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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



In this issue:

The Clown Loach

Terror of the Rock Pool

THE AQUARIST AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

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goldfish varieties

Part 6

A series of six articles
by Frank Orme

AS STATED in the first of this series of articles, which appeared in the April issue of this magazine, the goldfish originated in China around 1,000 years ago. It was there that many of the fancy varieties were created, especially during the Ming Dynasty, and it is claimed that Emperor Hsuan-tsung (1426-1435) was the first great connoisseur. During the period of the old imperial system, aristocrats of the court and provincial lords secretly kept and raised the "Imperial heirlooms" in their own homes. It seems that the accomplishments of those early goldfish breeders was limited only by the scope of their imagination. Through the most patient efforts, not only of a lifetime, but of generations of a family, they created such great changes in form and colour that many varieties do not seem to even distantly resemble the common goldfish. Some, such as the telescope-eyed varieties, suggest the Chinese love of the grotesque, for they bear a strong resemblance to Chinese art. Nowadays the Chinese continue to raise the goldfish and endeavour to create new varieties, but this work is no longer the province of the small establishment. Most goldfish breeding is carried out at various large parks, where the attendants are responsible for caring for, breeding and raising, the goldfish varieties. These are publicly displayed in pools and large vats and generally attract a great deal of interest from visitors.

A Chinese booklet lists their most popular varieties as follows: Wu-hua meaning Floral; this is equivalent to our macrourous group. Apart from the

normal Floral colours, the Wu-hua is also available with a red body which is spotted with green, or a blue body with red spots. Kao-t'ou meaning High-head; we know this fish as the oranda. Lung-ching meaning Dragon-eyes, our telescope-eyed type. Hung-ting, or red-cap. The veiltail type red-cap. E-t'ou-hung meaning Goosehead with red-cap. A lionhead type with a silvery-white body and a red cap. Wang-t'ien-tai-ch'ou meaning Sky-gazer playing ball, a type of celestial goldfish with pom-poms. Shih-tzu-kun-hsiu-chiu meaning Lion playing brocade ball, in other words a lionhead with large pom-poms. Jung-ch'ou meaning Brocade ball. The pom-pom. Wu-hua-tan-feng meaning Floral Phoenix, the macrourous phoenix. Shui-p'ao-yen meaning Watery puffed eyes. The bubble-eye. Chen-chu-lin meaning scaled with pearl-like beads. The pearlscale. Hung-kao-t'ou meaning Red with high head. The oranda. Shih-tzu-t'ou meaning Lion-headed. The well known lionhead.

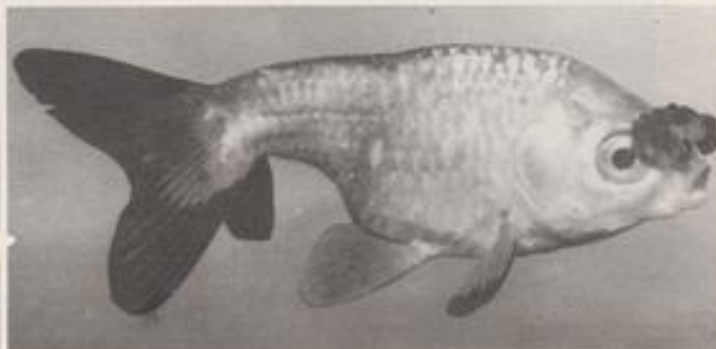
As will be realised, some of these Chinese varieties combine features of more than one form of fancy goldfish and would not, therefore, be considered as a 'pure' variety by British aquarists, although, in truth, the same could be said of some of our own recognised varieties!

The Japanese imported goldfish from China sometime around 1500 AD., as pets for the aristocracy. Due to the high cost and scarcity of available stock, the common people could not keep these fish. In fact, they were forbidden to do so, for the goldfish was considered far too regal for the common people. The Shoguns, or military governors, strictly enforced the ruling so that it was not until about 1824 that, finally, it was accepted that anyone who wished could keep goldfish. Over the years the Japanese developed a number of varieties which revealed their natural appreciation of elegance and grace. Amongst the various varieties produced by present-day Japanese breeders can be listed the Ryukin, Wakin, Jikin, Tosa-kin, Oranda, Ranchu (lionhead), Shubunkin to name just a few. Apart from those who breed commercially, there are small, family establishments, where generations of fathers have handed down their skills, in the cultivation of goldfish to their sons.

Every year large numbers of the more commercial varieties of goldfish are imported into this country, from the Orient and other Eastern countries. Similarly, in the U.S.A., (where the comet and veiltail were developed), there are a number of large commercial fish farms which export goldfish to our dealers.

In my opinion, however, most of the stock bred and raised in this country is superior to any of the generally imported varieties. The reason is not hard to find: it is quite simply that the majority of British-bred stock is raised by amateur goldfish breeders. Few

Pom Pon Goldfish



THE AQUARIST



Lionhead

amateurs have sufficient space to raise huge numbers of young from a number of different varieties, therefore they specialise. In general, only one or two varieties are kept. The adults are chosen with care and are more often than not, the result of a planned system of line-breeding. The young are subjected to strict and regular culling in order that only the best progeny are grown on. In addition, most goldfish breeders have a particular standard which they work to, (show standards are not only used by exhibitors), and this provides a type to breed for. It is this breeding and selection for quality, rather than quantity, that makes British-bred varieties generally superior to the imported specimens. There is, of course, another benefit in favour of the home produced fish—it does not have to endure the stresses to which an imported fish has been subjected, nor does it require too much adjustment to become acclimatized to its new home. Against this in most instances the home-bred fish will be much more expensive than its imported counterpart.

Not all goldfish, especially those of the more exotic types, offered by the trade are imported. There are a number of dealers who specialise in coldwater fish, who purchase stocks of the various British-bred goldfish varieties in order to satisfy their more knowledgeable customers. Indeed, many enthusiasts will travel considerable distances to obtain young, good quality fish from a particular breeder of the variety in which they are interested.

New varieties arise either through natural mutation or from deliberate cross breeding of different varieties. In the latter case the breeder has a

definite idea of what the envisaged new variety should look like. However the new variety arises, it cannot be truly claimed as a new variety unless it differs, in some way, to any other variety and has been consistently produced over a number of years and thereby become established as a new type. In this context it should be pointed out that it takes many years of breeding home-produced fish before a strain can be described as a British strain. Even the third generation of fish from original imported fish are really better described as 'British bred,' for there has not been sufficient time for the strain to be well founded and established.

Possibly the greatest difference between Chinese, Japanese and British methods of goldfish production lies, in general, in the varied approach adopted by each country. China, it appears, concentrates upon the production of new varieties of goldfish, and has proved most successful. Not only have the Chinese produced new body, head, eye and finnage features, they have also produced new colour features such as the brown, blue and purple metallic scaled types. They also produce a black metallic bubble-eye goldfish. The Japanese, on the other hand, produce very few new varieties. Instead they prefer to take the best of the Chinese varieties and concentrate upon 'fixing' the particular feature and moulding it to conform to their own tastes. In both instances, fish bred in both countries are mostly intended for viewing from above, as when swimming in a pool, thus the fin shape and amount of colour on the dorsal region of the

Celestial



fish is of greater importance than some other aspects of the fish.

The British hobbyist prefers to keep the more exotic varieties in glass aquariums, where they can be viewed from all angles. For this reason we prefer the colour to be evident on all areas of the body, and often spreading into the fins, body shape also assumes great importance. Not only is the shape of the finnage important, but equally its carriage and placement. Unlike the Orientals, the average British enthusiast tends to be more conservative in the choice of goldfish varieties, with no great liking for the



Bubble-Eye

more bizarre types, and therefore fewer find general acceptance. Over the years some varieties have found lasting favour, and these have been bred, and improved, to meet our own ideas of what constitutes the best features of each variety. The various show standards are drawn up with the same aim in mind, they depict what is considered to be the ideal British goldfish varieties. Due to these different approaches, each country produces a different style of fish for the same varieties each, possibly, reflecting to some degree each nation's own idea of an attractive fancy goldfish.

SPOTLIGHT

THE GLASS CHARACIN by R. Zukal

Prionobrama filigera

Called by German aquarists, the Glass Characin, this fish is elongated in form, transparent as a piece of glass, light-grey, shimmering light-blue to greenish when caught by the light. In sharp contrast to its overall coloration is its blood-red caudal peduncle. The leading rays of the relatively large anal fin are, in adult fish, drawn out in a filiform fashion, with the leading edge of the fin off-white or white.

These characins were first imported to Europe in 1931 from the Rio Madeira basin, but were not bred. Although it is a highly attractive, elegant and fast-swimming fish, which grows up to 6 cm, and is a peaceable shoaling fish, we have not been able to see it in our aquaria until the last three years. Since its behaviour and reproduction is very similar to the well-known *Aphyocharax anisitsi* and other characins which are not difficult to keep, it is difficult to say why we have not seen this fish before. Probably, it was imported again in recent times and all the fish now seen are descendants from those introduced then, because not until the last two years has the fish been bred in sufficient numbers to bolster

the hope that from now on it will become, and remain, an attractive addition to many aquaria.

In general, these are undemanding fish, a water temperature of 22-24°C, a medium-sized, preferably longish, well-planted but not crowded tank, normal tap water which has been left to stand, create suitable conditions for them. They feel at home in a shoal of their fellows or in the company of peaceable, smaller characins, but only with fish which do not need soft and acid water. In medium-hard and neutral to slightly alkaline water they are quite happy. They are omnivorous and in no way selective.

In order to breed the fish one should choose a tank which is not too small. They spawn mostly in the upper water layers, so fine-leaved plants are placed at the water surface as well as the tank bottom. Plants are used the roots of which hang down freely, such as *Ceratopteris pteroides*. For breeding too, ordinary tapwater is used and it is not necessary to change the water by adding chemicals or in some other way. It should merely be neutral, slightly alkaline, not soft and 26°C. I have

always introduced a breeding pair in the evening and if the fish did not spawn within 48 hours, an additional male was introduced. The female does not in fact spawn with two males, but the second male awakens rivalry in the first and as a result he becomes more active.

Differences between adult fish of different sexes are immediately recognizable. The male is somewhat smaller, slimmer; the female has a fuller abdomen; according to Dr. Frank the first few white rays of the anal fin are usually much more elongated in the female than in the male. As soon as the fish have been introduced to the spawning tank and have settled down, the female is the first to take command. Whenever the male approaches her he is energetically rebuffed. However, as soon as the male is in the right frame of mind for spawning she mends her ways. The female is chased, rammed in the abdomen and enticed into the plants. As soon as the fish are stimulated, they press against each other and in a lightning fast turn they spawn. Spawning proceeds for about two hours and is very turbulent, so the tank must be covered with a sheet of glass. 200 to 400 crystal-clear eggs are extruded only some of which remain hanging from the plants. After spawning the fish must be removed, otherwise the greater part of the eggs will be decimated. The young hatch after about 24 hours and hang from the plants and the sides of the tank until they are free-swimming. At that stage they must be given the finest food. One can also feed them carefully with hatched brine shrimps. The young grow quite quickly and are sexually mature within six months.



In 1915 centenary year, Charles Darwin would be astonished at what is happening on the Galapagos Islands which stimulated his work on evolution. The islands are overpopulated with tourists. The few remaining giant tortoises for which the islands are named have retreated up the moist slopes of volcanoes, their numbers maintained by breeding in captivity and releasing when old enough to fend for themselves. The lava-lizard and the marine iguana are likewise troubled by a population of people increased to 5,000 on 4 of the 13 islands. The Ecuadorean government limited access this year to 25,000 visitors and 3 cruise-ships. But while it talks conservation, it permits commercial tourism to expand so much so that a marine fisheries expert resigned from Instituto Nacional de Galapagos saying (I quote the Boston 'Monitor' of April 26): "I am not prepared to defend ecologically orientated politics which are a pretext for development." Yet it was Darwin who started it all, unknowingly, when he focused world interest on the islands.

Poisonous snakes

How many poisonous snakes glide their scaly way in Europe? Six or seven vipers in southern and south-eastern Europe are dangerous to man though the poisonous Balkans cat-snake, Montpellier's snake of the Mediterranean coast and the Balearic false smooth snake are unlikely to kill man. But a recently published new Penguin paperback sent to me for review, Judy Urquhart's 396-page *Living off the Land* (£5.95) states "In Europe the only snake whose bite is poisonous is the Adder." More often quoted than experienced, its collections of wild foods and other "back to nature" clippings refers to "the com-



by Eric Hardy

mon frog, introduced here by the Romans." She calls the common rush *Scirpus lacustris* which is true bulrush, whereas soft rush, *Juncus efusus*, is the commonest rush with us. A lamprey is said to "look like a cross between an eel and a fish," as if an eel weren't a fish, and it's rather startling to read that roach are "found in all types of water up to 3,000 ft."

Extinction

Is life coming or going on Earth? Is the future really so bleak? Numerous books on conservation and endangered species have appeared, mostly repeating what is already in print elsewhere. An exceptionally informative and original approach to the subject is the new English edition of Prof Paul and Anne Ehrellich's American book *Extinction*, the causes and consequences of disappearing species (Gollancz £9.95). Its 305 pages of solid text without illustrations give a

most up-to-date background of ecology and evolution, full of examples as Darwin would have written, and the natural and artificial conditions which cause extinctions. Paul Ehrellich, a professor of biology at Stanford University, is rather ruthless on aquarists and the market in zoos for evaders of protective laws. In 1970 nearly 84 million living fishes were imported into the U.S.A. and by 1979 it increased to about 250 million. Many were coral-reef fishes. Over two million reptiles were legally imported in 1970, and the number doubled by 1979, mostly to zoos, some to private trade. Eight top zoos were identified as buyers of illegally imported reptiles while poaching rare Arizona ridge-nosed rattled snakes "is becoming something of a cottage industry." I mentioned a few years ago illegal trading in smooth snakes in southern England. Ehrellich states it is still collected and offered for sale in pet shops here. Where? But he also points out that the butterfly and damsel coral-fishes of Hawaii's Kaneohe Bay were not decimated by hungry fishermen or commercial collectors for the saltwater aquarium trade, but by man's effects on the ecology of the reef by the sewage from tourist developments, and by rain flood-silts suffocating the coral due to lack of erosion-control. Worse, he relates damage by academic Californian scientific expeditions destroying Galapagos tortoises.

He made a special study of these butterfly-fish which, unlike those in competition with more damselfish in the Australia barrier reef, move upward in dazzling abundance as they feed on plankton far from the protection of the coral. This is particularly noticeable with bright Lemon Butterfly fish in the Molokini marine reserve off the Maui coast.

Naturalist's Notebook

Sex changes

Female salmon converted to males by hormone treatment produce all female offspring. Crosses with sex-reversed males produce 50% all female broods. Only sterile female hybrids are produced by crossing female turbot with male brill. The reverse mating, female brill with male turbot, produce male or female hybrids. These are examples of some of the interesting work by

Ministry biologists related in MAFF's 90-page report on Fisheries Research, 1977-80, sent to me by the Director of Fisheries Research at Lowestoft.

By controlling light, turbot which normally spawn in mid-summer, so inconvenient for fish-farming, have begun spawning in February when kept at 7 to 13°C. in an 18-hour day from November. Kept in a 6-hour day length until July, they delayed spawning until November. Internally-illuminated vessels improved the production of algae for rearing oyster-spat

at their Conway laboratories. Using acoustic tags showed that migrating plaice used tides for transport, coming into mid-water on one tide and going down to the bottom on the next. TV equipment and infra-red lighting are used to observe salmon ascending and descending the North Esk at Kinnaber weir. They conclude that introduced Chinese grass-carp will not clear all water-weeds and will have to be used in conjunction with other methods, including herbicides.

BOOK REVIEW

Afrikanische Cichliden

I *Buntbarsche aus Westafrika*—Horst Linke—Wolfgang Staeck

II *Buntbarsche aus Ostafrika*—Wolfgang Staeck—Horst Linke.

These two short, 140 pages each, beautifully produced hardback books are a welcome addition to the current cichlid literature, and Tetra are to be congratulated on sponsoring their publication. In view of Tetra's involvement, it is to be hoped that for the first time, English translations will become available of authoritative German texts.

To take the two books separately, the first volume, on West African cichlids is by far the most comprehensive and thorough treatise on the very much underrated and beautiful cichlids from this part of the world that I have seen (I have not seen Mayland's "*Buntbarsche Ost-und Westafrika*").

There are in-depth discussions and distribution maps for virtually every species found in African fish regions 3, 4 and 5. In addition to the taxonomic species, there is discussion and colour photographs of many of the colour varieties within the species. The most interesting thing is the tying-up of

colour forms to geographical locations, together with an analysis of water conditions in the area the fish were found. For example the 'Mungo' form of *Chromidotilapia finleyi* is found in the Mungo River, West Cameroon, at a water pH of 7.6 total hardness 3 GH (51 ppm) and carbonate hardness of 2 KH (34 ppm), the water being slightly turbid and muddy in colour, whereas the 'Campo' form from South West Cameroon is found in very clear, brown water at a pH of 4.8 and no detectable hardness. Of course, how much these differences in water chemistry may be seasonal is not revealed, but it vividly illustrates the point that there is no 'blanket' water condition, particularly in riverine systems.

While the coverage of *Hemichromis*, *Nanochromis*, *Steatocranus* and *Pelvicachromis* is comprehensive, I was disappointed that the coverage of the West African tilapines is so poor, with only *Tilapia bananana*, *Tilapia buttikoferi* and *Tilapia joko* being discussed.

While I am not in a position to comment on the accuracy of the identification of the fishes in the photographs, I respect Horst Linke's thoroughness in assembling this worthwhile catalogue.

By contrast, the second volume is entirely different in approach and content. After all, having dealt with just 58 species in the first volume, how do you then deal with over ten times that number in the same number of pages? The solution adopted by

Wolfgang Staeck is to pick and choose the species covered. In a situation where personal choice enters, there are bound to be arguments for and against those chosen. Personally, I found the choice somewhat strange, and not particularly representative considering that the book is called "East African Cichlids" not "Rift Lake Cichlids", the problem being that while the fish covered are currently popular and available, they may not always be so, so the book could suffer from premature 'obsolescence'.

However, each of the 52 species that are covered are dealt with in considerable detail. There are only three non-Rift Lake species, *Sarotherodon mossambicus*, *Pseudocrenilabrus philander dispersus*, and *Haplochromis obliquens*, the only fish dealt with from Lake Victoria.

Notwithstanding the above comments, this book makes a fascinating introduction to the fishes of Lakes Malawi and Tanganyika, further coverage of which could be found by the dedicated in Staeck's now sadly out-of-date, but very useful, two volume work "Cichliden, Verhalten, Verbreitung, Arten" or Mayland's "Cichliden und Fischzucht".

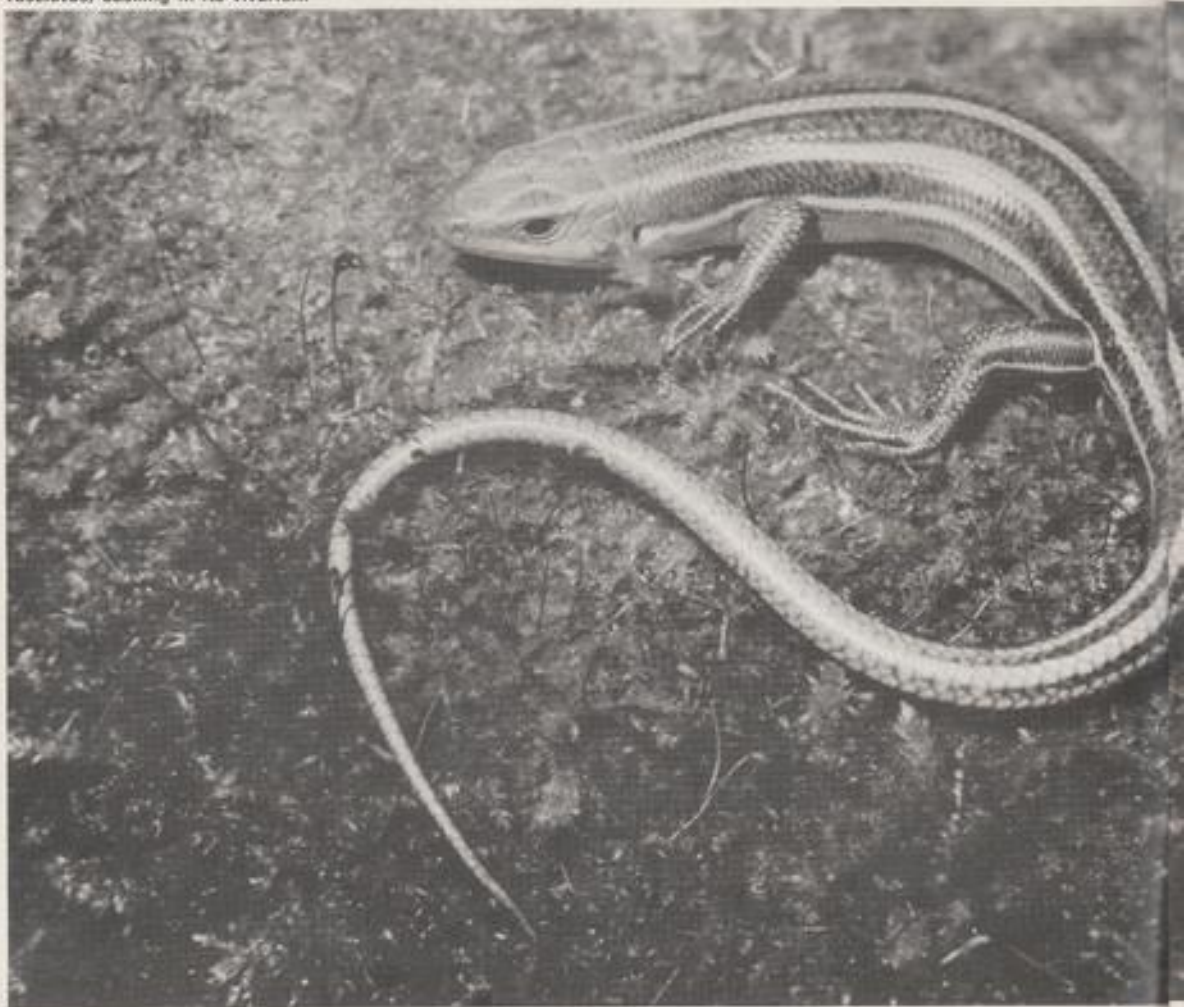
Although no price is given for these books, they would represent very good value for money at anything up to £5 each, in view of their excellent print quality and the depth of study without being overbearingly technical. How about that English translation Tetra?

