will have grown too tall and become matted at the surface, so shutting out much of the light from overhead. Others may have had pieces broken from them by the fishes, and these pieces float to the top and again make a mass of vegetation.

The tall shoots can be cut with a pair of scissors and the long ends replanted in the same tank or another one, if required. It is well to treat a few stems each week so that not all are cut down at the same time. The cut pieces can be carefully tied with a piece of wool to a lead weight and the bunch will send out more shoots which will make a nice thick plant. If strips of lead are used to pinch round the stems it is probable that they will be severed or bruised so that they do not grow well. If plant pieces have floated to the top and have made roots they can be loosely bunched together and placed on the bottom with a stone to keep them in position whilst they are making a firm hold with their roots.

## The AQUARIST Crossword

Compiled by J. LAUGHLAND



#### CLUES ACROSS

- Ornamental pools and their surroundings (5, 7)
- Direction (Scottish) (5)
- "A lot of holes tied together" (3)
- Could be 37 Across or any other gourami (12)
- Pain in the montache (4)
- Hill rat virus for this fish (7, 5)
- Long metre (1, 1)
- The Five Counties (1, 1)
- Half a moon a bit off? Just the reverse (2)
- Fish worshippers, literally (12)
- Officer in charge (1, 1)
- Bring forth young (3)
- External parasite (12)
- See 12 Across (5)
- Colloquially, can (3)
- Ailment (7)
- The river for a trial (4)
- Mr. Capone, perhaps (2)
- One of the old railways (1, 1)
- Essay on a theme (6)

#### CLUES DOWN

- Aquatic plant with succulent foliage and lavender flowers (5)
- This from 10 Across could be stormy (3)
- Latin prefix meaning three (3)
- And so on (3)
- George looks rather short (3)
- British freshwater fish (5)
- Come in (5)
- Formerly (3)
- Breeds (7)
- Prefix meaning sun (5)
- Vapour (3)
- Miss Wallis, the well-known actress (5)
- Not a young angel, anyway (3)
- Fabulous one-horned animal (8)
- Tiny tetra (3)
- Oh, let us stay there (5)
- Sheltered side of a leak (3)
- Appendage for swimming with, as in water boatman (3)
- Genus of dipterous insects found in marshlands (4)
- Sticklebacks make a point of these (6)
- Unit-meas of living matter (8)
- Could be ripe place for fishing from (4)
- Para this place could be fish house (4)
- Newts (4)
- This IS a little angel, perhaps (2)
- Yes, senior (2)

(Solution on page 135)



## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

AT the annual general meeting of the **Hounslow and District Aquarist Society** it was announced that the society had had a very good year, with many more entries for the table shows. The "Best Fish of the Year" was a "lace gourami" owned by Mr. M. Worms and he was also the highest points winner in the past year's table shows. Recently the society paid a visit by coach to Messrs. Whitwell & Smykala at West Bergholt, Essex, where an enjoyable afternoon was spent. Meetings of the society are now held on Wednesday evenings fortnightly at The Labour Rooms, 20, Heath Rd., Hounslow. Visitors are always welcome.

RECENT events in the programme of the **Guildford and District Aquarists' Club** have included the award of the Deochoy Kellett Cup for the highest number of points in the Table Shows during 1959. This was won by Mr. H. J. Aylott, with a total of 109 points. Recently Mr. W. Coveney gave a very instructive talk on Electricity as applied to Fishkeeping, with many fine drawings on a small blackboard to illustrate the points he was explaining. He answered many questions from the members, who found his talk most interesting and helpful.

AT the November meeting of the **Ilford and District Aquarists' and Pondkeepers' Society** an inter-club quiz was arranged with the East London Club. The table show was for male and female guppies and the winners were as follows: Female—1, Mr. Hartley; 2, Mr. Stebbing; 3, Mr. Hunter. Male—1, Mr. Stebbing; 2, Mr. Hartley; 3, Mr. Stebbing. The results of the Society's annual home aquarium and pond competitions, announced at the October meeting were: Home Aquarium—1, Mr. Hunter; 2, Mr. Nott; 3, Mr. Smith. Pond—1, Mr. Nott; 2, Mr. Smith; 3, Mr. Atkins. At this meeting coloured films were shown by the President, Mr. Jarvis and the Secretary, Mr. Price.

Anybody interested in the hobby living in this area will, of course, be welcome at future meetings and should write for information to the Secretary, Mr. V. Price, 1a, Horace Road, Barkingside, Ilford. The next meeting will be on Monday, 14th December at 7.45 p.m. at Newbury Hall, Perryman Farm Road, Ilford.