Ian C Sellick

THE BLUE-TAILED SKINKS

by Chris Mattison

A male Five-lined Skink, *Eumeces fasciatus*, basking in its vivarium



THE SKINKS form a large and widespread family of lizards—over 600 species—occurring on every continent. Many are very common within their ranges and most are easily cared for, making them good subjects for the vivarium. Of a fairly limited number occurring on the North American continent, most belong to the genus *Eumeces*, and several of these are notable for having bright blue tails when young. The purpose of this coloration is to distract the attention of predators away from the head; if grasped, the tail is discarded and the skink can escape.



My first experience with this group of lizards was many years ago when I kept a small group of Western Blue-tailed Skinks, *Eumeces skiltonianus*. These impressed me with their liveliness and undemanding disposition, and more recently I was able to renew my acquaintance with their clan when an eastern form, *E. fasciatus*, usually known as the Five-lined Skink, became available.

Despite their collective wide range across North America, all of these skinks like plenty of ground cover and may be found amongst leaf-litter in woodlands, rotting logs and stumps or, in the more arid regions, amongst dead cacti, brushwood, etc., where they hunt for their food, consisting of spiders, insects and other invertebrates. Some moisture is essential and in captivity an occasional light spraying is appreciated. An ideal arrangement consists of an inch or two of leaf mould, covered with dead leaves, small flat stones or pieces of bark. The top layer should be encouraged to dry out completely after spraying, so good ventilation is essential, and a light bulb or spotlight should be located at one end of the cage to give a temperature of about 30°C immediately beneath it. Shady, and therefore cooler, conditions should be available at the other end where a plant or two (ferns, ivy, etc.) can be situated for decoration.

The light must be turned out at night, allowing the overall temperature to fall. 15°C should be regarded as a minimum unless the animals are to be hibernated—the advisability of this will depend on the species' origin. The eastern forms in particular would seem to be good candidates for a protected outdoor enclosure such as

a modified garden frame, although I have not yet had an opportunity to test my theory.

Breeding should present no problems, either indoors or out, provided the animals are healthy and conditions are to their liking. In all the species, the males have larger and more powerful heads, and sometimes their chin and throat is tinged with orange, especially during the breeding season (spring). Also, the females usually retain a certain amount of blue colouring on their tails, whereas the males invariably lose this by the time they mature. Female Blue-tailed Skinks lay a small clutch of eggs beneath a piece of bark or stone and coil around them during their incubation—an unusual case of parental care in reptiles. The babies measure about 2 in. at hatching and have unbelievably brilliant tails. Rearing them is quite easy, the most convenient food being flies and young crickets, and small insects collected in the garden. If a vitamin + mineral powder is added to every alternate feed, lack of sunlight does not appear to be detrimental to their health.

Table 1. Blue-tailed Skinks—summary of species.

Species	Common name	Size (cm)	Approximate range
<i>E. fasciatus</i>	Five-lined Skink	5-7	Eastern N. Am.
<i>E. gilberti</i> *	Gilbert's Skink	6-10	Western N. Am.
<i>E. inexpectatus</i>	South-eastern Five-lined Skink	5-7	Eastern N. Am.
<i>E. laticeps</i>	Broad-headed Skink	8-13	Eastern N. Am.
<i>E. multicinctus</i>	Many-lined Skink	5-7	Central N. Am.
<i>E. obsoletus</i>	Great Plains Skink	7-12	Central N. Am.
<i>E. septentrionalis</i>	Prairie Skink	5-7	Central N. Am.
<i>E. skiltonianus</i>	Western Blue-tailed Skink	5-8	Western N. Am.

**E. gilberti*. Only some of the subspecies of this skink have blue tails.

BOOK REVIEW

Nishikigoi Fancy Koi (Second edition) by Takehiko Tamaki. Published by Tamaki Yogyoen, Japan. £8.95.

In addition to the Koi books reviewed in the August issue, there is also the second edition of "Nishikigoi Fancy Koi" by Takehiko Tamaki published in 1977. This is in paperback form and supersedes the original 1974 version.

Mr. Tamaki, a noted Koi-breeder and exporter in Hiroshima, visited the UK in 1976 and after discussing the problems of keeping Koi in our

cooler and more variable climate (not really appreciated in Japan), he included some realistic advice on



the winter care of Koi more applicable to our conditions.

This 120 page book is a moderately complete reference on Koi and has chapters devoted to the classification of varieties, buying, handling, feeding and showing, as well as fully illustrating prevalent diseases together with their diagnosis and treatment.

The construction of ponds and filters is also dealt with and provides some guide-lines.

Generally, this book is already recognised as a useful work at the sensible price of £8.95 and can be recommended to both beginners and the more experienced Koi-keepers. It is available from most Water Garden Centres and Koi suppliers.

Hilda Allen



New deal for aquarists

I am writing to bring to the attention of clubs and individuals a new organisation which has been formed in the Southern part of England, called the **Association of Aquarists**

It was brought about by many experienced aquarists in the South feeling that a better service and more harmony is required by clubs to give them a new impetus. A Judges and Lecturers list is available, as is a copy of the Association Rules which are few, I hasten to add.

Societies, we feel, have been getting a poor service of recent years, and we hope this new organisation will encourage a more active part in the hobby

on the part of individuals and fish clubs everywhere.

We will encourage active participation with specialist societies, i.e. Catfish, Livebearers, Goldfish, etc. and we hope their professionalism will be of value where needed.

Clubs may affiliate and we will also accept individual members as well. Subscriptions will be small and we hope to produce a Newsletter on a regular basis to keep members informed of News and Current Events within the hobby and to contain suitable articles by guest writers on their chosen subjects.

Your interest will be appreciated, so for details contact:

**Secretary,
Association of Aquarists,
7 Wheeler Court,
Plough Road, Battersea,
London S.W.11.**

Remember, bring the fun back to fishkeeping and join the hobbyist in the **Association of Aquarists** and get back in the swim!

ADRIAN BLAKE,
Basingstoke.

Rearing Marine Fry

With reference to the article by Dr. Robert J. Goldstein, Ph.D. in *Aquarist & Pondkeeper*, June 1982 page 56-60 on how to raise marine fish larvae.

I think that some of your readers may be interested to know of a company which specialises in the production of live algae and rotifer culture kits for the specific purpose of rearing marine fish fry.

The company is run by Paul West, B.Sc. Mar/Zoo and Andrew Anderson and they can be contacted at the following address: New Aquaculture Ltd., P.O. Box 18, Oban PA34 4LA, Argyll, Scotland or telephone 0631 64730 between 6 and 7 p.m. any evening.

The kits are supplied with very easy to follow instruction leaflets giving written step by step details and also drawings of how to set up and grow the cultures.

They also supply plankton collectors as mentioned in Dr. Goldstein's article.

Also available for £2 including
Continued on page 35

TERROR OF THE ROCK POOL

by Andy Horton

Viewed from above in its natural habitat the Sea Scorpion can easily be mistaken for a rock. The mottled brown and cream colour patterns render this fish almost invisible within the algae encrusted pools of the British coastal region.

A prawn dances gracefully over the floor of a seaside rock pool, skirting the fronds of caragheen, its long tentacles feeling ahead cautiously. Two large eyes revolve within their sockets. The unsuspecting prawn ventures closer. Attention! The rock moves, dorsal fins stiffened to maintain equilibrium, rushing headlong from its lair; a large expandable mouth closes over the unfortunate victim. Two long tentacles protrude from the immense jaws.

The Sea Scorpion *Taurulus bubalis* is an extremely voracious predator with a marked taste for prawns and small fish. A veritable terror of the rock pools. A rapacious hunter that camouflages itself amongst the rocks and captures its prey with one enormous gulp from its gigantic mouth. It is capable of capturing fish even larger than itself digesting its own weight in food, in only 50 minutes.

Hidden amongst the weed growths of intertidal pools or stealthfully haunting the shallow seas, the Sea Scorpion will remain motionless for hours. This is not surprising. In common with the rest of the family *Cottidae*—the fish has no swim bladder. When it ceases to swim, it sinks to the sea bed. Cottids, or Bullheads, as they are widely and aptly known, are characterized by an ugly flattened head, very large and wide, that in substance is equal to the remainder of their tapering bodies. The Sea Scorpion is the commonest of the family, found on rocky and weed strewn marine habitats in the immediate vicinity of the shore.

Two other fish of the family are found in British coastal waters. The Bull Rout *Myoxocephalus scorpius* is larger and lives in slightly deeper water. The Norway Bullhead, *Taurulus liljeborgi* is classified in the same genus. It is smaller, found on Scottish coasts, and not nearly as common. Female Sea Scorpions attain a maximum length of 18cm, the males only 15 cm. The three fishes are difficult to differentiate. The Sea Scorpion has at least four spines on its front gill cover, the two uppermost exceed the diameter of its eye. Discerning readers are advised to refer to a specialised text.¹

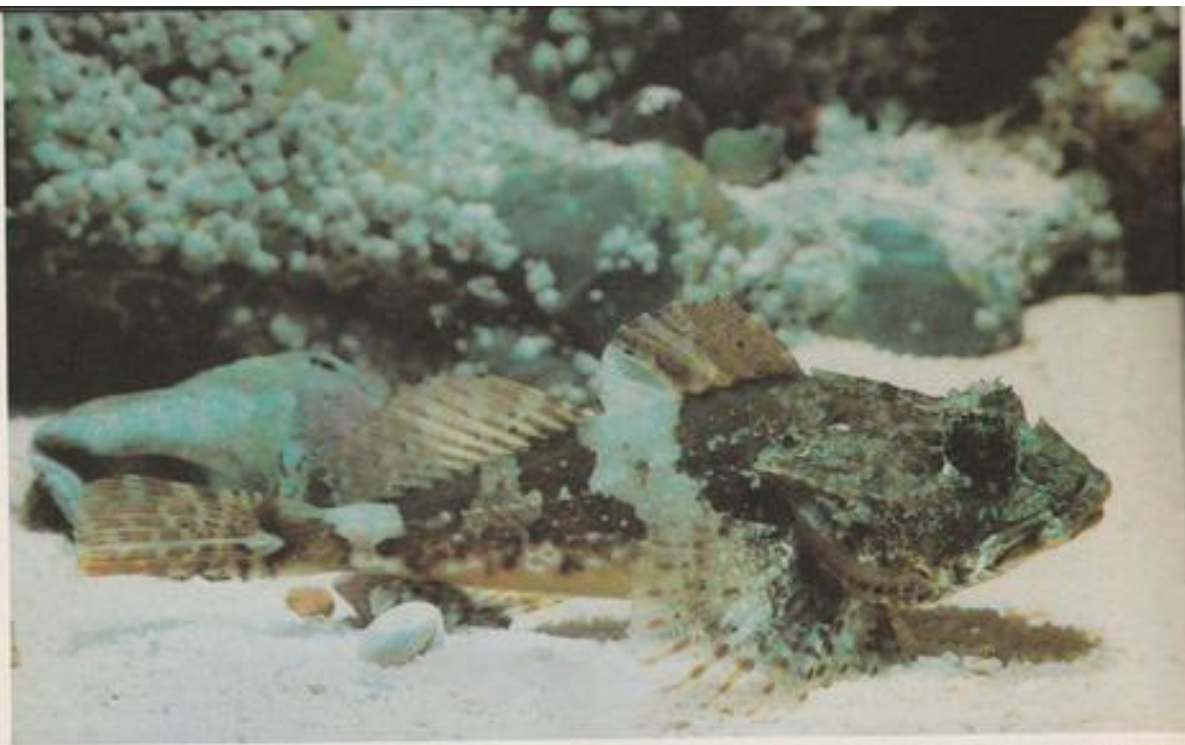
Perhaps, because of a resemblance to the venomous Weever fish, *Echlichthys vipera*, or because it looks like the dangerous Mediterranean Scorpion fish, it is often regarded with horror. The spines are not poisonous, although they could give the careless a nasty graze. Abundant during the Summer months on rocky shores, its presence coincides with the migration of prawns into the littoral zone as the water becomes warmer. My field observations indicate that prawns form the bulk of a varied diet. Small Corkwing Wrasse, *Crenilabrus melops* are also eaten frequently. On mixed fishing grounds where sand or mud intersperse with rocks, they will readily take the opportunity to feed on shrimps, worms and small fish. They do not have sharp teeth at the front of their mouth, so they are unable to tackle the heavily armoured crustaceans, the crabs and their ilk. A point to be remembered when looking for suitable tank companions.

A low Spring tide during the Summer is the best time to catch this fish. Small rock pools are uncovered by the receding waters.

These natural sea aquaria play temporary host to a variety of small marine creatures. Anemones flutter in the still waters and small fish conceal themselves amongst crevices. The fauna is richest as you approach low water mark. A sharp eye is essential. At first the pools seem lifeless, but if you take care with the fall of your shadow, a microcosm of the sea will gradually materialise. In a smallish pool, Sea Scorpions are easy to capture. Gently slide the aquarium net under its spiny head and attempt to ease the fish out of the pool. Invariably, it will hurtle frantically into the net, attempting to escape. If it avoids the net in the commotion, it seldom ventures far, settling on the substrate less than one metre away. The best size to catch is about 5 cm. They grow rapidly in captivity.

Under a tungsten lamp, the cream blotches appear a warm yellow, and the fish does not lack aesthetic appeal. However, it would stretch the most grotesque imagination, to keep this fish entirely for its beauty. The squat form is ideal for withstanding the waves breaking over it, but is unlikely to enhance the living room. Banished to a spare room or cellar, the fish will provide entertainment with its aggressive behaviour and readiness to feed. It will attack anything that moves, especially hydrometers, air bubbles and aquarists. To the sardonic appreciation of visitors, it can be relied on to make a show. Boiled mussel flesh will send the Sea Scorpion hurtling like an angry bull, the full length of the tank, its jaws opening frantically in a desperate quest for food. It has a tremendous appetite and will not be satiated until its silver belly is doubled in size.

Fish living in rock pools need to be extremely hardy to withstand the rigours imposed by their habitat. The Sea Scorpion is supremely adaptive, able to withstand a temperature rise of 10°C within 12 hours, and cope with varying salinity, caused by rainfall or evaporation. For a short duration it is able to survive in oxygen deficient



Sea Scorpion *Taurulus bubalis*

waters. The English Channel varies from 9°C to 15°C, and this is the ideal temperature range. However, in a hot summer it is difficult to keep the water cool. My fish have to endure 20°C for several weeks each year. At these times, I maximise the filtration and aeration, and take extra care when feeding.

The Sea Scorpion will settle down immediately in the aquarium, and start to gobble up the rest of the inmates within seconds of introduction. Exceptionally, a fish will not accept dead food for a couple of days. Otherwise, feeding presents few problems. They will enthusiastically take boiled mussel, raw or cooked white fish, and earthworms. It is a good idea to keep a few live prawns in the tank for the Sea Scorpions to capture at their leisure. For amusement and pandemonium, shrimps are the best live food. A 10cm specimen requires a small mussel, or equivalent, every two days. Three fish of this size can easily be kept in a 60cm tank.

Gravel and rockwork provides a natural decor, with perhaps a sprink-



Sea Scorpion (front view) with seashells. The white skin flaps at each corner of the mouth are not

present in the similar Bull Rout *M. scorpius*



Sea Scorpion (close-up). If you look closely you will notice two large spines on the front gill cover. Most books distinguish only one

ling of crimson and brown Beadlet Anemones, *Actinia equina*, commonly found in sheltered pools between the tide marks. These add a splendid and colourful contrast to the drabber Sea Scorpion.

Despite its relentless predation, the fish can be kept with a variety of other creatures. Anemones, crabs, and most shellfish are compatible. All these are bottom dwellers. In the free swimming area, the companion fish must be substantially larger. Sea Scorpions will make short work of fish smaller than themselves. However, they can live happily together. I have not seen any evidence of cannibalism, or territorial warfare. Their defensive spines may prevent them from eating each other. Although not a shoaling species, over one hundred fish could be grouped together so closely, that

Low water at Shoreham-by-sea. During neap tides this area would be permanently covered by the sea. The ebbing Spring tide leaves rock pools where Sea Scorpions and prawns can be netted

large spine. All the fish I have seen possess two, the lower large spine longer than the upper

every sweep of a prawn net could capture from one to half a dozen fish.

A more robust marine fish can hardly be imagined. If Sea Scorpions fail to thrive, there must be a serious mismanagement of the water conditions. Usually, their growth

is so rapid, from 5 cm to 15 cm in one year, that they threaten other fish, which may have been larger at the outset. Occasionally, they develop a black-spotted parasitic infection, which is hardly noticeable, and does not appear to affect their behaviour.

In the wild, Sea Scorpions spawn in Spring, from February to May, at the end of their second year. Breeding should be possible in a large tank.

Above all, it is the rock pool fish that are the hardest types for the saltwater aquaria, and the principal recommendation for the Sea Scorpion is to an inexperienced enthusiast who wishes to try his hand at keeping marine fish.

Reference:

¹ Key to the Fishes of Northern Europe. Alwynne Wheeler 1978. (Warne)

Glossary:

Caragheen; *Chondrus crispus*. A type of red seaweed, also known as Irish Moss. It can sometimes be kept in marine aquaria.

Littoral zone: Intertidal region of the seashore.

Shellfish (Molluscs): Marine snail type and bivalve shelled invertebrates. It does not include prawns and shrimps. (Squids etc. are molluscs, but these cannot be kept with Sea Scorpion).





Coldwater Jottings by Frank W. Orme

The July issue of the magazine published by the British Koi-Keepers Society contained a leaflet headed 'STOLEN' which may serve as a warning to others. After the B.K.K.S. National Show, held on the 20th of June at Taston Park, Knutsford, Cheshire, thieves stole twelve koi of varying sizes from 7 inches up to 16 inches. They also took five water pumps with fittings, three 'Salter' spring balances, 5 battery operated portable air-pumps with lines and air-stones, 2 grey plastic 14 in. x 10 in. tanks, a Pentax camera and the Northants Section show tent together with a car belonging to Mr. Richard W. B. Guilford. The car, and four of the fish, were later recovered from Brownhills, Staffordshire at 2:30 a.m. on the morning of Tuesday the 22nd of June. Whether the various items were already loaded into the car, or were stolen and then placed into the car by the thieves, I don't know, but the fact remains that eight of the koi and the other equipment were not recovered.

What use the tent will be to whoever stole it I cannot imagine, for it is quite distinctive according to its de-

scription—a yellow and orange Good Companion Major with an extended fly-sheet—it is decorated with a painted Nishikigoi logo in red and a large Japanese style Showa. Mr. Guilford gave his telephone number as 0536 72 5681 and asked that anyone who had the slightest suspicion as to the whereabouts of any of the stolen property, or had any other information which might be of assistance, contact him any evening or weekend. If any reader has been, or is, offered any low-priced koi or cheap 'Nugget' or 'Grundfos' Selectric water pump or other item mentioned earlier—and the source of supply is not well known—it should be viewed with some suspicion and Mr. Guilford may welcome hearing from you. Unfortunately, by the time these words appear in print the ill-gotten gains will more than likely have been sold to some unsuspecting buyer, or found a place in the pond of the thief's own garden.

Lush growth

During the spring and summer both terrestrial and water-growing plants have made lush growth, following the severe winter, and this has resulted, in

some instances, of an overgrowth of plantlife. My own pond has produced quite a display of waterlily blooms; water iris flowered in profusion only to be equalled by the abundance of blossoms from the other plants. The spread of some has been remarkable, and will have to be reduced if they are to be prevented from crowding out their less prolific neighbours. Too much vegetation can spoil the appearance of the pond if left unchecked, it can also become a hazard during the winter months by causing pollution as the greenery dies back and rots in the water. During the latter part of this month, or during early November, I shall choose a warm, dry weekend to undertake the chore of giving the pond a pre-winter clean-up, and the opportunity will be taken to thin out those plants which have spread beyond their appointed boundaries. I am a firm believer in cleaning out the pond before the onset of the very cold winter months, as this provides a reasonable assurance that fish will survive safely until the return of the warmer weather. Under normal circumstances all that is required is that the bottom mulm and debris, together with any rotting vegetation, be removed after emptying the water from the pond. The mulm can be placed upon the garden where it will benefit the plants. The pond is then refilled with clean water thus providing the fish with good conditions in which to pass through the worst months of the year. Of course, this also gives an ideal opportunity to inspect the fish to ensure that they are in good health, if they are not then suitable treatment can be given before returning them to the pond. Fortunately, in a well maintained pond, such problems are rare.

In the July issue of the 'Aquarist & Pondkeeper' Roy Pinks suggested, in his Commentary column, that a National Society catering for all fish-keeping interests would be a worthwhile proposition, and that such a broadly based society could produce an annual Yearbook. I also feel that a National

Coldwater Jottings

Society, of some form, is a worthy idea; however, I feel that there would be only minimal support, if any, forthcoming from the specialist groups who tend to be somewhat insular in their outlook. Nevertheless, if the society were to steer clear of standards and the competitive aspects of the hobby, and devote itself to furthering the interests of all branches of fishkeeping in an impartial manner—not favouring any particular branch or interest more than another—then, I feel, it could be a success, especially if it set out to attract as wide a spectrum of the

fishkeeping fraternity as possible. Behind the scenes it would be necessary to work with other organisations, and not in opposition to them. Past years have proved how easily antagonised some groups are, and the consequent ill-feelings take a long time to overcome.

Possibly the Yearbook is the most interesting idea, and one that could prove most useful to the hobbyist. As Roy Pinks wrote: "Into such a vehicle one can pack the sort of information which you can never find by looking through the press or some of the more useful books on the subject." For instance, it can contain a directory of societies and their particular interests; national and area organisations; manufacturers, importers and retailers; water garden centres; fish hatcheries and so on. It could also contain details of amateur fish breeders.

To give added interest there could be tables of quantities, calculations and conversions plus short informative articles and, as suggested by Mr. Pinks, research papers from the various specialist groups; it might also contain brief background information about the various personalities of the world of fishkeeping and details of public aquariums and other places of interest. Such a Yearbook could be produced and published by one or other of the larger organisations which cater for our hobby and, whilst I feel such a venture would be well received, it might be interesting to learn readers' views on this and Mr. Pinks other suggestion for a "broadly based national society." I hope, R. P., that your ideas will bear fruit—who knows, if there is sufficient support, this journal might seriously consider your proposals!

READERS WRITE

Continued from page 30

p. and p. is a booklet entitled "An introduction to breeding and rearing tropical marine fish" which gives similar details to Dr. Goldstein's article but in greater detail and also shows how to set up incubations, larval rearing and juvenile on-growing tanks.

I met Paul and Andrew at last year's Manchester B.A.F. where they had a stand to promote their products, and then in June this year when I visited Oban for a week's diving holiday.

The enthusiasm that they show for their work is reflected in the willingness to help anyone interested in breeding tropical marine fish and I would suggest that anyone who would like to try their hand at this exciting new

part of our hobby should contact Paul West without delay.
Gtr. Manchester.

Frank Townsend.

Koi Pond Pump

Sir,—I was interested to read Mrs. Allen's reply to the question regarding using a water circulation pump for pumping water in a Koi pond.

I have experienced similar problems but found that the answer was somewhat different from that suggested by Mrs. Allen.

The problem is that this type of pump tends not to expel air from the pump chamber when mounted horizontally. If it were possible for your reader to turn the pump through 90 degrees so that the flow is moving from the bottom to the top of the pump, this will automatically expel the air, enabling the larger diameter pumps to be kept.

J. N. CARRINGTON,
Managing Director, (Interpet Ltd.)

DISCOVER THE FISH

By Pisces—

The first is in METAL but not in FATIGUE

The second is in CLUB and also in LEAGUE

The third is in DISCOUNT but not in PRICE

The fourth is in SHREWS but not in MICE

The fifth is in BUCKET but not in SPADE

The sixth is in RETAIL but not in TRADE

The seventh is in PEN but not in INK

The eighth is in PLUG but not in SINK

The ninth is in EMERALD and also in GREEN

The last is in FEATHERS and also in PREEN

MUSKIPPER

Botia
macracarilla

Bleeker 1852

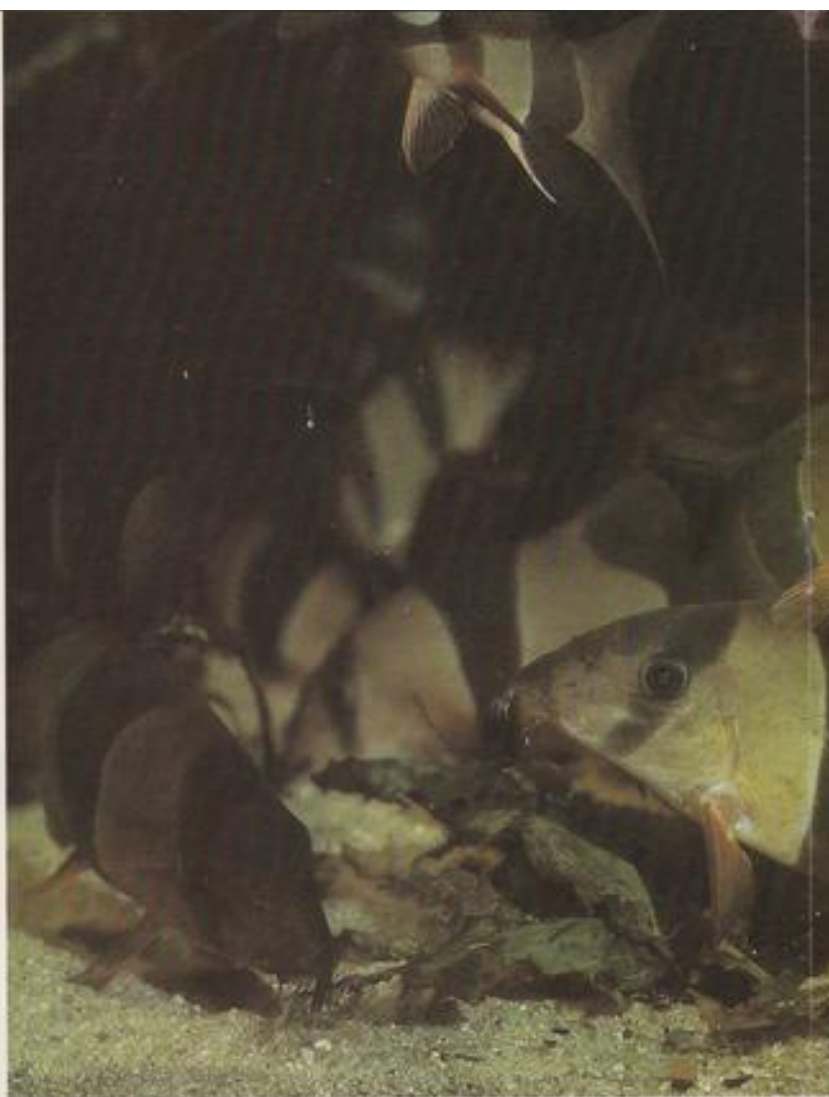
written and illustrated
by David Sands

OF ALL the members of the genus *Botia* the clown loach must represent everything aquarists require from a substrate feeder.

They are classical tropical freshwater fish because of an outstanding colour pattern, black vertical bars, pre and post dorsal and eye band on an orange brown body. A fully grown specimen, never more than 15cm (6in.) in aquaria or wild caught about 20cm (8in.) has a bright, comical appearance and is a delight to own. Without fellow companions they remain light shy, often failing to make an appearance for several days. A group together, (which can be expensive—they have always been so), perhaps up to half a dozen are much more active and shoal about quite happily.

They and other members of the genus originate from Indonesia, distributed across Thailand, Malaysia, Java, Sumatra, Borneo and are exported from Singapore to Europe.

They inhabit slow moving creeks and in sharp contrast, inland rivers, many species living a semi territorial existence in-between submerged



THE CLOWN LOACH



A group of Clown Loaches in an aquarium from Artis Zoo and Aquarium Amsterdam. These large specimens attracted a great deal of interest from the public

tree roots, forest debris and aquatic plant life.

To keep *Botia* successfully it is essential to attempt to recreate such conditions, soft, acidic water is a must; most community aquariums contain a piece of bogwood; the tannic acid released into the water from the 'Malayan' bogwood gives the water the correct organic colour. Various *Cryptocoryne*, *Aponogeton* and 'Java fern' style plants can aqua-scape the scene perfectly. Such an aquarium could

house several clown loaches and be ideal for a shoal of 'pearl' or leeri Gourami. (*Trichogaster leeri*) the inclusion of which would create an aquarium layout worth watching.

Clown loaches are infamous for developing white spot; an attack by this parasitic infection seems mandatory when they are purchased. *Botia* are scaleless, therefore prone to parasitic attack and react badly to a change in water conditions, say from acid to neutral. All fish

carry a strain of white spot so the problem is lurking, on the prowl for a fish under stress. Most importers/retailers are without the facilities to prevent the water change problem—your aquarium is the last stop in a troublesome journey for any fish. If clown loach are introduced to an aquarium system not yet mature in filtration terms (under six weeks old) then they will certainly break out in white spot—it is much better to wait until the aquarium has matured and as a precaution it would not harm established fishes to be dosed with a white spot cure when clown loach are introduced.


There have not been any breeding accounts of *Botia macracantha* published. The difficulty in growing young imported fish to size probably explains this.

The Singapore fish farmers are rumoured to be breeding them with the use of hormone treatments, if this is true it seems strange that imports are seasonal and not available all year round.

They feed happily on *tubifex* worms, better still on chopped earth worms or blood worms. Any food given to them is best offered when the aquarium lights are off to be sure they are the fish to benefit. Clown loach and all *Botia* have eye spines, a defence mechanism brought into play when territorial squabbles become heated. Many a *Labeo bicolor* has been wounded in an ownership dispute with a clown loach over a cave.

All *Botia* can be aggressive, so it is advisable to closely observe a newly introduced specimen which may squabble for the use of another occupant's favourite spot. A good feed of frozen or live blood worms and a general change about of the aquascape in the aquarium should reduce these problems.

This behaviour is the only flaw in the make up of an excellent community fish. Its colour, long life span and interesting character means this established 'chart topper' will remain in the favourite aquarium fish list forever.



COMMENTARY

by
Roy Pinks

OF ALL AQUATIC subjects perhaps the most misunderstood and under-estimated are the small floating plants, commonly referred to, and often wrongly, as "duckweed": anything much smaller than a water lily pad will qualify for the misnomer. The contempt with which this group of plants is treated stems from the association of duckweed with "slimy and smelly" ponds which they usually cover from bank to bank. If folk who think such nonsense (and it is they who describe snakes as slimy too)—would take the trouble to poke their index fingers into duckweed covered pools, they would find that these wonderful little plants are as crisp as garden peas, just as nice a colour, and that the water in which they live is clear as crystal. Here is living testimony to the value of light reduction in eliminating algae—if you cut down the incidence of strong sunlight on pond water you will reduce, correspondingly, the tendency for free-swimming algae (which are what make ponds go green in the spring) to reproduce in large enough

numbers to make the water unsightly.

Green water is no great disadvantage so far as fish are concerned, and most will live in it quite happily. In fact, there are countless cases where sick fish have been put in green water, more in desperation than otherwise, and they have recovered. Certainly, young goldfish love it. The main offence of green water is to our eyes, as we somehow think it is unclean and poisonous in some way, and even normally intelligent people resort to chemicals in some form to remove the offending sight. A friend of mine usually comes round in early

summer to collect surplus plants from my pool to put in some decorative ponds he has in the grounds of his aviaries, which are open to the public. I saw these the other day, and they are like thick soup, so I shall try to persuade him to let loose some floating plants and see for himself whether or not they are more effective than the chemical blocks which he has already bought at some great cost, and which I hope he will jettison.

I would agree that where decoration is a consideration, the native duckweeds are a little ordinary and suggestive of neglect, but I shall give him some of my Fairy Moss (*Azolla caroliniana*), which could never be classed as mundane and always looks attractive, delicate and nicely coloured. In its early stages it is light green, which then darkens with maturity. It eventually assumes pinkish and red overtones, and I am not sure whether this derives from longer day length and brighter light, as is often supposed, or from colder weather. Certainly, in the autumn there is very much a ruddy tinge about it which seems to disappear if it is brought indoors to over-winter. However, this lacy looking delight does much to enhance the appearance of any pond during the summer months, and it is highly successful in both coldwater and tropical aquaria all round the year. Its rate of reproduction is quite phenomenal, and in its eagerness it seems to pile up against itself, forming crust upon crust—somewhat alarming

Continued on page 58



Azolla one of the most attractive and prolific of the floating miniatures

TWO AFRICAN KILLIFISH

Written and illustrated by Rudolph Zukal

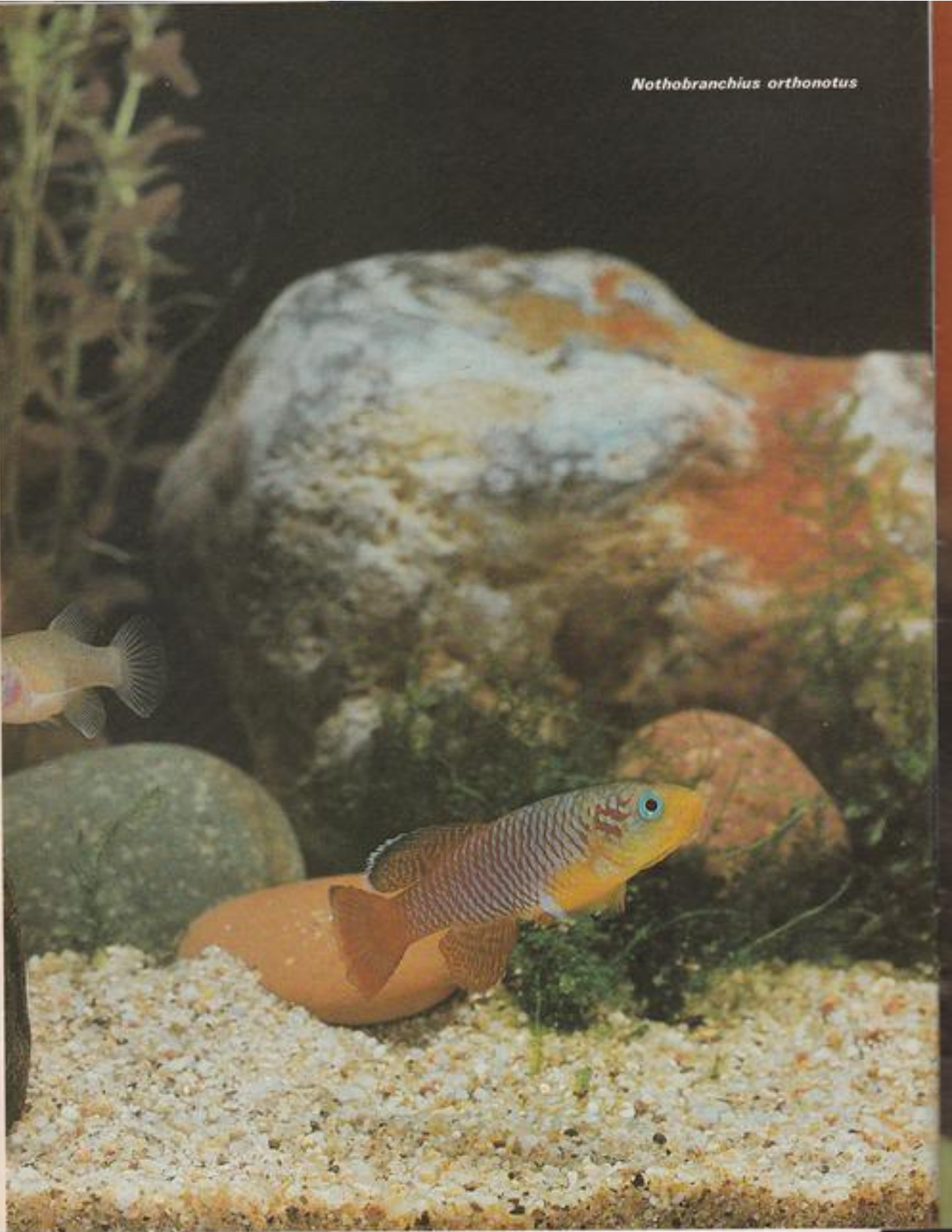
Nothobranchius orthotomus

When one reads that this splendid egg-laying toothcarp was first imported in 1913, one might think it is a well-known member of the aquarium. This is not the case as a long time had to elapse before hobbyists managed to breed these fish successfully. As late as 1959 Mr. Koch wrote in the ATZ vol. 69 that from 20 eggs only 5 young had hatched. Those were the experiences of then. Many aquarists knew this toothcarp by its former name *Nothobranchius guentheri*. The fish in question is a member of the family Cyprinodontidae and its place of origin is given as East Africa from the delta of the Zambesi river up to Somaliland in the north, together with the Seychelles and Zanzibar. It attains a size of 6cm and its body resembles fish of the genus *Aphyosemion*, except it is a little more compact but more slender at the base of the tail. I will not attempt to give a description of its coloration—this is far from easy in the case of this species and a colour photograph says more. The two sexes can be easily distinguished. Whereas the male has resplendent colours, the female has a plain grey-brown colouring with fins which have no coloration or markings.

To keep this species a medium-sized tank is sufficient, at a temperature of 20°C. The fish are not particularly demanding with regard to conditions, type of water and cleanliness. The only absolute necessities are a plentiful supply of plants in the tank and a soft aquarium floor. They are peaceful, with only the males fighting amongst themselves. The temperature should not be raised unnecessarily, otherwise the already short life-span of the fish (one year) will be further reduced. As they grow quickly, the fish need an adequate supply of nutritious live food.

For breeding purposes the temperature is raised to 22-24°C. A 5cm deep covering of peat is placed on the floor of the tank, which can be a fairly small one. Several pairs can be bred at the same time. Pressed together, a pair deposits the eggs on the soft tank bottom. The spawning action takes place at intervals of several days and is similar to that of *Aphyosemion* species. After spawning the adult fish are removed to a second tank which can in turn be used as a breeding tank and the water is carefully siphoned off. The peat and eggs are kept in a moist condition for 4-6 weeks. After this period of time the peat and eggs are covered with rather soft water and, after a few hours, the fry hatch out. Rearing the young fish is not difficult, they grow quickly and they are already sexually mature at three months. Many aquarists make the big mistake of covering the peat with warm water. According to my experience this is incorrect. I use rain-water which has been left standing and warmed to room temperature only, or a little colder. Next I place the tank and the peat in an elevated position away from any draughts in the room so that the temperature gradually rises. In this way success is safe-guarded. On the subject of nomenclature, earlier names for this fish were *Fundulus orthotomus* and, later, *Aphyosemion guentheri*. In order to show the spawning behaviour of these fish clearly, I have used Java Moss rather than peat as a spawning base. When spawning and the taking of photographs had been completed, I was rather concerned about the eggs and removed them with the aid of a glass rod onto damp peat. In this way successful rearing ensued.

Nothobranchius orthonotus



Nothobranchius palmquisti

THIS SPLENDID toothcarp inhabits the waters of southern Kenya and former Tanganyika. From here it was first brought to Europe in 1957. It reaches a maximum size of 5cm with the female being slightly smaller and, compared to the male, having a rather subdued coloration. The fish is very similar to the well-known *Nothobranchius orthotomus*, although the black border to the caudal fin is missing in *N. palmquisti*. Sterba mentions in his book 'Freshwater Fish of the World' that it is thought that the two species are identical and that *N. orthotomus* is merely a variety or colour variation of *N. palmquisti*. But let us leave it to the scientists whether it is a case of variations or separate species and devote ourselves a little more closely to the fish in question.

As already stated, the fish resembles *N. orthotomus* but is a little smaller and has bluish eyes. The abdomen is yellowish. The scales are more distinctly edged with red, so that as a whole they form a network of markings. The rear part of the body is predominantly green. The chest and ventral fins are edged with light blue. The dorsal and anal fins are striate and bear brownish-red markings. The caudal fin is red without a black border. The female on the other hand is coloured an unobtrusive grey-brown colour, with the lower part of the body silver shading into green.

The fish will feel at home in a medium-sized tank at a temperature of 22°C. They are not particularly fastidious with regard to the nature of the water and hygiene. However, they need a tank which contains a fair number of plants and a tank floor of soft material. The males conduct fights amongst themselves and a dead male and sometimes a female is found in the aquarium. A relatively high water temperature curtails the already short life of the fish. Young fish grow very quickly, and within three months they are sexually mature and can be used for breeding. Mature fish, unfortunately, suffer quite often from tuberculosis, mainly from bacteria of the genus *Oodinium* if they are kept in dirty, soft and slightly acid water.

For breeding purposes a smallish, whole glass tank, with normal tap-water, is suitable. Several pairs can be bred at the same time. A peat bottom of about 5cm is placed in the breeding tank. These fish are typical bottom-spawners and the eggs are produced one by one by the female and pressed into the floor covering of the tank by the male with his tail. Spawning takes place at intervals of several days. After spawning the breeding pair is removed or the eggs are carefully withdrawn by means of a glass tube. The eggs must be kept in damp peat only for a period of 4-6 weeks. After being covered by soft water the young fish hatch after a few hours. Rearing the young poses no particular problems and they grow very quickly.



Nothobranchius palmquisti

WHAT IS YOUR OPINION?



by B. Whiteside.
B.A., A.C.P.