ACTIVITIES of the **Kingston and District Aquarist Society** recently have included the election of officers for 1960.

Mr. H. J. Lambert becomes chairman and Mr. H. E. Woods vice-chairman. Mr. Peattie resigns as treasurer and is replaced by Mr. A. L. Barber who has been chairman for the last few years. The secretary Mr. C. J. Henry and show secretary, Mr. V. Stevens, retain office.

December meetings will be the Club Supper and a Brains Trust where the "Brains" will be the four ASLAS Judges Messrs. Groves, Towell, Stevens and Henry.

MR. L. CONNELL spoke on the Habits and Adaptations of Animals and Fishes at the **Wirral Aquarists' Association** early meeting. He illustrated his talk with coloured slides showing both animals and fish, and confidently answered some sticky questions afterwards. Mr. Connell also presented a cup and plaque to Mr. J. C. Faulkner, who won the Annual Furnished

Aquaria Competition, and a plaque to Mr. L. Fidal, winner of the Pond Competition. Colour shots of the entries were taken and it is hoped to show them shortly. The last meeting was a general "matter-night," when members discussed various problems among themselves.

THE recent A.G.M. of the **Bethnal Green A.S.** saw the retirement as Chairman, of Mr. H. Penton, owing to heavy business commitments. He was succeeded by Mr. A. H. Scott, a long-standing member of the Society and last year's General Secretary.

At their first meeting the new Committee drafted a most interesting programme for the coming year, and local enthusiasts will be most cordially welcomed at the Society's meetings, which are being held every Tuesday evening from 7.45 p.m. at their headquarters, 229, Bethnal Green Road, E.2. Mr. D. Cannon is resident lecturer for the Society and any other information may be obtained from the General Secretary, Mr. A. Collings, 11, Arrowsmith Road, Chigwell, Essex.

THE Annual Open Show of the **Scottish Aquarist Society** was held in Glasgow and once more this proved to be the meeting place for many Scottish aquarists. One feature which gives considerable hope for the hobby was the increase in the numbers of school-children who attended and also the exceptionally high

entries in the school exhibits in the familiar aquaria classes.

Special exhibits included an excellent collection of Marine Life from the Fish of Choice including an octopus kindly supplied by the Marine Biological Station at Millport and many of the freshwater fish which dwell in one of Scotland's most well known lochs including the Powan (freshwater herring) kindly collected and supplied by the University of Glasgow from the research station at Loch Lomond.

Out of some 250 entries the following were successful.

Special Awards:—The Beltrics Shield for the best fish in the Show, Calico Veiltail, W. Pollok. The Peter McNish Trophy for the best exhibit in the Tropical section, Kanna Gourami, A. Watt. The Robin Kerr Trophy for the best exhibit in the Coldwater section, Calico Veiltail, W. Pollok. Breeder's Trophy, Shubunkins, J. H. Hood and Miss B. K. Gibson. The Smith Trophy, Bettas, Apistogramma Ramirez, Dundee Aquarist Soc. S.A.S. Inter-club Trophy, Greenock and District Aquarist Soc. S.A.S. Furnished Aquarium Trophy for the best furnished aquarium set up by an individual member, A. T. M. Robertson. The Savers Cup for the best furnished aquarium set up by a school, Bellahouston S.S. School. Strachan Kerr Trophy for the best furnished Coldwater tank set up by a Junior or Juvenile member, A. Young, Jr. The Water Life Cup for the best exhibit by a Junior or Juvenile, A. Young, Jr. The President's Prize for the best common Goldfish exhibited by a member, Greenock Aquarist Society.