"IN THE JULY issue of *The Aquarist* you asked for readers' opinions of the recent BBC tv series 'Fancy Fish.' It is pleasing to see that our fascinating hobby has been recognised by television; but in contrast to Mr. Keith Barraclough, who seemed well-pleased with the series, I do have some criticisms to offer," writes Mr. Andrew Young, who resides at 43 Lawn Drive, Swinton, Lancashire. He continues by saying: "I feel it was a mistake that the first programme was dedicated to a great extent to the showing of fish in shows. To the newcomer to the hobby, or an observer with only a passing interest in fishkeeping, it may have seemed very cruel to keep fish in small jars; and, indeed, many actual hobbyists believe this to be so. Also, the first programme showed various types of 'fancy' goldfish—which were seen to be struggling with their globe eyes, and their excessive and unattractive finnage. It really was the wrong way to begin a series.

"It would have been much better to have shown the second programme in the series first because it showed how relatively simple it is to keep fish in the home. Perhaps it would have been a good idea if the first programme had

featured some attractive display tanks, which many retailers have, as this would have shown the many attractive landscapes it is possible to create, and this would surely have attracted more people to the hobby than rows of sweet jars with forlorn-looking fish in them. Still, although the programmes did have faults, it is to be hoped that they are a sign of greater things to come as far as television and fishkeeping are concerned."

Mr. John Blower lives at 18 Pembroke House, Leamore, Walsall, and writes: "I read your column in the July issue in which you asked for information on the keeping and breeding of angelfish. I have kept these fish for about 18 months and I have had relative success in breeding adults, and in raising the fry. Having bought a large pair of marbled angels I placed them in a 30 in. tank with only a flowerpot, placed upside down, for decoration. After a short while the female, which was slightly smaller than the male, began to clean a small area on the side. Later she started to lay a number of eggs—and was closely followed by the male, which fertilized the eggs.

"After the egg laying had stopped I removed the male because I had found him to be an egg eater during previous spawnings. This left the female to look after the eggs—which involves constant fanning with her fins to stop any fungus forming on the eggs. This is done for a four-day incubation period. When the eggs hatch the female takes the fry into her mouth and places them onto the floor of the tank. When all the fry have hatched the female eats the empty egg 'cases'.

"I did not feed the fry for three days because they get nourishment from their egg sacs. After this time I fed the fry newly-hatched brine shrimps in small quantities. As the fry became free-swimming I removed the female; and I started to feed the fry

three times per day. This I did for two months; and they are now beginning to eat crushed flake foods.

"I have had to cull many of the fry because they were slow-growing and deformed. This has to be done if good results are wanted. I was surprised to find that from a marbled pair of angels I have got: marbled, striped and even golden youngsters. This goes to show that you can get different varieties of angels from any type of parents. I have also now successfully mated a female with two different males.

"I've joined a local fish society which I must say has helped me to make many new friends and gain a lot of information on many subjects apart from fishkeeping. I would highly recommend anybody who keeps fish to seek out his local club by asking at the nearest fish shop."

Photograph 1 shows a female angelfish spawning.

In last month's feature I included a letter about breeding snakeheads from Mr. F. D. Y. Mockey, of 15 Ainsdale Avenue, Blackpool. In a second letter he continues his account. It begins: "Spawned 20th June 1982. The young are now two days old and some are breaking away from the main batch and searching around for food. I gave a little dust food, and a liberal supply of micro worms. Time: 9.00 a.m.; depth of water—8 in. 12.00 p.m.—all babies are swimming around, fed once more with micro worms because they go for the micro quicker than the dust food. I read in a book that they have a habit of swimming upside down. On close inspection I noticed that they have a bump at the rear of the head; this corresponds with their little, full bellies, making it a hard job to see which way up they are swimming; but they are the right way up.

"The colour of the fry is brown at this stage, with no other actual markings. The parents are still collecting the young I left with them. The water temperature in



Female Angelfish spawning

both tanks is 78°F; the depth of water in the parents' tank is 13 in.

"When the fry hatched I thought that there were around 300; but now I do not think I would like to hazard a guess as to how many, as the whole tank is alive with them; so I am now setting up another tank of 36 in. × 15 in. × 12 in. I have now settled down to feeding them 12 times daily and have set up six 2 lb. jars of brine shrimps' eggs, ready for early use. These will be used as a battery system, two per day, and I will keep them going. I am now using non-lodged salts.

"It's the third day and all the babies are swimming strongly now and still taking micro worms. At this stage I have put in a few sifted *Daphnia*. On day four I have cut out micro worms because all the babies are able to take *Daphnia* and small flake food. The babies are now double their former size. On day six I took out half of the babies and put them into a 48 in. × 15 in. × 15 in. tank; all babies fed on sifted *Daphnia* have noticed no losses up to now, but two young ones have had their tails bitten by others, so I have disposed of both of them.

The other babies are marked more like the adults for colour and stripes. It is quite obvious that they need little more care than keeping the tank clean and good feeding from now on, so I will close by saying that I do hope other aquarists will take to this sedate fish.

"It's June 28th and some fish have spawned in my outdoor pool—so here I go again! Good luck to all."

Mr. T. Share's address is 487 Sutton Road, Walsall, West Midlands. He writes: "With the exception of tanks containing large cichlids such as the Texas, and big gouramies such as *Ophronemus*, I don't think aeration or filtration is necessary. When I set up a tank to breed some fish I always make sure the balance is about right. Really, you should never use an air pump with small fish. The trouble comes when you've a big fish that makes a lot of mess and rips up all the plants. Personally, I use filtration only for the following: 24 hours a day for my big goldfish tank, big gourami tank, big South American cichlid tank and my Malawi tank.

"For these tanks my favourite

filter is a box filter. Into it I put 1 in. of gravel, 1½ in. of carbon, and then fill up with filter wool. I believe cartridge filters are very good—especially in tanks over 42 in. in length. I have U/G filters in most of my tanks but rarely use them now. The pumps I use in my tanks are mainly Arrow pumps and these get repaired cheaply and quickly. Obviously they can be used only for very small tanks."

No. 36 Holmfield, Burbage, Buxton, Derbyshire, heads a letter I received from Mr. David Fanshaw. He wrote: "I first started keeping fish just over four years ago when I was 28. A friend of mine talked me into keeping tropicals but first of all I went to see his 24 in. × 12 in. × 15 in. tank. Then I decided to start keeping tropicals. I began with my old 18 in. × 9 in. × 9 in. framed tank, which took rather a long time to seal. It wasn't long until I saved up enough for an all-glass 36 in. × 12 in. × 15 in. tank—and I now have two.

"The first fish I bought have now nearly all died, but they have been replaced by other fish. The flake food I use is Aquarian. It was recommended when I bought my first few fish. Every bit is eaten. Feeding the fish I have is not an easy task because I have a varied selection of fish ranging from glow-lights to angels in my tank. I have some fully-grown and some partly-grown fish. I seem to find that they grow fairly quickly on Aquarian. I have bred some fish but as soon as they become free-swimming the fry get eaten either by the parent fish or other adult fish—but that is another story. The price of some fish has risen slightly; but they are still cheap compared to other areas.

"There is only one shop in town where I can buy tropical and coldwater fish, but no marines. The owner has put in bigger tanks and, obviously, more fish; hence viewing is easier.

"If any readers would like to

Continued on page 50

THE SADDLED
BUTTERFLY
FISH

Chaetodon falcula
by David Morgan



Continued on page 46

Continued from page 44

CERTAIN Butterfly fishes have remained favourites with marine aquarists for many years. One reason for this is undoubtedly their sheer beauty, but another must surely be their peaceful temperament. This tolerant disposition is an inheritance of their natural life style; being fishes of the open waters they have no need of territorial instinct, as do their cousins the Angel fishes, that tend to lead a more solitary, sedentary life. As such they have no need of the aggressive persistence exhibited by these close relatives, though it is not always possible to include two of the same species within the close confines of a single aquarium. The hardier varieties of Butterfly fish are splendid additions to a properly maintained system.

A species that qualifies admirably in all departments is *Chaetodon falcula*, the Saddled Butterflyfish.

Typically of the Butterflies, it has an elongated snout for probing crevices in rock or coral outcrops of the reef. It is not a great polyp feeder ordinarily, but takes primarily small crustacea.

Its body is basically pale blue with a series of deeper stripes which run vertically along its flanks. It is bright yellow along its back, posteriorly and caudally, with a black bar through the caudal peduncle, and another through the eye. Two black saddles adorn its back. A fully grown specimen may reach 200 mm (8 inches) in length.

The fish occurs naturally throughout the Indian Ocean and the Red Sea, but is never encountered in very large numbers. This could well be the reason for its rarity on the market. Imports occur to Europe only occasionally, and for some reason seldom, if ever, to the United States. This affords the European aquarist an opportunity to become 'one up' over our American colleagues.

The specimen I have is some 85 mm long now, and has proved a very robust fish that has adapted very well to life in captivity. It is not in the least aggressive towards its tank mates

and swims regular patrols around the whole of its aquarium. It is an active personality fish that has become very tame and will display itself at the front of the aquarium when it feels it ought to be fed.

Most reports confirm that the species usually inhabits shallow waters but occasionally an individual will be found at depths greater than 25 metres. I suppose it depends upon what parameters are used to define the word 'shallow'. Certainly it is happy in 450 mm (eighteen inches) anyway.

A settled specimen will feed heartily upon a variety of foods. The larger freeze dried foods such as pacific shrimp, fairy shrimp, etc., will be taken from the surface, while the occasional shredded cockle will be eaten from the bottom. The aquarist offering food in this manner should keep an eye open for discarded flesh. In the fish's excitement it may tear pieces of shellfish too large for it to swallow and simply push them aside in its impatience to continue its feast. Despite its appetite, it is a delicate feeder and will come off poorly at meal times if boisterous, greedy fishes share its tank. Though capable of defending itself in true Chaetodon fashion, by raising the spines at the front of the dorsal fin and facing the attacker, such disturbances at meal times serve only to unbalance it.

On a diet so high in protein as this, it is not surprising that the fish's growth rate is rapid, and one must take care not to overfeed.

I have noted an interest in the algal growth on dead coral heads with my own specimen. It will bite off pieces of green algae but does not swallow them. I am now attempting to persuade it to try some vegetable flake by mixing it with a few freeze dried *tubifex* worms. After a couple of weeks I am now meeting with some success. So far it has refused fresh lettuce, as with the algae, apparently because of taste. I will continue to offer alternatives in the hope of finding a preference. Exactly how important vegetable matter is in its diet is not

clear, but it would be foolish to conclude that none is taken in the wild, since analysis of the stomach contents of other Chaetodons has revealed a very comprehensive range of foods.

Although desirable from a cosmetic point of view, extravagant rockwork is not necessary with this species; a few coral heads will suffice for its needs.

Apparently no more susceptible to disease than any other member of its family, it is perfectly tolerant to copper treatments, and these may be used as directed without fear of any harmful effect.

There is another species of Butterflyfish, *C. whitensis* that is also called the Saddled Butterfly. It somewhat resembles *C. falcula* but is not nearly as impressive and so is ignored by collectors. The most obvious difference between the two species is the extent of the black bars. In *C. whitensis*, they reach much further down the flanks of the fish. This species is found in the mid-Pacific.

Water conditions, as with any Butterflyfish, must be maintained at the very highest quality. A brisk circulation and regular small water changes, together within a moderately populated tank, are essential if the fish is to remain healthy.

The preferred temperature is 78°F (25°C), but lower temperatures, down to 70°F (21°C), will be tolerated for short times without any ill effects.

Specific gravity should be maintained between 1.025 and 1.030. At this salinity certain of the flagellat parasitic infections (unfortunately the most devastating the marine aquarist is likely to meet) flourish, so close inspections must be made and action taken promptly if needed.

Incandescent lighting is adequate to show the fish. Fluorescent tubes do nothing in this case to enhance the coloration.

I consider this species to be one of the best representatives of its genus in the home aquarium, my only regret being that I had not come across it earlier.

CRUCIFIX FISH



by
Chris Mattison

The accompanying photograph shows the skull of a marine catfish known, for obvious reasons, as the 'Crucifix Fish'. The resemblance it bears to a sculpture depicting the crucifixion is uncanny, even down to the halo around the figure's head. The skull was acquired when a university's zoological collection was disposed of and little is known of the identity or natural history of the fish concerned, except that, judging from the skull's size—approximately eight inches by three and a half inches—it is quite a large species.

Continued from page 43

correspond with me I should be most grateful; and until next time I write keep your column as good as ever. I enjoy reading some people's views on fishkeeping."

Mr. Angus Lafferty's home is at 52 Tukes Avenue, Bridgema, Gosport, Hants., and writes: "In the May 1982 issue you invited opinions on the topic of the kribensis, *Pelvicachromis pulcher*. Well, here are some of mine. Kribensis first took my fancy in October 1978 soon after my interest began in this hobby. I made the mistake of purchasing two males that proved incompatible—to say the least. One was hurriedly exchanged for a deep yellow and red coloured female. As soon as she was introduced to my 24 in. x 12 in. x 15 in. community tank the male began to construct a 'nest', transferring gravel in his mouth until a depression was formed under a convenient overhang.

"It was not until mid December that my diary recorded the surprise sighting of six kribensis fry of approximately 4 mm. long from head to tail. The parents proved very possessive, nudging and threatening the other fish in the tank. The presence of myself and family members gazing into the tank seemed to have a detrimental effect on the brood as soon only one, a male, remained.

"The 10th January 1979 saw a fresh spawning with eggs laid upon the roof of their rocky home causing the male to have to swim upside down to fertilize them. 13th January: all the eggs have hatched and a seething mass of fry can be observed; fed with fry food. 15th January: no trace of fry can be seen, prompting investigations—the only conclusion being that the male has eaten them upon being disturbed by our observations. The original, surviving kribensis is now 1 cm. long.

"Despite three more broods over the next four months no more survived. 11th May: male kribensis

died of old age—and exhaustion? It was interesting to note that the female kribensis became very distraught by this occurrence, for a while, but calmed down in time. 21st November 1979: purchased another male; the three kribensis getting on well together. 7th December: observed the now familiar mass of fry; kept the tank unlit; fed with Liquifry; otherwise kept away. 16th December: counted approximately 40 fry being herded around the tank; surviving member of original spawning under attack from dominant male. 23rd January 1980: fry now 1cm. long on average; problems increasing with the two male kribensis; also members of this community tank looking ragged and troubled. Separated parents and placed in new tank; female subsequently died; male returned to local shop. The brood subsequently reached maturity over the next year with 15 females and 25 males being produced. I was able to sell these locally for £15.00.

"For the record: tank size—24 in. x 12 in. x 15 in.; pH neutral; hardness—very hard (chalk water

area); gravel base with U/G filtration. In conclusion: it seems that kribensis are easily kept and spawned, being very tolerant of water conditions. When adult, males are incompatible; exist best as pairs; intolerant; prone to severe bullying if placed in a community tank. They seem to have a need to dominate and create territories. Above all, I feel it should be emphasised that potential buyers should think carefully before introducing them to a community tank: it's very disheartening to be menaced through the glass and watch passive fish being seen off." (Photograph 2 shows a female kribensis, *P. pulcher*.)

I was pleased to hear from several of our lady readers recently. Mrs. J. Wardlaw's home is at 15 Portal Road, Grangemouth, Stirlingshire. She says: "Thank you for printing my request for a jar for my Diatom filter in the April issue. I am happy to tell you that a gentleman from Swansea answered and at the moment we are arranging the sale. I am very grateful for your help.

"In the February issue you were asking about people growing

Female Kribensis—*Pelvicachromis pulcher*



Cabomba. Here are some hints which may help someone. *Cabomba* grows best if there are no floating plants to hinder it from receiving maximum light. It does not like moving water so is best planted away from filters and air stones. When we planted our furnished aquarium for the Scottish Aquarist Festival we put no fish in it until it went on show. Instead some mulm was included from a well-established tank and the plants were 'fed' with soda water which, we understand, is 'gassed' with carbon dioxide. This should not be used in a populated tank as the fish will soon become unconscious. Although we did not appear in the prize list the plants grew very well during the four weeks the tank had before the show. The bulk of the plants were *Cabomba*; and it also does well in my own tanks.

"The enclosed item about angels first appeared in Grangemouth A.S. news letter *Fins and Things*; and later in the Tenth Programme of the Scottish Aquarist Festival, April 1982. If there is anything of interest I will be pleased for you to use it."

Mrs. Wardlaw's article is entitled *Have patience with your angels*. She wrote: "How often do we read—'Take a pair of fish...?' I maintain it is impossible to be sure of the sex of angels until the ovipositor is evident just prior to spawning. Often the fish themselves don't seem to know since two females will spawn together and two males will agree quite well until one has the urge to spawn and then there is mayhem. A true pair will quarrel viciously, locking jaws and tearing at each other, so that the bewildered aquarist, fearing injury to his fish, will separate them. Therefore the old method of obtaining six young fish and allowing them to select their own partners is still the best and not nearly such a violent procedure. Angels do not become mature until 10 or 12 months old, depending on how well they have grown. In my tank I always have

more females than males and from watching their behaviour find that the males stand around in lordly fashion while the females slog it out. Knowing my own fish makes me able to sort them into pairs with a fair degree of accuracy. Once a pair have been selected they are introduced into a tank with broad-leaved plants as well as grasses, and a piece of roofing slate may be added so that they may have a choice of spawning sites. The base of the tank is gravel-free; it is dark with algae and the plants are weighted with lead. The temperature is 80°F. It is useful to have a screen of plants and a very few, small, harmless but bold fish like platies. The reason is that when the angels spawn they chase the other inhabitants into the plants, where the platies provide enough threat to keep boredom at bay while the eggs are hatching. It is no fun guarding young when there is no danger; and often the pair fight because of this.

"While the angels are courting they communicate by means of clicks made by their gills. This sound is quite audible as they seek out a spawning site. This search may take a week or two but eventually they will spend more and more time at one spot.

"The young angels are now in a learning situation. Often the first, second and third spawnings will be devoured; but usually each spawning lasts longer than the previous one as the parents gain experience. Some of the eggs will be infertile and they will turn white. Sometimes the parents will remove these, but not always. After 72 hours the young hatch and wriggle on the slate; but it will be another five to seven days before they are free-swimming. Once the eggs have hatched the parents will remove the fry to a new site—usually a leaf. This can be a very haphazard operation when an inexperienced pair are involved. It is not until they have fussed about in a con-

fused manner that a pattern begins to emerge. One parent carries young to the new nest, while the other remains at the old. When the mouthful of young have been laid safely on the new leaf the second fish takes up some fry and with one accord both parents move so that the returning fish is in sight of the old site while the parent carrying young has the new nest in view, thus cutting down the time the fry are at risk.

"When the young become free-swimming the parents rush about retrieving the swimmers and depositing them on the leaf until, from very exhaustion, they give up and accept that their family is mobile. At this point one should take out the decoy fish. The young angels now resemble a cloud of midges as they hover over the head of the parent in charge. The off-duty parent is always alert to assist, but only the controlling parent signals the fry with twitches of the dorsal. If these are not heeded the straying youngster is caught up and spat back into the centre of the group. The careful aquarist will always put off the tank light but leave on the room light, so that the adults may see to collect the young into a group which is easily guarded during the night.

"At three weeks the fry assume angel shape and provided they are fed frequently can reach 1 in. in diameter in 12 weeks. They accept newly-hatched brine shrimps a few hours after becoming free-swimming. A wide variety of food should be offered as angels become addicted to one type and will suffer a check in growth when offered different food by a new owner.

"The adults should be removed if they show signs of spawning again or if they appear to be wearied by the fry. The parents are very brave and will attack the aquarist's hand or siphon tube with quite hard jabs of the snout. If one can encourage angels to bring up their fry naturally there is no



Cryptocoryne, Ludwigia and water sprite

more rewarding sight than a flotilla of young being paraded by proud parents."

Photograph 3 shows a variety of tropical plants. Please send me details if you have successfully cultivated any of the species shown.

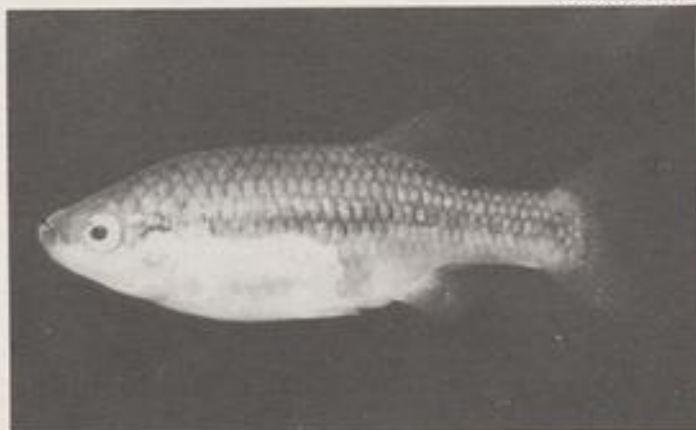
Master D. L. Lobb resides at 6 Thornton Close, Flore, Northampton, and writes: "I always read your *Plant Profile* articles with eager interest, and when I read your *Plant Profile No. 1*, on *Crimson nana*, through again, I decided to get hold of some. At the shop where I now work they were selling for 50p each so I bought three. I planted them as you did except that I used peat. Another very beautiful plant is *Nymphaea stellata*—often called the dwarf lily—which grows under similar conditions."

Mrs. Tina Wareham writes from 22 Chatsworth Avenue, Haslemere, Surrey: "The letter from Mr. Ray Holmes, in the May issue, prompted me to write. He was quite correct when he said that more readers should contribute. My husband and I

have been in the hobby for only a year now but we are absolutely hooked. Whilst writing this I'm watching our pair of blue gouramies spawning. What a fantastic experience it is: totally indescribable. They are in what was our original aquarium—40 in. x 12 in. x 15 in. It was an ordinary community tank but the remaining

occupants have been redistributed amongst our other tanks so that our gouramies could spawn. I have a small 18 in. x 12 in. x 12 in. bow-fronted tank, in my kitchen, containing a pair of zebra danios and red wagtail platies that we have had total success in breeding,

Xenotoca eiseni



in a full community tank with the assistance of the intrepid Java moss. Also, we have some *Xenotoca eiseni* with the platies and the danios. Though apparently prolific breeders we have had little or no success with these; but they do live well with our other fishes, which some people seem surprised at because they are, apparently, meant to be aggressive.

"In our living room we have the aforementioned gourami tank and a 48 in. x 20 in. x 24 in. plate-glass tank containing eight marbled angels which we are hoping to achieve good growth results from. Also sharing with these are a beautiful pair of scissortails, which were in our original community tank, and which are nearing full size and are hopefuls for the show bench as a breeder's pair at a later date. The other occupants are two ghost cats and an odd scissortail that was caught accidentally as a rummy-nose tetra at our local shop. We didn't realise until we got home but he has settled in well with the pair.

"Our final tank is the most active as it's stocked with small characins: black widows, serpaes, bleeding hearts, true bloodfins, gold tetras, neons, glowlights, black neons, head-and-tail lights, rummy-nosed tetras, flame tetras, ornate tetras and pencilfish. This tank is 48 in. x 12 in. x 12 in. and also contains a *Corydoras aeneus*. These fish are

mainly in pairs except for the glowlights and neons..." (Photograph 4 shows a *Xenotoca eiseni*).

Master Robert Robinson is 15 years old and was featured in *Meet the Aquarist*, in the July 1981 issue. He writes: "I'm just back from the Isle of Man where I visited the Marine Biological Station and Aquarium at Port Erin on the south coast of the island. There were quite a few large aquaria, some being quite dirty, but the fish looked content. Admission was free so I wasn't expecting too much. There isn't much on the Isle of Man to do with fishkeeping. I saw only two pet shops, neither having fish or accessories.

"My fish have all been doing well: none has died in a few months. The pond fish have been chasing each other through lilies and other plants. They have grown a lot because they have been eating a lot of flake food, insects and small pieces of steak. I never thought I would see the day when I would feed steak to goldfish! They are also very fond of earthworms. . . . I have been trying hard to photograph fish but with no success. Enclosed are a few of my disgusting efforts. What about your own fish and plants: still dying, are they?" (Master Robinson's photographs were not of the highest technical quality. The three prints showed, respectively, a moray eel, a starfish, and a variegated bamboo—

whatever that is. I knew the subjects because Robert had written labels on the reverse of each photograph. I liked his instructions on one of the three: "Please set on fire after viewing." I trust Master Robinson's sense of humour will be unnecessary when his 'O' level English language results appear in a couple of weeks' time. I entered some second year, fourth and sixth year boys and girls for 'O' level English language in June and may have to bury my head in a bag of gravel if they let me down. Perhaps I'll have to make use of my own wry sense of humour. I hope not.)

I'm writing this on 31st July after a delightful bout of sunny weather. My roses are in excellent condition but the ground is very dry because it has not rained for several weeks. I hope August will be equally sunny, dry and warm. I look forward to receiving your opinions on any of the following subjects knowing that you will be reading this in October and will have no excuse for not dropping me a few lines as the nights lengthen. The topics are: (a) outdoor pools; (b) breeding unusual livebearers; (c) feeding aquarium plants; (d) live foods for fish; (e) external filters; (f) light bulbs for aquarium use; (g) breeding smaller egg-layers; (h) cultivating *Aponogon* species; and (i) good and bad aquarium hoods.

It has begun to rain. Good-bye until next month.

OSCAR



G. Robinson

Your questions answered...

Tropical

tortoise care . . .

Can you give me some information on the care of land tortoises?

Unless your garden is walled, it will be necessary to build some sort of enclosure, as tortoises are great escape artists. Never drill a hole in a tortoise shell to tether it by a piece of string, or tether it by a hind leg. Site the enclosure in a grassy, sunny part of the garden, though tortoises must always have some access to some shade. Wooden boards (about 12-18 inches tall) that are partially sunk into the ground, make the best walls for a tortoise enclosure. Wire netting is not really suitable, since it makes climbing all the more easy for tortoises. Also incorporated into the enclosure must be a weatherproof box into which a tortoise can retreat in cold or damp weather, along with a shallow dish of water sunk to ground level. Tortoises do drink water and enjoy an occasional bath.

During the Spring and Summer months they should be fed a varied, plentiful diet of lettuce, soft cabbage leaves, dandelion, tomatoes, bananas and other over-ripe fruit. Certain plants (e.g. leaves of thubarb) should not be fed to tortoises and although some individuals appear to enjoy an occasional feed of bread and milk, it is not a good staple diet. Many tortoises also enjoy occasional feeds on lean raw meat, garden slugs, earthworms etc.

During the Autumn tortoises become less active and eventually stop feeding. By about mid-October they should be packed away for hibernation. Pack the tortoise loosely in a large box containing hay, straw or shredded newspaper. The box, along with the tortoise, should be stored over the winter in a cool frost free building where rats cannot get access to the sleeping reptile. A garage or an

unheated outhouse will do fine. The tortoise should be left undisturbed until the following spring, when it will show signs of awakening. The eyes, mouth, and nose should be bathed in warm water at this time, and the tortoise may appreciate a bath in shallow water. It will take a few weeks for the tortoise to become fully active again and it is a good idea to bring it indoors each night until all dangers of frost have passed.

hydra menace . . .

How can I get rid of *Hydra* from my tank?

These animals are often introduced into aquaria with live food. Up to several centimetres long, their body will (when disturbed) contract thus masking their characteristic many tentacled appearance. Using the tiny stinging cells in their tentacles, *Hydra* prey on live food and small fish and fish fry in the aquarium.

Controls measures include:

- (i) introducing fish such as gouramies which will prey on *Hydra*;
- (ii) using a six volt battery. Two pieces of insulated copper wire are connected to the battery, one to each terminal. The insulation from the other end of the wire is stripped away over several centimetres and these bare ends hung in the tank. When left in the tank for 3-6 hours, this should bring about the death of most of the *Hydra*—probably by copper poisoning. Immediately afterwards a 25%-50% water change must be carried out and all the dead *Hydra* removed via a syphon tube. Tap water conditioners such as *Aquasafe* should not be used in

TROPICAL



Dr. C. Andrews

COLDWATER



Arthur Boarder

an aquarium for a few days prior to this type of treatment.

mystus tenegra? . . .

Can you give me some information on *Mystus tenegra*?

This fish grows to about 18 cm. long, usually somewhat smaller in the aquarium. It is a relatively nocturnal species which requires plenty of hiding places in the aquarium and a temperature around 24°C. The composition of the water is not critical and the fish should be fed on 'safe' live foods, some freeze-dried foods and some tablet foods. As far as I am aware there are no external sexual characteristics and this fish has not yet been bred in the aquarium.

gouramies . . .

Can you give me some information on the care and breeding of moonlight gouramies?

Trichogaster microlepis grows to about 12-15cm in length, but should mature at about 8cm. They are quite common aquarium fish and relatively easy to breed—being a typical bubble-rester. These fish are not fussy over water conditions, although extreme values of pH and hardness should be avoided. A temperature around 25°C should be fine. Feed a good mixed diet based on good quality flaked foods. At a push you could keep a pair of these fish in a 18 in. x 10 in. x 10 in. tank, but I would go for a 24 in. x 12 in. x 12 in. aquarium. **C.A.**

PLANTS

Vivian De Thabrew

KOI

Hilda Allen

MARINE

Richard Sankey

DISCUS

Eberhard Schulze

Our experts are always pleased to receive your letters which should be addressed to: Readers Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN. All queries must be accompanied by a S.A.E.

Coldwater**sunfish . . .**

I have found that it is too expensive to heat my fish house and so I am thinking of keeping Sunfish. Can you tell me where I can get some please?

I am enclosing an address from where you should be able to get some. You must realise that these fishes are carnivorous, like our native Perch, and so live on live foods. It is often very difficult to get them to take dried foods. They like small fishes, worms and maggots. One experiment which you can make is to chop up garden worms and mix some flake food with it. As the fishes get used to taking this, it is possible to gradually reduce the amount of worms used.

goldfish . . .

I am interested in breeding some good quality fancy goldfish. I have some good quality Orandas and Fantails. Unfortunately the Orandas have turned out to be all males and the Fantails all females. I do not want to cross breed and shall be glad if you can let me know where I can get the fishes I require for proper pairing?

I have enclosed an address from where you should be able to get the fishes you need. If you can pay a visit to this establishment I am sure that you would find it well worth while. Only coldwater fishes are kept and bred and good quality fancy goldfish are stocked. I do not know what breeding space you have available

and if not too much, I suggest that you specialise in one variety only. Being able to provide plenty of swimming space for the fry is most important and also the chances of getting any cross breeds is avoided, by keeping one variety only.

bulging eyes . . .

I have a nine year old goldfish and have recently noticed that its eyes appear to be bulging slightly. Is there anything I can do to help the fish please?

A nine year old goldfish may be beginning to suffer from old age. It is comparable with a human being of seventy. Some live much longer but many do not. It depends on the conditions under which the fish has been kept. Some varieties of fancy goldfish have protruding eyes and if there happens to be such a fish in the background of your fish the eye trouble may have only just shown up. If the eyes are not inflamed nor show any signs there is no need to worry and the fish is best left alone.

rainbow dace . . .

Last year I bought a pair of American Rainbow Dace. I would like to breed from them and will be glad of any information you can give me?

I have never heard of American Rainbow Dace. This may be a local name for a particular fish as the Americans are very fond of giving local names to fishes found in their district. For instance, some of the Sunfish have ten or more names

given to them in various districts. There is a Rainbow Trout and a Rainbowfish. The former is found in America and will have a small adipose fin on the back near the tail. The Rainbowfish is found in Australia and has a small extra dorsal fin, close to the normal dorsal fin. I suspect that your fish are Rainbow Trout and if so you may find it impossible to get them to breed as these are river fish and spawn in the autumn in gravelly beds of rivers.

A.B.

Plants**filtration . . .**

I am going to set up a new aquarium, which I intend to try and maintain without the aid of filtration of any sort, relying solely on partial water changes, but other literature states this does not work, as over a period of time the substrate will foul up and kill both fish and plants. What is your opinion?

Plants in an aquarium do not require filtration at all, provided all their requirements are met, such as good lighting, suitable planting medium and water condition, etc. Check any algae growth and do partial water changes as necessary. A certain amount of debris can be useful as a fertiliser for the plants, but any excess amounts should be siphoned off before it upsets the biochemical balance of the tank. Hardy fish should survive and flourish in a well-planted tank using the system you are proposing, provided you don't overstock the tank or overfeed them, both of which would cause problems

and quickly pollute the water. However, more delicate species may require a certain amount of filtration, and you should consult your fish dealer on this point. My own tanks have no filtration at present, though certain plant species require aeration.



Cabomba caroliniana

I have a very small tank (18 in. x 12 in. x 12 in.) and an extremely limited budget. To economise on lighting I've put the tank next to a south-facing window, leaving the light off during the day and switching it on at dusk, so that in total a 12-hour day is simulated. Under these conditions *Vallisneria*, *Sagittaria* and *Cabomba* grow well and the fish are healthy.

However, part of the tank—say a sixth—receives little direct light—most is reflected off the glass and it remains rather dull during the day, although it is by no means dark. The above plants won't grow here. Are there some plants you can suggest I can plant in this area of slightly reduced light?

There are quite a few species which will grow satisfactorily in the shady area of your tank. Of the popular ones, the following are recommended: *Aponogeton crispus*, *undulatus*, and *rigidifolius*, *Cryptocorynes affinis*, *beckettii*, *nevillei* and *walkerii*, *Limnophila indica*, *Ludwigia* and *Microsorium pteropus*. Try some of these and see how they get on.

V.T.

Koi

koi spawnings . . .

I have been told locally that Koi do not breed in this country and I would like to know if this is true.

I am constantly amazed by the things I hear about Koi; obviously there is still a great deal of mystery (or ignorance) about the Japanese carp. Certainly Koi breed in this country.

Those who have the more expensive specimens of Koi may not be keen to see their Koi spawn and possibly suffer from split fins or a misplaced scale in the process. But if mature fish of both sexes are present, and the conditions are right, then spawning is a natural act, and we all know about the birds and bees.

Flock (natural) spawnings involving most of the fish are unlikely to produce many good Koi. Breeding from fish of the same variety is likely to produce better fish.

We must remember that whilst Koi are true carp, their colorations are man-made (but not 'hand-painted') and are a result of many years of skilled breeding in Japan. There will be a wide variety of shades and patterns, together with a fairly high percentage of nondescript types bearing little resemblance to the parents from an average spawning, and rigorous culling will be necessary.

This year especially a large number of successful Koi-spawnings have been reported from all parts of the country. They began in mid-May, no doubt triggered off by the unusually warm weather then following the coldest winter in living memory. Koi spawned then are now about 1½ to 2 inches long in July, raised in outdoor ponds. Hopefully they will be 4 to 6 inches before the onset of winter. Generally they are attractive, healthy little fish capable of giving real pleasure as they grow, although not likely to become Grand Champions.

It is a matter of regret to me that more of these sturdy home-bred youngsters are not readily available rather than some of the small Koi imported from various countries.

a pond liner . . .

The pond I am digging out will, I hope, end up as kidney-shaped and measure roughly 17 ft. x 10 ft., I dislike formal straight lines. I would like to know if it is possible to buy a custom-made liner to fit the excavation, to avoid the creases often so obvious in liner-ponds.

It may well be possible for you to order a Butyl liner specially made to fit your pond but this will obviously be an expensive item. Moreover, the specifications as supplied by you will be critical and impossible to rectify if mistakes are made or the fullest details not supplied.

I think it would be easier (and cheaper) for you to dig a basically rectangular pond and then order a box-welded liner to fit. I agree that folds are often a problem when liners in sheet form are used.

The general appearance, or outline of your pond can be softened according to your preference by the strategic positioning of large rocks, logs, or low-growing pines. Remember to check your levels, and ideally the water level should be at least 9-10 inches lower than the surround as a safeguard against the Koi jumping out, or being attacked by cats. Both can and do happen. Best wishes for your pond, you may well end up surprised by what a little flair and imagination can do when creating a Koi pond. I enclose the name and address of a specialist liner supplier.

H.A.

Marine

information . . .

I have just bought a 48 in. x 15 in. x 12 in. tank, to start a Tropical Marine Fish and Invertebrates tank. I don't want to rush it, but I would like to know the best way to set this size of tank up. I have been told different things from other people, some say I need four air lifts, I have a Rena 301 pump, would this be enough to run a tank of this size and 4 air lifts? I have been told to use Calcium plus under the

coral and coral sand, I would be very grateful if you could send me details of the best way, and the best pump for this size of tank. I have got undergravel filters and plenty of coral and coral sand. They have told me the deeper it is the better. And could you recommend a good book for marine beginners.

The establishing of a marine aquarium can be done in many different ways and if you find the advice you are receiving from aquarium shops is varied, this is generally caused by most shopkeepers having completely different ways and opinions. My advice would be to find the shopkeeper who, in your opinion, has the most successful marine fish themselves, not necessarily the shop that has the cheapest or has the highest turnover, but the shop where you know the proprietor has kept a number of marine aquariums for a long period of time. This way you are more likely to have success. Most of the books that are available are, unfortunately, very much out of date, and I would therefore suggest that if you read any such publications, that you take this into consideration, as you are entering a hobby that is progressing very rapidly.

By far the simplest method would be to use two conventional complete under gravel filter plates, with approximately 2-3 inches of coral sand. Coral sand acts as a superb biological filtration medium and an extremely efficient mechanical medium. The use of mixed filter mediums I do not generally recommend for the novice hobbyist, but instead suggest that regular partial changes of the coral sand to be by far the most simplest method, perhaps in an aquarium your size changing 10 lbs. of sand over 3-6 months. This way it is highly unlikely that the material will become clogged.

I am sorry my letter is a little negative but I cannot over emphasise to you the importance of good sound ongoing help and information from a local shopkeeper who really cares. I hope my letter has been of some use to you.

sweetlips . . .

I recently purchased a 2½ inch Clown Sweetlips which was housed

with a Clown Fish and Neon Damsel in a 22 gallon tank containing suitable hiding holes as I was informed that it was a rather shy fish.

I asked to see the Clown Sweetlips fed before purchasing it but was put off by the person in the Aquarists shop who said "they have just been fed" and assured me the fish was taking Blood Worm.

However, 3 days later after refusing Blood Worm, Mysis Shrimp and Brine Shrimp the Sweetlips was dead. As the Sweetlips had been more active after the aquarium lights were put out I had even tried feeding them in the hope it would eat and Marine Vita Appetite Stimulant was also used but to no avail; pH temperature, specific gravity and nitrite content were all O.K.

I have been keeping marines for 5 months but previously up until 1978 I had kept marines successfully for 3 years without losing one fish so I would not call myself a complete novice.

Both myself and my wife liked the Sweetlips so much we would like to replace it. Could you please give me any hints on its keeping. Also, do you recommend a good book on Marine fishes which states their requirements and gives hints on their keeping.

Firstly, let me say that Clown Sweetlips are a notoriously problematic species. They are often difficult to induce to feeding, and in some cases although they will start to feed, they have a terrible habit of not eating enough and simply gradually wasting away. If you are really set on this particular fish, may I advise you to purchase a fish between 3 and 4 inches in length and absolutely make sure the shopkeeper you buy it from shows you the fish feeding. Then at least you will have a good chance of growing the fish on. I suggest that you feed the fish a little but often, and bear in mind that the fish will grow and probably require a larger aquarium in less than a year.

As for general hints about keeping this particular fish. They prefer fairly fast moving water and bright light conditions, and in my opinion it is

wisest not to keep them with more greedy species as they will be less likely to get enough food. I sincerely hope this has given you enough information. **R.S.**

Discus

red discus? . . .

Re your letter: What is a 'RED' Discus fish?

A genuine RED Discus fish as such does not exist; one can find no mention at all in the classification according to SCHULTZ 1960, but they seem to appear from time to time. Therefore the above statement is only the 'half truth'. Many hobbyists seem to get very confused and often prefer to believe a label on an aquarium rather than their own eyes and judgement. A natural RED Discus fish is a 'bastard' Brown Discus fish from Brazil and these wild-caught specimens are very rare indeed. In the last 10 years or so of importing Discus fish from South America I have only ever seen three fish which could possibly be called 'REDS'.



Schmidt Focke TURQ x RED

Their markings are very much like the markings on a Brown Discus fish, except the whole body has an overall sheen of an orangy-red coloration. Personally, I can see nothing much in these fish, yet they demand a very high price and I know of certain Discus fish breeders willing to spend a small fortune for just one specimen.

I am sure what you and your local dealer call a RED Discus fish is a Far Eastern import where the red

coloration is artificially induced. They are basically Brown Discus fish fed with certain types of hormones or other colour inducing substances to make a perfect but boring looking baby Brown Discus fish more attractive and easier to sell. The obtained red coloration will usually disappear within a very short time and the poor hobbyist will be left with a Brown Discus fish for which he had to pay substantially more than his ordinary cousin would have cost. Often, as a result of the hormone treatment, these Discus fish are also infertile and having spent more than a year to bring these fish on, many a hobbyist, who, after all had visions of breaking the imaginary code of Discus fish breeding; seeing himself surrounded by millions of baby Discus fish, is so frustrated and disappointed that he very often will just give it all up.

I suppose it is fair comment to state that most serious Discus fish-keepers, breeders and suppliers stay away from this type of fish. These fish may fulfil a need, they may add to an aquarium a certain amount of colour where the alternative would have been no colour, they may make the hobbyist more aware of the real



A nice specimen of *Symphysodon discus* Willi Scharartzil

differences of the various strains of Discus fish, they may, in fact, encourage someone to start to keep these fish.

There are of course, certain types of colour strains bred by breeders in Europe and America where a RED coloration is the predominant colour on the fish and the most well known and sought after is Dr. E. Schmidt-Focke's 'Turquoise X Red' variety. These colours were achieved by line breeding over many generations and are fixed. The original stock of these types of fish all came from Manaus/Brazil and through the ceaseless efforts of many German breeders various types of fixed colour strains are

now available to hobbyists.

It is also known that a high iron content of the water will intensify the RED coloration in Discus fish: see Schmidt-Focke, *Aquarium Digest International*, No. 22, page 15. Experiments carried out by Pennock and Schulze in 1978 on *Symphysodon discus* Heckel with measured doses of Paprika given daily in the food over a period of 28 days also increased the intensity of the red coloration. After a break in the administration of Paprika the increased coloration slowly became fainter and after 15 days had completely gone. On repeating the experiment the coloration could be increased again and maintained as long as Paprika was given as a daily food supplement. The same experiments were carried out by Schulze on *Symphysodon aequifasciata axelrodi*, Schultz 1960, but no marked improvement of the red coloration could be noticed.

In conclusion let me say that any Discus fish is a wonderful animal and any hobbyist willing to start the keeping of the Discus fish should be encouraged: even if he or she decides to start with some of the so called REDS. **E.S.**

COMMENTARY

Continued from page 38

for the Triffid followers—and severe culling is often necessary at the height of the season. I do not recall ever having bought azolla: it seems that one or two stray pieces came in with some frogbit several seasons ago, and it has remained with us ever since. Quite apart from its interesting appearance its long thin roots and its peripheral nooks and crannies perform a useful service to fry of all kinds by offering them shelter from hungry predators. In this sense it is more effective than the native duckweeds, which are certainly better than nothing, but their leaves are usually round, which means poorer shelter, and they are eagerly

gobbled by vegetable-loving goldfish, which means fish salad. I have never seen azolla taken by my pool fish, though no doubt koi would have a fine time with it.