Common Goldfish: 1, Greenock Aquarist Society; 2, A. MacLeod; 3, A. MacLeod. Shubunkins: 1, J. H. Hood and H. R. Gibson; 2, J. H. Hood and H. R. Gibson; 3, A. Young. Fancy Goldfish: 1, Calico Veiltail, W. Pollok; 2, Scaled Fantail, J. H. Hood and H. R. Gibson; 3, Moor Fantail, W. Pollok. A.O.V. Coldwater fish: 1, Tench, K. A. M. Robertson; 2, Golden Orfe, K. A. M. Robertson; 3, Mirror Carp, Greenock Aquarist Society. Guppies: 1, Golden Flagtail Guppy, H. Kerr; 2, American Veiltail Guppy, E. Readings; 3, Golden Scaletail Guppy, H. Kerr. Swordtails and Parrots: 1, Black Swordtail, H. Kerr; 2, Albino Swordtail, T. Seymour; 3, Redeye Red Swordtail, H. Kerr. Mollies: 1, A. Watt; 2, H. Kerr; 3, S. Naimith. A.O.V. Livebearers: 1, Mosquito Fish, K. A. M. Robertson; 2, Mosquito Fish, A. Watt. Danios, Egg-laying Toothcarps, Tropical Minnows, Rasboras: 1, Striped Parach, J. Wylie; 2, Pearl Danio, H. Kerr; 3, White Cloud Mountain Minnow, S. Naimith. Characins: 1, H. rosaceus, G. Dalrymple; 2, Penguins, A. Watson; 3, Lemon Tetras, A. Watson. Barbs: 1, Nigger Barb, H. Kerr; 2, Rosy Barb, T. Seymour; 3, Cherry Barb, H. Kerr. Dwarf Cichlids: 1, Apistogramma ramirezi, Dundee Aquarist Society; 2, Peimatochromis kribbenis, S. Naimith; 3, Apistogramma Agassizi, S. Naimith. Labrinesh Fish (Anabantids): 1, Kissing Gourami, A. Watt; 2, Pearl Gourami, A. Watt; 3, Dwarf Gourami, J. Low. A.O.V. Cichlids (single fish): 1, Firemouth, A. Lang; 2, Brown Acara, A. Young; 3, Blue Acara, A. Lang. Tropical Catfish, Loaches and Sharks: 1, Indian Catfish, A. M. Patrick; 2, Bronze Catfish, A. Cross; 3, Talking Catfish, K. A. M. Robertson. A.O.V. (Adult size 2½ in. or less): 1, Glass Fish, J. Low. A.O.V. (Adult size more than 2½ in.): 1, Australian Rainbow Fish, A. Watt. Breeder's Class, Coldwater: 1, Shubunkins, J. H. Hood and H. R. Gibson; 2, Shubunkins, J. H. Hood and H. R. Gibson; 3, Shubunkins, J. H. Hood and H. R. Gibson. Breeder's Class, Tropical Livebearers: 1, Gold Scaletail Guppy, H. Kerr; 2, Black Veiltail Guppy, Dundee Aquarist Society; 3, Yellow Wagtail Platy, S. Naimith. Breeder's Class, Tropical Egg-layer: 1, Apistogramma Ramirez, Dundee Aquarist Society; 2, Aphysemion Callisura, I. M. Walker; 3, Glowlight Tetra, E. R. MacDonald. Coldwater Furnished Aquarium: 1, K. A. M. Robertson; 2, A. Young; 3, Wm. Reid. Tropical Furnished Aquarium: 1, A. T. M. Robertson; 2, A. Hamilton; 3, K. A. M. Robertson. Junior Tropical Furnished Aquarium: 1, I. Wylie; 2, A. Sweeney; 3, J. A. Rodger. Junior Coldwater Furnished



### The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. 6d. together with the **Aquarist's Badge Token** cut from page xiv, to Aquarist's Badge, *The Aquarist*, The Burs, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.



Aquarium: 1, A. Young, Jr.; 2, J. S. Young; 3, A. Wellins. Schools' Furnished Aquarium: 1, Bellshovston Senior Secondary School; 2, St. Bernard's Secondary School; 3, Clifton High School. Clubs' Coldwater Furnished Aquarium: 1, Greenock and District Aquarist Society. Clubs' Tropical Furnished Aquarium: 1, Greenock and District Aquarist Society; 2, Edinburgh Aquarist Society; 3, Alloa and District Aquarist Society. Reptiles and Amphibia: 1, Marbled Newt, L. Thompson; 2, Green Lizard, A. M. Patrick; 3, European Terrapin, J. H. Hood and H. R. Gibson.

**AT THE Mansfield and District Aquarists' Society's** meeting the speaker was Mr. H. Gentle, specialist breeder of the Shubunkin for many years, and his subject was the "Goldfish."

At the same meeting Dr. D. Porter was presented with two "Shed" diplomas awarded at the recent H.A.F. (Manchester), and a plaque for the best goldfish in the evening's table show was awarded to Mr. B. Parkin for his entry of a fine fantail goldfish.

**AN enthusiastic gathering of the Lanes Section, F.G.H.S.,** was held recently at their new headquarters, Ivy House, Bolton Road, Pennington, Nr. Manchester (Near The Woodcock Hotel). A cordial invitation is extended to all fishkeepers, 2.30 p.m., the first Sunday in each month to go along and enjoy the company of enthusiastic Guppy Breeders.