To ensure continuity I usually take in a handful in the autumn and float it in a container in an unheated greenhouse during the winter. I have known this to fail in past years for some unknown reason, and I usually put this down to unduly low temperatures. If left on a pond the average winter sees it off and I have always had to re-introduce in late spring. Last autumn I completely forgot to lay in an emergency stock, and as I had none on the indoor tanks either, it looked as though I would need to buy or scrounge this season. Last

year it did extremely well, and embarrassingly covered the Pit pool from edge to edge, to the extent that many bucketsful were consigned to the compost heap. The lowest temperatures we have ever experienced reduced the remainder to what looked like a red dust, and I was astonished to see some thriving groups of azolla a few weeks ago when I was moving some plants around. This is now spreading well, but how it ever survived those awful weeks of December and January, I shall never know. Presumably some safe microclimate beneath the deep snow cover just enabled a few spores to hold on, and the unusually kind spring did the rest.

NEWS...



From Aquarists' Societies

SOUTH EAST



THE Sudbury A.S. held their 10th annual open show at Nadder High School. Judges were P. Cottle, T. Waller, W. Dale, R. Reeves, D. Durrant, R. Paine, C. Pannell, A. Blake and K. Sackey.

Results: Class B: 1. A. Feast (Tonbridge); 2. J. Edwards (EKASG); 3. B. Witteridge (Sudbury); 4. C. Richards (Sudbury). C: 1. J. Edwards; 2. P. Moye (Heathrow Regis); 3. C. Richards; 4. M. West (Kingston). Ca: 1. H. Smith (Sudbury); 2. T. Gibson (Sudbury); 3. Mrs. P. Edwards (EKASG); 4. L. Brazier. Cb: 1, 2 and 3. P. Whidden (Tonbridge); 4. J. Richards (Leicester). D: 1. P. Moye; 2. J. Rowsey (Bakerheath); 3. P. Wilson (Sudbury); 4. A. Fuller (Kingston). Da: 1. W. Haines (Uxbridge); 2. C. Finnis (Stood); 3. P. Cox (Ruscombe); 4. M. Dardley (E. Dorswich). Db: 1. C. Richards; 2. R. Hart (Hounslow); 3. C. Finnis; 4. J. Rowsey. E: 1. C. Richards; 2. P. Moye; 3. Mrs. S. Smith (Sudbury); 4. R. Witteridge; 5. C. Richards. F: 1. J. Richards; 2. R. Somers (SELAS); 3. P. Sear (EKASG); 4. C. Richards. G: 1. P. Besson and C. Lerman; 2. J. Edwards; 3. W. Noble (Amersham); 4. C. Richards. H: 1 and 2. P. Moye; 3. B. Sellers (Gilling); 4. J. Edwards. J: 1. B. Witteridge; 2 and 3. J. Part (Rooftord); 4. M. Dardley. K: 1. P. Moye; 2. R. Somers; 3. D. Milnes (WDAS); 4. J. Richards. L: 1. J. Boyler (Ruscombe); 2. C. Richards; 3. A. Feast; 4. J. Powers (Basingstoke). M: 1. B. Witteridge; 2. Mr. and Mrs. W. Haines (Uxbridge); 3. S. Smith (Mid-Sussex); 4. A. Fuller (Kingston). Nb-m: 1. B. Witteridge; 2. M. Gibson (Sudbury); 3. Mrs. Edwards; 4. A. Fuller. Nv: 1. M. Clarke (Becknall); 2. T. Gibson; 3. C. Finnis; 4. J. Edwards. O: 1 and 3. P. Cox (WDAS); 2. P. Holding (WDAS); 4. M. Gibson. P: 1. C. Finnis; 2. M. Gibson; 3. P. Moye; 4. M. Dardley. Q: 1. C. Finnis; 2. M. Strange (Basingstoke); 3. Mrs. P. Edwards; 4. M. Gibson. R: 1. R. Somers; 2 and 3. H. Smith; 4. T. Laughlin (Haringey). S: 1. M. Dardley; 2. Mrs. C. D. Hunter (SELAS); 3. J. Smith (Mid-Sussex); 4. D. Hunter (SELAS). T: 1. C. Finnis; 2. M. Strange; 3. J. Edwards; 4. S. Furnesdown (WDAS). Xb-m: 1 and 3. F. Sear; 2. D. and P. Lambert (Kingston); 4. J. Edwards. Xv: 1, 2 and 3. C. Finnis; 4. S. Furnesdown. Y: 1. J. Part; 2. M. Dardley; 3. D. Mackay (Kingston); 4. I. Harvey (E. Dorswich). V: 1, 2 and 3. J. Pollard (Kingston); 4. D. and P. Lambert. W: 1. R. Hart (Hounslow); 2 and 3. P. Whidden; 4. I. Harvey. Highest pointed (visiting) society: Stood. Best fish in show and best egg-layer: C. Richards (Sudbury). Best livebearer: C. Finnis (Stood). FRAS Championship class: 1-B. Witteridge (Sudbury).

AFTER welcoming six new members and dealing with the usual club business at the August S.P.A.S.S. meeting, Gerry Herring chaired a special night dedicated to fish diseases. This is a topic that normally inspires lively discussion amongst fishkeepers and this was no exception. Old and new medicines were compared with good results being obtained by using such everyday substances as Dettol,

Savlon Cream, Iodine and of course Salt. In addition to modern specialist fish medicines and antibiotic treatments. The conclusion could be drawn that prevention is better than cure and a strict quarantine period for new stock with a suitable diet, clean and spacious conditions go a long way to avoiding problems. South Park Aquatic (Study) Society specialises in coldwater fishkeeping and meets at 8 p.m. on the third Tuesday of every month at the Washeldon Community Centre, St. George's Road, London SW19. New members and visitors always welcome. Full details from: Mrs. Marguerite Dudley, 183 South Park Road, Washeldon, London SW19 9RX. (Tel: 01-540 5662).

AT THE C.A.G.B. July meeting at York Library Hall, Wye Street, London S.W.11, members were given an insight on collecting fish, mainly Catfish from the River Niger, caught from the river near the town of Niamey. The evening was given over to Mr. R. Davis with excellent slides of both location shots and specimens of Catfish caught. In the local markets 20 inch long Catfish are displayed on hand-painted trays showing a variety of local fish that are to be caught in the area, and the average temperature is in the region of 104°F-112°F. To round off the evening they also had a visit from Mr. D. King, of Animal City who brought along a collection of live specimens of some of the large Catfish from his collection. The next meeting will be held on 13th September, to which they extend a welcome to any reader who would like to come along.

DARWIN'S theory of evolution was strongly debated by members of the **East Kent Aquatic Study Group** when they met at the Memorial Hall, Belling, Horne Bay, for their August meeting. The speakers were Andrew Aspinall and Andrew Round, two local Aquarists, who spoke about fish genetics. They demonstrated how inbreeding and mutation can cause the development or indeed the extinction of various species of fish. Judges for the August table show were John Edwards (Pisties) and Bill Francis (Reptiles/Amphibians). **Results:** Pisties: 1 and 2. C. J. Bridgeman; 3. M. Boulton; 4. V. Bird. Amphibians: 1 and 2. A. Bird; 3. S. Mason; 4. V. Bird. Reptiles: 1. S. Stebbins; 2. R. Spence; 3. L. Spore; 4. C. J. Bridgeman. 7. Spore; 8. Stebbins, the chairman was proud to show off the Silver Cup which this society won for highest pointed Club in Kent at this year's K.A.A.S. fish show. Membership of the Society continues to grow, the total now standing at over eighty. Meetings held on second Tuesday of each month.

A NEW South-Eastern Section of the **The British Kok-Keepers' Society** was formed on 15th August at Badgers Mount Cafe, Nr. Orpington, Kent, when 50-60 members turned up to vote for a very keen committee who will be organising films, slides and lectures at regular meetings every third Sunday in the month. The society will be helping members with their Kok problems and the interchange of information, so anyone interested from the Southern Counties may contact Mrs. Turner on Orpington 72833.

NEW SOCIETY
South East A.S. (SEAS) which is a new Society, meets at Hampton Football Club at 7.30 p.m. on the 1st and 3rd Mondays. Beginners and experts welcome; juniors too. Friendly atmosphere. For any enquiries ring Ken Condon on 941 1940.

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

SOUTH WEST



RESULTS the Bristol Tropical Fish Club's annual open show, held on 7th August at Messrs W. D. & H. O. With Recreational Hall, Bristol, were—Class B: 1 and 3. C. Richards; 2. R. Toose; 4. Mrs. K. Thoulson. C: 1. C. Richards; 2. H. G. R. Johnson; 3. G. Darby; 4. B. Witteridge. Cb: 1. B. Witteridge; 2. 3. and 4. C. Richards. Da: 1. Mrs. P. Cripps; 2. Mrs. I. Gale; 3. Mrs. K. Thoulson. Db: 1. R. Toose; 2 and 3. C. Curtis; 4. W. Holland. Dc: 1. P. Fitchett. Dd: 1. P. Cripps; 2. P. Fitchett; 3. Mrs. I. Gale; 4. Mrs. I. Hughes. Ea: 1. C. Richards; 2. B. Witteridge; 3. C. Curtis; 4. P. Fitchett. Eb: 1. C. Richards; 2. D. Spence; 3. Mrs. P. Cripps; 4. R. Witteridge. F: 1. J. Cripps; 2. and 3. J. Jackson; 3. W. Holland; G: 1. C. Richards; 2. R. Collier; 3 and 4. H. G. R. Johnson. H: 1. M. Harford; 2. A. Gale; 3. B. Witteridge; 4. H. G. R. Johnson. J: 1 and 2. B. Witteridge; 3. C. Richards; 4. D. Spence. K: 1. J. Jackson; 2. R. Collier; 3. Mrs. K. Thoulson; 4. M. Harford. L: 1. R. Collier; 2. P. Cripps; 3. D. Cox; 4. C. Richards. M: 1. R. Collier; 2. D. Cox; 3. Mrs. I. Gale; 4. A. Gale. N: 1. A. Gale; 2. P. Cripps; 3. P. Cox; 4. H. G. R. Johnson. O: 1, 2, 3 and 4. D. Cox. P: 1. and 4. D. Cox; 2 and 3. P. Cox. Q: 1. J. Jackson; 2. K. Thoulson; 3. R. Cummings; 4. B. Witteridge. R: 1. Mrs. P. Cripps; 2. R. Cummings; 3 and 4. D. Curtis. S: 1. H. G. R. Johnson; 2. J. Jackson; 3. R. Collier; 4. C. Curtis. T: 1. P. Cripps; 2. J. Jackson; 3. Mrs. M. Holland; 4. H. G. R. Johnson. XHM: 1. P. Cox; 2. J. Jackson; 3. P. Fitchett; 4. R. Cummings. XOT: 1. Mrs. P. Cripps; 2. Mrs. K. Thoulson; 3. P. Cox; 4. J. Jackson. Best exhibit, B. Witteridge. Highest individual points, C. Richards. Highest pointed club, Sudbury. F.B.A.S. Trophy, P. Cripps.

Wotton-Super-Mare A.S. first open show results—Group (Male): 1. F. Cox; 2. M. Thoulson; 3. K. Grace; 4. D. Cox. Group (Female): 1, 2 and 4. D. Cox; 3. P. Cox. Pisties (Coloured): 1 and 3. P. Cripps; 2 and 4. C. E. Curtis. Smoothtails: 1. and 2. D. Cox; 3. P. Thoulson; 4. K. Grace. Mollies: 1. R. Collier; 2. W. Holland. A.O.V. Livebearers: 1. P. Cripps; 2. R. Collier; 3. Mr. and Mrs. Curry. Barbs, Bartons: 1. K. Thoulson; 2. D. Fenton; 3. D. M. Foster; 4. N. Belcher. Barbs, Capons, Fantoms: 1. P. Cripps; 2. R. Pizzarello. Danios-Minnies: 1. A. Clouston; 2. M. Thoulson; 3. J. Vardelli; 4. P. Cox. Rasthars: 1. D. Spence; 2. J. Vardelli; 3. A. Belcher; 4. M. Thoulson. Bettas, Tree Loaches: 1. J. Vardelli; 2. R. Collier; 3. P. Cripps; 4. W. L. Rundle. Sharks, Labors: 1. D. Cox; 2. J. Sargent; 3. R. Collier; 4. T. Clouston. Hypoclinemus, Hemigrammus, Cichlids etc: 1. N. Benn; 2 and 3. P. Grace; 4. J. Hughes. A.O.V. Characins: 1. R. Collier; 2. W. L. Rundle; 3. D. Spence; 4. R. Cummings. Apistogramma, Neotomas, Polmatochromis, Pelvicachromis: 1. P. Fitchett; 2 and 4. C. E. Curtis; 3. J. Vardelli. Rift Valley: 1 and 2. J. Sargent. A.O.V. Cichlids: 1. P. Cripps; 2. Mr. and Mrs. Fitchett; 3. R. Pizzarello; 4. R. Cummings. Angels and Discus: 1. M. Thoulson; 2. P. Cripps. A.V. Anabantids including Spharai: 1. W. Clouston; 2. K. Grace; 3. R. Pizzarello; 4. N. Belcher. Fighters: 1. Mr. and Mrs. Fitchett; 2. R. Pizzarello.

Corydoras-Brochis-Aspidoras: 1, R. Collier; 2, D. Spence; 3, Mr. and Mrs. Pichet; 4, Mr. and Mrs. Curry. A.O.V. Catfish: 1, 2, 3 and 4, D. Spence. A.O.V. Tropical Freshwater: 1, R. Pincus. Toothcarp: 1, N. Belcher; 2, W. Holland. Sex Pairs-Livebearers: 1, F. Cripps. Sex Pairs (Egglayers): 1, D. Spence; 2, J. Verrdell; 3, A. Clapton; 4, R. Pincus. Breeders (Livebearers) (4 to team): 1, F. Cox; 2, F. Cripps; 3 and 4, D. Cox. Breeders (Egglayers) (4 to team): 1, Mr. and Mrs. Pichet; 2 and 3, R. Cummins. A.V. Simpedal Goldfish: 1 and 2, W. L. Runder; 3, J. Verrdell. Tropical Goldfish: 1, C. E. Curtis. A.O.V. Coldwater Fish: 1 and 2, J. Verrdell; 3, K. Thoulas. Junior class: any species: 1 and 2, A. Hughes; 3, I. Hughes; 4, M. Belcher. Highest Club Plymouth. Best in show: F. Cripps. S.A.A. Trophy (Kilian) N. Belcher.

THE extreme toxicity of Copper was underlined by H. C. B. Thomas, speaking to Bristol A.S. It was decided to neutralise Chlorine with Sodium Thiosulphate then it was suggested that four times as much Hypo should be used as the known concentration of Chlorine. Table Show Results:—Comets: 1, 3 and 4, P. Norman; 2, H. Thomas. Junior Class: 1 and 2, A. Hughes. Bristol A.S., the innovators of the Bristol Showbunkin, with long associations with the coldwater side of the hobby, meet on the second Tuesday of the month at St. Andrew Church Hall, Streetford Road, Whitehall at 7.30 pm. Advice and details from Vic Cole, 10 Hardwick Close, Bristol BS4 4NL (0272-711286).

AT the inaugural meeting of the South and West section of the Southern Livebearers Aquatic Group the following officers were elected: Chairman, N. Bending; Secretary, D. Lambert; Treasurer, G. Darlington; Vice-Chairman, I. Dibble. After the main business of the meeting there was an interesting lecture by Ivan Dibble.

MIDLANDS AND WALES



RESULTS of the Gloucester A.S. open show: Barbis: 1 and 2, G. Crumpton; 3, Mr. and Mrs. M. Griffiths; 4, D. Spence. Barbis: 1, M. and D. Homer; 2, M. Buchanan; 3, K. Thoulas; 4, Mrs. K. O'Nions. Characins: 1, P. and N. Watts; 2, K. Grace; 3, Mrs. B. May; 4, K. Thoulas. Characins: 1 and 2, Mrs. E. O'Nions. Characins: 1, Mr. and Mrs. Griffiths; 2, R. Collier; 3 and 4, M. and D. Homer. Angel Fish: 1, Mr. and Mrs. Perks; 2, Mrs. M. Thoulas. Dwarf Cichlids: 1 and 2, C. E. Curtis; 3, G. Crumpton; 4, K. Thoulas. A.O.V. Cichlids: 1, Mrs. R. Bond; 2, C. J. Hodgkinson; 3 and 4, P. Walker. Fighters: 1, R. A. Clark; 2 and 4, P. and N. Watts; 3, P. Johnson. A.O.V. Anabantids: 1, Mr. and Mrs. M. Griffiths; 2, M. Taylor; 3, M. and D. Homer; 4, J. T. Jordan. Egg-laying Toothcarp: 1, 2, 3 and 4, G. Crumpton. Tropical Catfish: 1, P. and N. Watts; 2, F. May; 3, K. Thoulas; 4, C. E. Curtis. Corydoras and Brochis: 1, D. C. Davies; 2, D. Spence; 3, Mrs. B. May; 4, Mrs. R. O'Nions. Rasbora: 1, D. Spence; 2, S. Clegg; 3, M. J. Jones. Danios and White Clouds: 1, K. Thoulas; 2, Mrs. B. May; 3, Mr. and Mrs. Griffiths; 4, Mrs. M. Thoulas. Loaches: 1, R. Collier; 2, Mr. and Mrs. L. Perks; 3, Mrs. R. Bond; 4, G. Crumpton. Sharks and Labror: 1, Mr. and Mrs. Yallop; 2, M. and D. Homer; 3, J. T. Jordan; 4, P. Johnson. A.O.V. Tropical Egg-layers: 1, P. and N. Watts; 2, G. Crumpton; 3, M. Buchanan; 4, M. R. Gray. Sexed Pairs: 1, G. Crumpton; 2, F. May; 3, T. Tapping; 4, Mrs. K. Thackway. Male Guppy: 1, K. Grace; 2, Mr. and Mrs. Yallop; 3, Mrs. M. Thoulas; 4, P. and N. Watts. Swordtail: 1, R. Collier; 2, Mrs. K. M. Thackway. Platies: 1, P. Taylor;

2 and 3, C. E. Curtis; 4, Mr. and Mrs. Yallop. A.O.V. Livebearers: 1, P. Law; 2, P. and N. Watts; 3, M. and D. Homer; 4, R. Collier. Showbunkin: 1, 2 and 3, R. H. Thackway; 4, Mrs. E. O'Nions. Single Tail Goldfish: 1, Mrs. M. R. Gray; 2 and 3, R. A. Clark; 4, M. and D. Homer. Tropical Goldfish: 1, C. E. Curtis; 2, F. Taylor; 3, Mrs. R. O'Nions; 4, R. A. Clark. A.O.V. Coldwater: 1, G. Crumpton; 2, K. Thoulas; 3, Mrs. R. Bond. Breeders (Egglayers): 1, G. Crumpton; 2, P. Taylor. Breeders (Livebearers): 1, Mrs. M. Thoulas; 2 and 3, P. Law.

London Trophy and Aquatic Gold Pin for Best in Show: P. and N. Watts, Class M (Protoperas annectens). Best Breeders: G. Crumpton, Class Xb-m (Barbus capipinnis). G.A.S. Trophy Exhibitor with Highest Points: P. and N. Watts, Class Ca (Hyphessobrycon minimus). Committee Cup for G.A.S. member with Highest Points: R. H. Thackway, Class Ub-Uc (Brevi Strobilina).

RESULTS of Llanrwst Major A.S. open show held on 12th June. Class A: 1, Miss D. Lewis (Llanrwst); 2, B. Witteridge (Sudbury); 3, C. Richards (Sudbury); 4, N. Bowyer (C.I.A.S.). Cat: 1, G. Turner (Llanrwst); 2, R. Witteridge; 3, J. Egan (Port Isaac, C.I.); 4, B. Witteridge; 5, J. Egan; 6, C. Richards; 7, I. Singletton (Llanrwst); 8, C. Richards; 9, D. J. B. Witteridge; 10, G. Phillips (Tresthomas); 11, D. Davies (Aberdare); 12, I. E. Spink (C.I.A.S.); 13, A. Hillman (Llanrwst); 14, K. Davies (C.I.A.S.). Dog: 1, C. Richards; 2, I. Singletton (Llanrwst); 3, J. Egan; 4, C. Richards; 5, J. Egan; 6, Miss D. Lewis; 7, B. Witteridge; 8, C. Richards; 9, J. Thomson (Llanrwst); 10, J. C. Richards; 11, N. Bowyer (C.I.A.S.); 12, I. C. Richards; 13, D. J. Paxon; 14, J. Egan; 15 and 16, S. D. C. Davies (Aberdare). By-Ty: 1, Miss E. Newton (Llanrwst); 2, J. C. Turner; 3, J. Egan; 4, B. Witteridge; 5, K. 1 and 2, N. Bowyer; 6, A. Robertson (Llanrwst); 7, N. Bowyer; 8, C. Richards; 9, B. Witteridge; 10, J. C. Richards; 11, C. Richards; 12, E. Spink (C.I.A.S.); 13, B. Witteridge; 14, B. Witteridge; 15, G. Turner; 16, C. Richards; 17, J. Thomson; 18, K. Davies; 19, I. L. Gregory (C.I.A.S.); 20, L. Gregory (C.I.A.S.); 21, A. E. Clark (Tresthomas); 22, J. I. Egan; 23, I. and 2, J. Egan; 24, N. Bowyer; 25, I. K. Davies; 26, N. Bowyer; 27, G. Lewis (Llanrwst); 28, J. N. Bowyer; 29, B. Witteridge; 30, S. Farnsworth (Walthamstow); 31, N. Bowyer; 32, C. Turner; 33, D. and P. Lambert (Kingston); 34, T. 1 and 2, D. and P. Lambert; 35, N. Bowyer; 36, U and Ur: 1 and 2, C. Turner; 3, B. Porter (C.I.A.S.); 4, V. I. B. Porter; 5, J. N. Bowyer; 6, Miss D. Lewis; 7, F. Spink (C.I.A.S.). Best in Show: B. Witteridge (Sudbury).