**THREE clubs** competed for the Hall Trophy at the headquarters of the **Riverside Aquarist Society** recently and the winning club was Slough with Riverside second and Uxbridge third. It was a very keenly fought match, with only a few points between the clubs, and the evening continued with a general discussion on fishkeeping. Riverside are still after new members, and anybody interested, would they please phone Mr. J. Howe, CHL 1145.

**THE Aquarium Circle, of Sydenham** who have recently acquired new headquarters in the district have much in common for the newcomer to the hobby in their future programme, which incorporates several well known Lecturers and independent discussions and shows.

The layman who intends to take up the hobby, can be sure of expert attention on introduction to the many fields of interest that lie ahead, whether young or old.

General meetings are held on the 1st and 3rd Wednesdays of every month at All Saints Hall, Thersbury Road, Sydenham, S.E. 26, at 8 p.m.

Application forms may be obtained in advance, from the secretary, Mr. E. A. Shaul, 54, Valentine Court, Perry Vale, Forest Hill, S.E. 23.

**THE annual general meeting of the Thurrock A.S.,** was held recently and the following members now hold office for the coming year. Mr. R. Nicholls, chairman; Mr. F. G. Elford, secretary, 28, King Street, Gravesend, Kent; Mrs. R. Nicholls, treasurer; Mr. W. Felton, show secretary; librarian and publicity officer, Mr. H. Porter; committee man, Mr. S. Wellman. The chairman, Mr. Nicholls then presented to Mr. D. Strudwick the Swanbury Shield, awarded each year to the member obtaining most points at club and inter-club table shows. Mr. S. Wellman, was awarded the George Driver Cup for most points in the Home Aquaria Competitions. Meetings are held every alternate Monday at the White Hart Hotel, Old High Street, Grays, Essex and anyone wishing to attend can be assured of a very hearty welcome.

**THE past year** has been a full and successful year for the **Erith and District Aquarist Society.** Many new members including several enthusiastic youngsters have been enrolled. The monthly table shows have been well supported and the competition unusually keen. During the year members have enjoyed talks by Mrs. W. Meadows, Mr. J. Vesper and the chairman, Mr. E. Quick. Two film shows,

although not directly concerned with the hobby, did help to quench insatiable appetites for all piscine facts.

An extremely successful "advertising campaign" in the form of a show was staged in the local department store. The Society is pleased to observe that former secretary Mr. G. Baker is at last having the success he deserves with his ventral guppies.

**OFFICERS** elected at the annual general meeting of the **Yeovil and District Aquarist Society** were as follows: President: Mr. J. A. Dixon; chairman: Mr. N. Stainer; vice-chairman: Mr. M. Goscott; secretary: H. G. E. Aston, 100 Larkhill Road, Yeovil; treasurer: T. Perry; show manager: B. Stidson. Reports were unanimous for a good working year in which the exhibition displayed at the Bath and West Agricultural Show made an able contribution to the financial status of the society.

**MEMBERS** and friends of the **Independent Aquarists' Society** enjoyed an entertaining evening with a film show, which included "Coral Wonderland" and also "Full Fathom Five" dealing with fish and underwater survey work.

On the 14th December there will be a film show with a film called "The adventures of White Spot" followed by a social—all "fish minded" welcomed. New members welcome. The Society meets 8 p.m. on Monday evenings, at the Islington Men's Evening Institute, Monsem School, Room 12, Upper Hornsey Road, Holloway, London, N.7.

**THE annual general meeting of the National Aquarists' Society** was held recently when the following officers were elected, President: A. Beyden; vice-president: L. Katters; secretary: E. H. Mann, 63, Whitearch Avenue, Edgeware, Middx.; Assistant secretary and librarian: H. Hartridge; treasurer: D. Armstrong; Council: P. Mead, A. Wilson, Mrs. I. Katters, W. Hoop, F. Stone, J. E. Searle, A. Osborne. Bulletin editor: Mr. G. Hervey.

The Society will meet at the New Horticultural Hall, Vincent Square, Westminster, S.W.1, on the second Monday of each month during 1960 and new members are welcome.

**AT the Bristol Aquarists' Society's** annual show there were 33 classes. The best fish in the show was a red-tailed scaled veiltail owned by Mr. N. O. Grimston and the other winners were as follows: Goldfish, L. Phillips; Bristol shubunkins, 3 in. limit, W. Hicks; shubunkins, over 3 in., W. Hicks; Veiltails, N. O. Grimston; Moors, P. J. Upchurch.