The Llanrwst Major A.S. meets on the 2nd Tuesday each month in the Clubroom, Lower Canon, Ham Lane, Llanrwst Major. Hon. Secretary: Mr. J. Baker, 79 Bishopwood, Brackla, Bridgend 6625B.

THE Leicester Aquarist Society Open Show, held on 1st August at St. Matthews Community Centre, Malabar Rd., Leicester, remains: Class B: 1, E. Witteridge (Sudbury); 2, R. M. Southurst and Son (Forest Town); 3, C. Richards (Sudbury); 4, G. Chamberlain (Leamington); 5, C. L. M. and B. Coe (Wellingborough); 6, J. Richards (Leicester); 7, B. Witteridge (Sudbury); 8, C. Richards; 9, I. C. Richards; 10, N. Bowyer; 11, C. Turner; 12, A. R. Smith (Leicester); 13, A. Brunell (Loughborough); 14, H. L. Sherriff (Wellingborough); 15, H. Sherriff (Wellingborough); 16, M. and B. Coe (Wellingborough); 17, B. Witteridge; 18, C. Wright (Kettering); 19, Mr. and Mrs. Hall (Canosack); 20, I. Godwin (Leicester New Parks); 21, R. M. Southurst and Son; 22, M. Wright (Kettering); 23, J. Richards; 24, M. and B. Coe; 25, I. C. Richards; 26, R. M. Southurst and Son; 27, B. Witteridge; 28, Mrs. S. Ashby; 29, C. Richards; 30, M. and B. Coe; 31, J. and A. G. Crumpton (Halesowen); 32, C. Richards; 33, G. L. C. Richards; 34, P. Borson (C. Llanrwst); 35, H. Evans (Canosack); 36, A. Waller (Southend); 37, J. Richards; 38, B. Witteridge; 39, A. Waller (Southend); 40, Mrs. C. Crook (Wolverhampton). Ha:

1, Mrs. C. Crook; 2, W. Hastings (Selis); 3, A. Gale (Sudbury); 4, J. Sherriff; 5, I. C. Richards; 6, R. M. Southurst and Son; 7, K. Hayes (Ipswich); 8, B. Witteridge; 9, I. and 4, R. Smith (Leicester); 10, W. Hastings (Selis); 11, D. Spink (Wolverhampton); 12, I. K. Smith; 13, G. Crumpton; 14, A. Hinds (Bedford); 15, C. Richards; 16, J. R. Wilson (Sudbury); 17, A. D. Jennings (Ipswich); 18, P. Chapman (London Transport); 19, R. M. Southurst and Son; 20, A. Brown (Bedford); 21, M. and B. Coe; 22, M. Such; 23, M. Gibson; 24, I. L. Godwin; 25, A. Gibson; 26, K. Hayes; 27, T. Godwin (Leicester); 28, O. J. H. Smith (Sudbury); 29, Mrs. W. Crumpton (Wolverhampton); 30, M. Gibson (Sudbury); 31, T. Laughlan (Haringey); 32, N. Boot (Leicester); 33, P. and R. Summers (Selis); 34, J. Orr (Sudbury); 35, S. Puffer (Hickley); 36, J. Orr (Sudbury); 37, I. and 4, R. Bryan (Kettering); 38, A. Waller; 39, W. Hastings; 40, I. C. Wainwright (Leicester); 41, N. Boot (Leicester); 42, P. and R. Summers (Selis); 43, D. Newman (Ipswich); 44, C. Smith (Sudbury); 45, A. Waller; 46, Mr. and Mrs. Lloyd; 47, J. Cochran (Northampton); 48, L. Godwin (Leicester New Parks); 49, H. Smith; 50, A. Brunell (Loughborough); 51, R. M. Southurst and Son; 52, A. Brown (Bedford); 53, M. Kirkham (Canosack); 54, K. Hayes (Ipswich); 55, M. Gibson (Sudbury); 56, I. K. Smith; 57, R. M. Southurst and Son; 58, G. Crumpton (Halesowen); 59, G. Crumpton; 60, I. Godwin; 61, U: 1 and 2, B. Tucker (Leicester); 62, Mrs. A. Nish (Bedford); 63, A. Mrs. G. M. Parker (Wellingborough); 64, I. and 3, B. Tucker (Leicester); 65, A. Wood (Bedford); 66, Mrs. G. M. Parker (Wellingborough); 67, I. A. Barton (Wellingborough); 68, M. Kirkham (Canosack); 69, D. Newman (Ipswich); 70, E. W. and L. C. Jays (Wolverhampton).

NEW SOCIETY

Central Aquatic Group have recently formed a new society. Any society wishing to find out more details should write to Mr. F. Wainwright, 66 Oakham Park, Goddard, Wolverhampton WV8 2BW. The Group was formed to assist societies and to organize social events and inter-society shows. At present five societies have joined the Group and at least 10 more have shown interest. This first year they are to hold a social evening and an inter-society for the member societies some time in October.

NORTH



RESULTS of Ashby Fishkeepers Society open show held on 1st August: Guppies: 1, Mr. and Mrs. Pickford (Ind.); 2, Mrs. Roe (Grimsby and Cleo.); 3, Mr. and Mrs. Brackbury (AFS); 4, Platies: 1, Miss L. Wilson (Grimsby and Cleo.); 2, Mr. and Mrs. Riley (Leeds FC); 3, Mr. and Mrs. Farrow (Lincoln); 4, Swordtails: 1, D. Barrett (BBC); 2, Mr. and Mrs. Colley (AFS); 3, E. Hickling (AFS); 4, Mollies: 1 and 2, Cambridge and Lister (AFS); 3, Mr. and Mrs. Pickford; 4, A.O.V. Livebearers: 1 and 2, D. Barrett (BBC); 3, Mrs. Anderson (Ind.); 4, Small Characins: 1, Mr. and Mrs. Riley; 2 and 3, Mr. and Mrs. Lake (Grimsby and Cleo.); 4, Large Characins: 1, Mr. and Mrs. Colley (AFS); 2, Mr. and Mrs. Stanzfield (Bedford); 3, Mr. and Mrs. Brackbury (AFS); 4, Endemic: 1, R. Lake; 2, P. Jackson (Aberdeen); 3, Mr. and Mrs. D. Mitchell (Lincoln); 4, Mr. and Mrs. Murray (Kestley); 5, Angels: 1, L. and N. Starbuck (Gastford); 2, A. Littlewood (Darfield); 3, Mr. and Mrs. M. Farrow; 4, Large Cichlids: 1, A. Smith (BBC); 2, K. M. Fisher (Forest Town); 3, Mr. and Mrs. Cuts (Grimsby); 4, Small Cichlids: 1, Mr. and Mrs. Brackbury; 2, Mrs. Bee; 3, H. Smith (Wyer); 4, Rasbora: 1 and 2, Mr. and Mrs. Lake; 3, D. Tetley (Bedford); 4, Danios and Minnows: 1, Mr. and Mrs. Newman (AFS); 2, Mr. and Mrs. Lake; 3, N.

Lowley (Aberdeen). Small Barbs: 1, Mr. and Mrs. Farrow (Lincoln); 2, I. Marshall (I & E); 3, Mr. and Mrs. Campbell (A.F.S.). Large Barbs: 1, Mr. and Mrs. Pickford; 2, H. Smith, A.V. Aphrodisiac: 1 and 2, Mrs. and Mrs. Cully, A.O.V. Killifish: 1, Mr. and Mrs. Lake; 2 and 3, Mr. and Mrs. Cully. Small Anabantids: 1 and 2, Mrs. Anderson (Ind.); 3, Mr. and Mrs. Lake. Large Anabantids: 1, Mr. and Mrs. Cully; 2, Mr. and Mrs. D. Mitchell (Lincoln); 3, Mr. and Mrs. D. Fighers; 4, G. D. Coxon (Turren, Turren); 5, Mrs. Anderson; 6, Mr. and Mrs. Riley. Corydoras and Brochis: 1, Mr. and Mrs. Anderson; 2, Mr. and Mrs. Lake; 3, L. and K. Starbuck (Castlerford). A.O.V. Catfish: 1, J. Marshall (I & E); 2, Hodgson and Jackson (Dorfield); 3, K. M. Fisher. Loaches and Botias: 1, L. and K. Starbuck; 2, Mr. and Mrs. Pickford; 3, N. Macbeth (Morley). Sharks and Foxes: 1, Mr. and Mrs. Marshall; 2, Mr. and Mrs. Brackbury; 3, J. Turner (Ind.). Small Tropicals: 1, Mr. and Mrs. Campbell (A.F.S.); 2, Mr. and Mrs. Riley; 3, J. Watkins (Ind.). Large Tropicals: 1, A. Smith; 2, Hodgson and Jackson. Pairs (Livebearers): 1, D. Barrett; 2, G. D. Coxon; 3, Crossidge and Lister. Pairs (Egglayers): 1 and 3, Mr. and Mrs. Lake; 2, S. Wilson (Ind.). Breeders (Livebearers): 'A & B': 1, G. D. Coxon; 2, Mrs. Bee; 3, Hodgson and Jackson. Breeders (Livebearers): 'C & D': 1, G. D. Coxon; 2, Mrs. Anderson; 3, Mr. and Mrs. Campbell. Breeders (Egglayers): 'A & B': 1, Mr. and Mrs. Brackbury; 2, N. Macbeth (Morley); 3, N. Lowley (Aberdeen). Breeders (Egglayers): 'C & D': 1 and 2, R. Todd (Grimshy-Clee); 3, D. Hoare (Ind.). A.O.V. Female (Livebearers): 1, Steven Wilson (Ind.); 2, Mr. and Mrs. Cully; 3, Miss L. Wilson (Grimshy-Clee). A.O.V. Female (Egglayers): 1, P. Jackson (Aberdeen); 2, Mr. and Mrs. Carr (Grimshy-Clee); 3, Mr. and Mrs. Brackbury. Common Goldfish (Comets): 1 and 2, Mr. and Mrs. Silk (Grimshy-Clee); 3, C. Carter (A.F.S.). Fancy Goldfish: 1, 2 and 3, Mr. and Mrs. Silk. A.O.V. Goldwater: 1 and 2, Mr. and Mrs. Silk; 3, Mr. and Mrs. Brackbury. Furnished Jarra-Tanks: 1, 2 and 3, Mr. and Mrs. Brackbury. Novelty Jars: 1 and 2, Mr. and Mrs. Brackbury; 3, Mr. Lancaster (Doncaster). A.V. Junior (Livebearers): 1, Steven Wilson; 2, and 3, Miss L. Wilson. A.V. Junior (Egglayers): 1 and 3, Spencer Stanfield (Bradford); 2, Miss L. Wilson. Best in Show: D. Barrett (A.O.V. Livebearers) (BBC). Best Pairs: D. Barrett (Pairs Livebearers) (BBC). Best Breeders (Egglayers): Mr. and Mrs. Brackbury (A.F.S.).

RESULTS of the G.C.A.S. open show: Livebearers: 1, D. Barrett; 2, Mr. and Mrs. Pickford; 3, Mr. and Mrs. Farrow. Swordtails: 1, D. Barrett; 2, P. Lane; 3, S. Harrison. Molies: 1, Mr. and Mrs. Lloyd; 2, D. Barrett; 3, R. M. Southworth & Son; 4, Mr. and Mrs. Lloyd. Large Barbs (over 10 cm.): 1, Mr. and Mrs. Pickford; 2, D. Overton; 3, Mr. and Mrs. Little. Characins: 1, Mr. and Mrs. Lake (Best Fish in Show). Small Characins (up to 10 cm.): 1, 2 and 3, Mr. and Mrs. Lake. Large Characins (over 7 cm.): 1, R. M. Southworth & Son; 2, Mr. and Mrs. Lake; 3, P. Burnett. Cichlids: 1, Mr. and Mrs. Pickford. A.O.V. Small Cichlids (up to 10 cm.): 1, Mr. and Mrs. Brackbury; 2, J. Howdon; 3, R. M. Southworth & Son. A.O.V. Large Cichlids (over 10 cm.): 1, Mr. and Mrs. Carr; 2, P. W. Hullett; 3, Mr. and Mrs. Newham. Angels: 1 and 2, Mr. and Mrs. Johnson; 3, L. Davidson. Endemic-Rift Lake Cichlids: 1, Mr. and Mrs. Pickford; 2 and 3, Mr. and Mrs. Mitchell. Catfish: 1, F. Wilson. Corydoras and Brochis: 1, F. Wilson; 2, Mr. and Mrs. Lake; 3, Mr. and Mrs. Newham. Catfish: 1, Mr. and Mrs. Howell; 2, Mr. and Mrs. Hays; 3, Mr. P. Minchley. Loaches and Botias: 1, Mr. and Mrs. Howell; 2, Mr. and Mrs. Lake; 3, N. and P. V. Noble. Sharks and Foxes: 1 and 2, Mr. and Mrs. Howell; 3, Mr. and Mrs. Brackbury. Anabantids: 1, Mr. and Mrs. Howell. Small Anabantids (up to 10 cm.): 1, R. M. Southworth & Son; 2 and 3, Mrs. Anderson. Siamese Fighters: 1 and 2, Mr. and Mrs. Brackbury; 3, Mrs. Anderson. Large Ana-

bantids (over 10 cm.): 1 and 2, Mr. and Mrs. Howell; 3, Mr. and Mrs. Cully. Common Goldfish: 1 and 2, Mr. and Mrs. Silk. Fancy Goldfish: 1 and 2, Mr. and Mrs. Silk; 3, B. and G. A.O.V. Goldwater: 1, T. Reid; 2, Mr. and Mrs. Lloyd; 3, Mr. and Mrs. Silk. Aphrodisiac: 1, L. Tusworth; 2, Miss P. Lane; 3, Mr. and Mrs. Farrow. A.O.V. Killifish: 1, L. Tusworth; 2, Mr. and Mrs. Lake; 3, Mr. and Mrs. Johnson. Danios and Minnows: 1, 2 and 3, Mr. and Mrs. Lake. Rasbora: 1, Mr. and Mrs. Hays; 2, K. Fisher; 3, Mr. and Mrs. Lake. A.O.V. Tropicfish: 1, Mr. and Mrs. Howell; 2, M. Black; 3, K. Fisher. Marinas: 1 and 2, J. Fuller. Pairs (Egglayers): 1, Mr. and Mrs. Hays; 2, M. Gilbert; 3, Mrs. Anderson. Pairs (Livebearers): 1 and 3, N. and P. V. Noble; 2, D. Barrett. Novias: 1, M. Gilbert; 2, Mr. and Mrs. Pickles; 3, Miss T. Holberg. Breeders (Egglayers): 'A & B': 1 and 2, Mr. and Mrs. Brackbury; 3, L. Tusworth. Breeders (Egglayers): 'C & D': 1 and 3, R. Todd; 2, Mrs. Anderson. Breeders (Livebearers): 'A & B': 1, Mr. and Mrs. Lloyd; 2, B. Bay; 3, G. D. Coxon. Breeders (Livebearers): 'C & D': 1, Mrs. Anderson; 2, P. Lane; 3, D. Barrett. Junior: 1, M. Southworth; 2, S. Riley; 3, J. and K. Johnson.

WINNERS at St Helens A.S. open show at Russell Village Hall on 27th June (there were 303 exhibitors)—Guppies: 1, Mr. and Mrs. Stephenson (Merseyside); 2, S. Jones (St. Helens); 3, S. Whiting (Ind.). Platies: 1, M. and I. Crowther (Nelson); 2, J. and K. Corbett (Merseyside); 3, K. Buckley (Bridgewater). Molies: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, S. Jones (St. Helens); 3, P. Graham (Nelson). Swordtails: 1, Mr. and Mrs. Marshall (Merseyside); 2, Mr. and Mrs. Baldwin; 3, B. W. Carter (St. Helens). A.O.V. Livebearers: 1, M. and N. Rimmer (Sandgrounders); 2, J. and K. Corbett; 3, C. Nicholls (Ind.). Small Anabantids: 1 and 3, M. Hartley (Sandgrounders); 2, Mr. and Mrs. Baldwin. Large Anabantids: 1, Mr. and Mrs. Underwood (Bridgewater); 2 and 3, M. Hartley. Fishers Multicolors: 1, A. Redman (Blackpool); 2, J. and K. Corbett; 3, C. A. Daniels (Blackpool). Small Barbs: 1, Mr. and Mrs. Goddard (Macclesfield); 2, Mr. and Mrs. Stephenson; 3, D. Milner (Darwin). Large Barbs: 1, Mr. and Mrs. Stephenson; 2, Mr. and Mrs. Baldwin; 3, W. and D. Hoare (Ind.). Dwarf Cichlids: 1 and 3, Mr. and Mrs. Underwood; 2, S. Tunnicliffe (Macclesfield). Large Cichlids: 1 and 2, Mr. and Mrs. Underwood; 3, M. Pritchard (St. Helens). Rift Valley: 1, Mr. and Mrs. C. Norton (Sandgrounders); 2 and 3, Mr. and Mrs. Waterhouse (Merseyside). Angels: 1, Mr. and Mrs. Stephenson; 2 and 3, W. D. Hoare. Small Characins: 1 and 3, S. Waterhouse (Merseyside); 2, Mr. and Mrs. Baldwin. Large Characins: 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Underwood; 3, R. J. Payne (Merseyside). Topspawning 4 toothpicks: 1, S. Halpinny (Ind.); 2 and 3, K. Buckley. Bottom Spawning Toothpicks: 1, K. Buckley; 2 and 3, D. Parkinson (Stens). Danios: 1 and 3, Mr. and Mrs. Baldwin; 2, M. and N. Rimmer. Corydoras and Brochis: 1, P. Banks (St. Helens); 1, Mr. and Mrs. Stephenson; 2, Mr. and Mrs. Mulla (Merseyside); 3, B. W. Carter (St. Helens). Minnows: 1, R. J. Payne (Merseyside); 2, Mr. and Mrs. Baldwin; 3, M. and N. Rimmer. Gordons and Botias: 1, P. Banks (St. Helens); 2, J. T. Morris (Sandgrounders); 3, Mr. and Mrs. Baldwin. A.O.V. Catfish: 1, 2 and 3, J. T. Morris. Sharks: 1 and 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Stephenson. Foxes: 1, Mr. and Mrs. Stephenson; 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Goddard (Macclesfield). Loaches: 1, Mr. and Mrs. Underwood; 2, P. Hays (St. Helens); 3, Mr. and Mrs. Bibby (Sandgrounders). A.O.V. of Fish: 1, Mr. and Mrs. Baldwin; 2, A. and E. Berry (Bridgewater); 3, S. Halpinny (Ind.). Pairs Egglayers Under 3 in.: 1, P. Banks (St. Helens); 2, Mr. and Mrs. Baldwin; 3, B. W. Carter. Pairs Egglayers Over 3 in.: 1 and 2, J. T. Morris; 3, S. Waterhouse. Pairs Livebearers: 1, M. and N. Rimmer; 2, J. and K. Corbett; 3, A. and E. Berry. Breeders Live 1-10: 1, M. and I. Crowther (Nelson); 2 and 3, R. J. Payne (Merseyside). Breeders Live 11-20: 1, M. Hartley. Breeders Eggs 1-10: 1 and 2, K. Buckley; 3, J. T. Morris (Sandgrounders). Breeders Egg 11-20: 1, K. Buckley; 2 and 3, J. T. Morris. Breeders Goldwater: 1, A.

and E. Berry; 2 and 3, R. Tack (St. Helens). Common Gold Fish: 1, Mr. and Mrs. Underwood; 2, S. Slater (Blackpool); 3, J. Doo (St. Helens). Shubunkins: 1, A. and E. Berry; 2, J. Lynch (Merseyside); 3, M. and I. Crowther (Nelson). A.V. Totaal: 1 and 2, Mr. and Mrs. Underwood. A.O.V. Goldwater: 1, A. and E. Berry; 2, P. Slater (Blackpool); 3, R. Tack. Any variety Marine: 1, P. Banks (St. Helens); 2 and 3, B. Leyland (St. Helens). Ladies any variety: 1, Mrs. Baldwin (Sandgrounders); 2, J. Slater (Blackpool); 3, Mrs. Bibby (Sandgrounders). Minjar: 1, 2 and 3, Mr. and Mrs. Stephenson. Junior Goldwater: 1, Mrs. P. Underwood (Bridgewater); 2, C. Berry (Bridgewater); 3, Miss J. Baldwin (Sandgrounders). Junior Livebearer: 1, Miss J. Baldwin; 2, S. Waterhouse (Merseyside); 3, A. M. Rodman (Blackpool). Junior Egglayer: 1, Miss J. Baldwin; 2, M. Carter (St. Helens); 3, Miss P. Underwood. Best in show: A. Underwood (Bridgewater). Best pair: M. and N. Rimmer (Sandgrounders). Best Breeder: K. Buckley (Bridgewater).