Telescopes, Orandas, Lionheads, Celestials, Bubble-eyes, D. S. Paul; Nymphs and Comets, P. J. Upchurch; Fantails, scaled, N. O. Grimston; Fantails, calico, G. Harper; A.O.V. pond or river fish, S. J. Davis; Bristol shubunkins, bred 1959, H. J. Whiting; Moors, bred 1959, N. O. Grimston; A.O.V. fancy fish, bred 1959, H. V. Jenkins; breeders' class, W. Hicks; breeders' class two, N. O. Grimston; Bristol shubunkins, matched pair, L. G. Emery; furnished aquaria, coldwater, S. J. Davis; aquaria, tropical, Mrs. I. M. Stone; aquaria, inter-club, B. A. S. Keynsham branch.

Aquatic plants, coldwater, S. J. Davis; aquatic plants, tropical, L. E. Challenger; Fighting fish, H. Rundle; Labyrinth, F. A. Mould; Barbs, L. E. Challenger; Characins, G. Stone; Cichlids, Mr. Scott-Morgan; A.O.V. egglayer, F. Brown; Mollies, H. Rundle; Guppies—(a) short tail, L. E. Challenger, (b) long tail, J. Wheeler, (c) female, J. Wheeler; Platies, Mr. Scott-Morgan; tropical breeders' class, team of six fish of one variety, H. Rundle; tropical breeders' class, egglayers, six of one variety, Mr. Scott-Morgan.

**AT the Brockley and District Breeders' Circle (Aquaria Society)** meeting and table show, specimens which had won awards at previous table shows were barred on this occasion, so some entries were especially treated "also rans." Special Foods, changes in water

and heat, are some of the tricks used to better the condition of specimens—and show a member's ability as an aquarist.

The winning entry came from the same stable as the winner of a recent "breeders' class" table show, a husband and wife team from Lewisham, Mr. and Mrs. S. Shield. Mrs. Shield's Black Mollie received 80 points out of a possible 100, and this was closely followed by Mr. T. Thomas's Tiger Barb and Mr. Hicks's Dwarf Cichlid.

While the entries were being judged a brains trust was formed from among the more experienced aquarists, and they answered questions put by other members. During the evening the "medical member" Craig Barnett, put forward a scheme for testing the colour-consciousness of fish, and at least one member has decided to carry out controlled experiments on these lines.

**MILLIONS** of goldfish swam to freedom, their death or the waiting nets of hundreds of small boys in Yamatokozuyama, Western Japan, when rain from a passing typhoon flooded cultivation ponds in the city.

The Goldfish Cultivator's Mutual Aid Association in the city said about 10 million goldfish out of the 70 million in the ponds escaped.

Children woke the morning after the typhoon to find the city's streams filled with schools of goldfish.

**AMONG** recent activities of the **Bradford and District Aquarists' Society** there has been a display of colour transparencies of Tropical Fish by Mr. Penquilly of Burnley and also the annual dinner. The present leaders in the table show competition are Mr. A. E. Thornley with 25 points with Mr. A. W. Whitfield and Mr. C. R. Wilson dead-heating for second place with 21 points.

**A VISIT** to Blackpool Tower Aquarium, a slide show and accompanying talk by Mr. L. Connell and the second round of an Inter-Club Show have all featured in the **Mersyside Aquarist Society** programme recently. The other contestants in the Inter-Club competition are Southport and Wirral.

**THERE** is a change in the meeting date of the **Oswan Aquarist Society.** The meetings are now to be held on the first and third Wednesday of each month.

#### SECRETARY CHANGE

**A CHANGE** of secretary has been reported from Hounslow and District Aquarist Society: Mr. D. J. Woodward, 16, Illeridine Road, Hounslow, Middx. Telephone: Isleworth 5918.

### Crossword Solution

W	A	T	E	R	G	A	R	D	E	N	S
A	I	R	T	E	O	N	E	T			
T	R	I	C	H	O	G	A	S	T	E	R
E			E		A	C	H	E		A	
R	I	V	L	U	S	H	A	R	T	I	
L	M	N	I		N	O	N				
O	P	H	I	O	L	O	G	I	S	T	S
B	O	C	E	A	N	P					
E	C	T	O	P	A	R	A	S	I	T	E
L	E	R	I		T	I	N		F		
I	L	L	N	E	S	S					
A	L	S	R		T	H	E	S	I	S	

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