RESULTS at the Yorkshire Association of Aquarist Societies Festival held at Doncaster Race Course 21st and 22nd August: Tableaux: 1, Sheaf Valley Society; 2, Pocklington Society; 3, Ashby Fishkeepers Society; 4, Darfield Society; 5, Bradford and District Society. Fish of Fishes: 1, Mr. and Mrs. Waterhouse (Merseyside); 2, Mr. and Mrs. Goddard (Sheaf Valley); 3, D. Barrett (BBC). Best fish in show: T. Stanfield (Oswest). Best Exhibit: D. Gow (Darwen). Society with most points: Ashby Fishkeepers. Classes—Freshwater: Furnished Aquarium: 1, Darwin (A.S.); 2, Sheaf Valley; 3, Huddersfield. Tropical Freshwater Furnished Aquarium: 1, F. Toyne (Sheaf Valley); 2, Mr. and Mrs. Brackbury (Ashby Fishkeepers); 3, Mrs. M. Wood (Chesterfield). Aquascapes Individual Entry: 1, Mr. and Mrs. Brackbury (Ashby); 2 and 3, J. H. Hall (Aireborough). Novelty Individual Entry: 1 and 3, K. Lancaster (Doncaster); 2, P. Bateman (Wakefield). Guppies: 1, 2 and 3, T. Stanfield (Oswest). Platies: 1, P. Briscoe (Workington); 2, Mr. and Mrs. Brackbury (Ashby); 3, R. and A. Johnson (Piscine). Molies: 1, J. Lynch (Merseyside); 2, M. Croft (Workington); 3, Cranidge and Lister (Ashby). Swordtails: 1, D. Sapper (Bradford); 2, Mr. and Mrs. Brackbury (Ashby); 3, Mr. and Mrs. Marshall (Merseyside). A.O.V. Livebearers: 1, T. Stanfield (Oswest); 2, Cranidge Lister (Ashby); 3, A. Danby (Piscine). Small Barbs (up to 10cm): 1, B. R. Walker (Merseyside); 2 and 3, A. Goddard (Piscine). Large Barbs (over 10cm): 1, M. and L. Price (Oswest); 2, J. Graham (Workington); 3, I. Sykes (Huddersfield). Small Characins (up to 7cm): 1, Mrs. R. Mortenhead (Bradford); 2, D. Guller (Boston A.S.); 3, B. Parr (Piscine). Large Characins (over 7cm): 1, H. Hutchinson (Huddersfield); 2, Mr. and Mrs. Parr (Piscine); 3, D. Stubbs (Barnsley). Barbora: 1, A. D. Fisher (Bradford); 2, A. Goddard (Piscine); 3, Mr. and Mrs. Mulla (Merseyside). Danios: 1, D. Stubbs (Barnsley); 2, J. and K. Corbett (Merseyside); 3, D. Milner (Darwen). Minnows: 1, D. Milner (Darwen); 2, Mr. and Mrs. Fawcett (York). A.V. Aphrodisiac: 1, Mr. and Mrs. Tindall (York); 2, M. Croft (Workington); 3, H. Ackroyd (Doncaster). A.O.V. Killifish: 1, R. S. Colcock (Sheaf Valley); 2, A. Smart (Chesterfield); 3, M. and L. Price (Oswest). Siamese Fighters (true colours): 1, Mr. and Mrs. Brackbury (Ashby). Siamese Fighters (pale colours): 1 and 3, Mr. and Mrs. Brackbury (Ashby); 2, Mr. and Mrs. Fawcett (York). Small Anabantids (up to 10cm): 1, P. Griffiths (Mansborough); 2, A. Smart (Chesterfield); 3, Mr. and Mrs. Campbell (Ashby). Large Anabantids (over 10cm): 1, T. Stanfield (Oswest); 2, Mrs. R. Mortenhead (Bradford); 3, Mr. and Mrs. D. Panny (Mansborough). Endemic Rift Lake Cichlids: 1, D. Stubbs (Barnsley); 2, Mr. and Mrs. Waterhouse (Merseyside); 3, B. Dutton (Haber). Angels: 1, Mr. and Mrs. Tooby (York); 2, R. Foster (Grimshy-Clee). A.O.V. Cichlids (up to 10cm): 1, Mr. and Mrs. Brackbury (Ashby); 2, Mr. and Mrs. M. Brunson (Doncaster); 3, R. A. Johnson (Piscine). A.O.V. Cichlids (over 10cm): 1, T. Stanfield (Oswest); 2, T. and K. Corbett (Merseyside); 3, Mr. and Mrs. Slat (Pockling-

ton). Corydoras including Brochis: 1, J. and K. Corbett (Merseyside); 2, R. A. Johnson (Piscine); 3, Mr. and Mrs. Parr (Piscine). A.O.V. Catfish Announced: 1, D. Golland (Sheaf Valley); 2, R. J. and M. A. Lack (Ashby); 3, E. R. Walker (Merseyside). A.O.V. Catfish Named: 1, D. Stubbs (Barnsley); 2, Mr. and Mrs. Parr (Piscine); 3, Chadwick (Doncaster). Botas & Louches: 1 and 2, M. Richardson (Pocklington); 3, K. Hauser (Wokington). Sharks: 1, G. Wigglesworth (Darfield A.S.); 2, R. Mortzenhead (Bradford); 3, H. Hutchinson (Huddersfield). Pairs: 1, Mr. and Mrs. Mulla (Merseyside); 2, A. Matthews (Sheaf Valley); 3, A. Joyce (Chatterfield). Pairs (Livebearers): 1 and 2, E. K. Corbett (Merseyside); 3, A. Armstrong (Wokington). Pairs (Egglayers): 1, E. R. Walker (Merseyside); 2, A. Goddard (Piscine); 3, M. and L. Price (Dusett). Breeders (Livebearers): 'A': 1, A. Hodgson (Darfield); 2, Mr. and Mrs. Fawcett (York); 3, H. Adcock (Doncaster). Breeders (Livebearers): 'C': 1, Mr. and Mrs. Campbell (Ashby). Breeders (Livebearers): 'D': 1, R. L. Payne (Merseyside); 2, M. and L. Price (Dusett); 3, K. Prindagast (Boston A.S.). Breeders (Egglayers): 'A': 1 and 2, D. Milner (Darwen); 3, Mr. and Mrs. Fawcett (York). Breeders (Egglayers): 'B': 1, J. Sanders (Huddersfield); 2, D. Stubbs (Barnsley). Breeders (Egglayers): 'C': 1, Mr. and Mrs. N. Bolton (Pocklington); 2, D. Milner (Darwen); 3, T. Wheelwright (Holton). Breeders (Egglayers): 'D': 1, D. Gow (Darwen); 2, Mr. and Mrs. Waterhouse (Merseyside); 3, E. Dainton (Holton). A.V. Female Livebearers: 1, D. P. Griffiths (Mexborough). A.O.V. Female Livebearers (Boston A.S.): A.V. Female (Egglayer): 1, Mr. and Mrs. Brackensby (Ashby); 2, Mr. and Mrs. Campbell (Ashby); 3, A. Smart (Chatterfield). A.O.V. Tropical: 1, A. Hodgson (Darfield); 2, P. Griffiths (Mexborough). A.O.V. Marine: 1, Mr. and Mrs. D. Punny (Mexborough). Native Marine: 1, Mr. and Mrs. G. Flint (Doncaster). Common Goldfish and Comets: 1 and 2, K. Chapman (Mexborough); 3, M. Gray (Hull). Shubunkins, Bristles, and London: 1, Mr. and Mrs. Dearing (York); 2, R. and D. Parr (Piscine); 3, D. Silk (Gimingham). Fancy Goldfish, Moors, P/Tails, Dean, and L-Heads: 1 and 2, B. L. Lisle (Mexborough); 3, Mrs. C. Toyne (Sheaf Valley). Breeders Goldwater: 1 and 2, B. Lisle (Mexborough); 3, L. Waller (Chatterfield). A.O.V. Goldwater: 1 and 2, D. Silk (Gimingham); 3, C. and S. Waller (York). Aquarium Plants: 1 and 3, Mr. and Mrs. Brackensby (Ashby E.K.); 2, J. Leman (Hole). Amphibians, and Terrapins: 1, Miss A. Stanfield (Dusett); 2, K. Taylor (Hull); 3, N. Lawley (Aerborough). Crabs, Shrimps, and Lobsters: 1, Mr. and Mrs. G. Flint (Doncaster).

RESULTS of the Hull A.S. show at East Park, Hull on 31st July: Guppies: 1, C. S. Vernon (Wyke); 2, K. Riley (Lords P.O.); 3, B. D. Tyler (Hull). Swordtails: 1, G. A. Todd (Hull); 2, P. Davies (Wyke). Platies: 1, Mr. and Mrs. Riley (Lords P.O.); 2 and 3, D. Dalton (Wyke). Mollies: 1, G. A. Todd; 2, Mr. and Mrs. Frisby (Wyke). A.O.V. (Livebearers): 1, C. S. Vernon; 2 and 3, Mr. and Mrs. Frisby. A.V. (Female Livebearers): 1, Mr. and Mrs. Frisby; 2, B. Anderson (Ld.); 3, A. Walton (Hull). Pairs (Livebearers): 1, Mr. and Mrs. Frisby; 2 and 3, G. A. Todd. Breeders (Livebearers): 'C & D': 1, B. Anderson; 2, C. S. Vernon. Rasboras: 1 and 2, Mr. and Mrs. Lake (Grimsby and Cleethorpes); 3, Mr. and Mrs. Frisby. Danios and Mazonovs: 1 and 2, Mr. and Mrs. Lake; 3, Mr. and Mrs. Frisby. Barbs (up to 10 cm.): 1 and 3, L. Barker (Wyke); 2, B. Anderson. Barbs (over 10 cm.): 1, Mrs. Burrows (Hull); 2, I. Giddings (Wyke). Angels: 1 and 2, D. J. Waterson (Hull). Rift Valley (Bodman): 1, I. Giddings (Wyke); 2 and 3, Mr. and Mrs. Frisby. A.O.V. Cichlids (up to 10 cm.): 1, L. Barker; 2, A. J. Taylor (Wyke); 3, Mr. and Mrs. Riley. A.O.V. Cichlids (over 10 cm.): 1 and 2, Mr. and Mrs. Frisby; 3, M. A. Anguish (Withernsea). Characins (up to 7 cm.): 1 and 2, Mr. and Mrs. Lake; 3, A. J. Taylor. Characins (over 7 cm.): 1, B. Anderson; 2, I. Giddings; 3, Mr. and Mrs. Frisby. Fighters (Male or Female): 1, B. Anderson; 2, Mr. and Mrs. Riley; 3, L. Barker. Anabantids (up to 10 cm.): 1, B. Anderson; 2, Mr. and Mrs. Riley; 3, S. R. Wilson (Hull). Anabantids (over 10 cm.): 1 and 3, A. J. Taylor; 2, D. J. Waterson (Hull). Egglaying

Toothcarp: 1, Mr. and Mrs. Lake; 2 and 3, R. Willerton (Hull). Corydoras: 1, Mr. and Mrs. Lake; 2, Mr. and Mrs. Riley; 3, M. Miles (Hull). A.O.V. Catfish: 1, C. S. Vernon; 2, A. Walton; 3, Mr. and Mrs. Frisby. Loaches: 1, Mr. and Mrs. Lake; 2, Mr. and Mrs. Frisby; 3, S. A. and B. Pearson (Hull). Sharks and Pikes: 1, S. A. and B. Pearson; 2, M. Miles (Hull). A.O.V.: 1, Mr. and Mrs. Frisby; 2, Mr. and Mrs. Riley; 3, M. A. Anguish (Withernsea). A.V. Female (Egglayers): 1, Mr. and Mrs. Lake; 2, Mr. and Mrs. Frisby; 3, B. Anderson. Pairs (Egglayers): 1, Mr. and Mrs. Lake. Breeders (Egglayers): 'A & B': 1, I. Giddings. Breeders (Egglayers): 'C & D': 1 and 2, C. S. Vernon; 3, Mr. and Mrs. Silk (Gimingham). Goldfish and Comets: 1, M. Gray (Hull); 2, E. and J. Merion (Hull); 3, Mr. and Mrs. Silk. Fancy Goldfish: 1, 2 and 3, Mr. and Mrs. Silk. A.O.V. Goldwater: 1 and 3, Mr. and Mrs. Silk; 2, C. S. Vernon. Best Furnished Aquarium: 1, G. A. Todd (Hull); 2, M. Gray; 3, S. Wilson. Best Fish in Aquarium: 1, M. Gray. Best Fish in Show: 1, Mr. and Mrs. Frisby (Gold Star award, 79 points).

RESULTS of the Oldham & District A.S. open show held on 28th August: Guppies: 1, M. Whiting (North Salford); 2, A. M. Redman (Blackpool); 3, Mr. and Mrs. Stevenson (Oldham). Mollies: 1, M. I. Crowther (Nelson); 2, P. Graham (Nelson); 3, J. Lynch (Merseyside). Swordtails: 1 and 3, Mr. and Mrs. Marshall (Merseyside); 2, M. Carter (St. Helens). Platies: 1 and 3, M. I. Crowther; 2, R. L. Payne (Merseyside). A.O.V. Livebearers: 1, J. and K. Corbett (Merseyside); 2, M. and N. Rimmer (Sandgrounders); 3, C. Nicholls (Independent). Sandgrounders: 1, Mr. and Mrs. Underwood (Bridgewater); 2, K. Buckley (Bridgewater); 3, A. Holden (Independent). Fighters: 1, A. M. Redman; 2, W. D. Hoare (Independent); 3, C. A. Scoble (Blackpool). Small Barbs: 1, R. Scoble (Oldham); 2, Mr. and Mrs. Stevenson (Oldham); 3, J. Whittaker (Bridgewater). Large Barbs: 1, Mr. and Mrs. Stevenson; 2, J. Lynch; 3, Mr. and Mrs. Baldwin (Sandgrounders). Dwarf Cichlids: 1 and 2, Mr. and Mrs. Underwood; 3, R. L. Payne. Large Cichlid: 1, Mr. and Mrs. Underwood; 2, Mr. Elliott (Oldham); 3, P. Clayton (Piscine). Angels: 1 and 2, W. D. Hoare; 3, Mr. and Mrs. Stevenson. Rift Valley Cichlids: 1 and 2, Mr. and Mrs. Waterhouse (Merseyside); 3, Mrs. Baldwin (Sandgrounders). Small Characins: 1, E. B. Calow (Bridgewater); 2 and 3, Mr. and Mrs. Baldwin. Large Characins: 1, Mr. and Mrs. Stevenson; 2 and 3, Mr. and Mrs. Underwood. Rasboras: 1, Mr. and Mrs. Stevenson; 2, Mr. and Mrs. Mulla (Merseyside); 3, P. and S. Spencer (Piscine). Danios: 1 and 2, Mr. and Mrs. Baldwin; 3, J. and K. Corbett. Mazonovs: 1, S. Thomlinson (Macclesfield); 2 and 3, Mr. and Mrs. Baldwin. Sharks: 1 and 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Baldwin. Flying Fish: 1, Mr. and Mrs. Stevenson; 2, R. L. Payne; 3, Mr. and Mrs. O'Rourke (Oldham). Toothcarps: 1, R. Scoble (Oldham); 2, L. M. Buckley (Bridgewater); 3, S. Thomlinson (Macclesfield). Corydoras: 1, J. K. Corbett; 2, Mr. and Mrs. Baldwin; 3, M. and N. Rimmer (Sandgrounders). A.O.V. Catfish: 1, Mr. and Mrs. Waterhouse; 2, Mr. and Mrs. Baldwin; 3, J. T. Morris (Sandgrounders). Loaches and Botias: 1, Mr. and Mrs. Underwood; 2, Mr. and Mrs. Baldwin; 3, M. and N. Rimmer (Sandgrounders). Breeders (Egglayers): 'A': 1, K. Buckley; 2 and 3, J. T. Morris. Breeders (Egglayers): 'B': 1, K. Buckley; 2, Mr. and Mrs. D. Hale (Oldham). Breeders (Egglayers): 'C': 1, K. Buckley; 2, Mr. Drake (Aberdeen); 3, P. Darcy (Oldham). Breeders (Egglayers): 'D': 1, K. Buckley; 2, D. Milner (Darwen); 3, P. S. Spencer (Piscine). Breeders (Livebearers): 'C & D': 1, A. and E. Berry (Bridgewater); 2, R. L. Payne; 3, Mr. and Mrs. Baldwin. Breeders (Livebearers): 'A & B': 1, E. Burchwood (Oldham); 2 and 3, Mrs. and Mrs. Chadwick (Oldham). Pairs (Egglayers): 1, Mr. and Mrs. Goddard (Macclesfield); 2 and 3, J. T. Morris. Pairs (Livebearers): 1 and 3, M. and N. Rimmer; 2, J. K. Corbett. A.O.V. Tropical: 1, Mr. and Mrs. Baldwin; 2, A. and E. Berry; 3, J. and K. Corbett. Mini Jars (Furnished): 1, 2 and 3, Mr. and Mrs. Stevenson. Common Goldfish and Comets: 1, Mr. and Mrs. Chadwick (Oldham); 2, P. Slater (Sandgrounders);

3, Mr. and Mrs. Underwood. Shubunkins: 1, C. H. Whitley (Accrington); 2, A. E. Berry; 3, Mr. and Mrs. Hindle (Accrington). Parrotails: 1 and 2, Mr. and Mrs. Underwood; 3, C. Walbank (Accrington). Veiltails: 1, Mr. and Mrs. Colley (Oldham); 2, J. Lynch (Merseyside); 3, C. H. Whitley. Lombards: 1, Mr. and Mrs. Hindle (Accrington); 2, S. Walsh (Accrington); 3, C. H. Whitley. Moors: 1, M. Agnew (Boston); 2, Mr. and Mrs. Chadwick (Oldham); 3, Mr. and Mrs. Colley (Oldham). Gouramis: 1, Mr. and Mrs. Hindle; 2, C. H. Whitley; 3, Mr. and Mrs. Colley. A.O.V. Fancy (Goldwater): 1, Mr. and Mrs. Colley; 2, C. H. Whitley; 3, V. Scoble (Oldham). A.O.V. Asian or U.S.A. (Goldwater): 1, S. Walsh (Accrington); 2, Mr. and Mrs. Walsh (Accrington); 3, C. Walbank (Accrington). A.O.V. European (Goldwater): 1, P. Wade (Oldham); 2, A. and E. Berry (Bridgewater); 3, D. Milner (Darwen). A.V. Marine: 1, S. Lavender (Stratford).

Statesmen's League held at Hull. Results: Guppies: 1 and 2, B. D. Tyler (Hull); 3, A. Clark (Brad. Mandy); 1, S. L. Walton (Hull); 2, G. A. Todd (Hull); 3, D. Frisby (Wyke). Swords: 1, 2 and 3, M. and P. Jordan (Brad.). Platies: 1, D. Agar and D. Cullen (Brad.); 2, G. Andrews (Hull); 3, E. Sanders (Hull). A.O.V. Livebearers: 1, T. Smith (Brad.); 2 and 3, M. and P. Jordan. Barbs (up to 10 cm.): 1 and 2, P. and M. Richardson (York); 3, M. and P. Jordan. Barbs (over 10 cm.): 1, Ray Laverick (Wyke); 2, M. and P. Jordan. Characins (up to 7 cm.): 1, M. A. Waghorn (Brad.); 2, K. A. Nicholson (Brad.); 3, D. Agar and D. Cullen. Characins (over 7 cm.): 1, Mr. and Mrs. Ashton (Wyke); 2, Pate and Sylvia (Brad.); 3, D. Agar and D. Cullen. Dan. Dan. Mian.: 1, J. Walton (Ebor.); 2, Ray Laverick (Wyke); 3, E. Taylor (Brad.). Fighters: 1, 2 and 3, Mr. and Mrs. Fawcett (York). A.O.V. Cichlids (up to 10 cm.): 1 and 3, M. H. Smith (Wyke); 2, S. L. Walton (Hull). A.O.V. Cichlids (over 10 cm.): 1, Mr. and Mrs. Frisby (Wyke); 2, I. Giddings (Wyke); 3, I. Taylor (Brad.). Endemic Rift Lake Cichlids: 1, I. Taylor (Brad.); 2, Mr. and Mrs. Bolton (York); 3, Mr. and Mrs. D. Farrand (Brad. Acapta); 1, I. Giddings; 1 and 3, Mr. and Mrs. R. Vebby (York). Anabantids (up to 10 cm.): 1, Mr. and Mrs. Sise (York); 2 and 3, I. A. Pickering (Wyke). Anabantids (over 10 cm.): 1, D. Dalton (Wyke); 2, M. A. Waghorn (Brad.); 3, R. and M. Merry (Brad.). Corydoras and Brochis: 1 and 3, T. Smith; 2, Mr. and Mrs. Frisby. A.O.V. Catfish: 1, D. Agar and D. Cullen; 2, M. H. Smith (Wyke); 3, L. and V. Taylor (Brad.). Loaches: 1, 2 and 3, P. and M. Richardson (York); 2, A. V. Aphrosimone; 1, Mr. and Mrs. Tindall (York); 2 and 3, C. Matson (Hull); 3, N. Mason (Hull). A.O.V. Killifish: 1 and 2, Mr. and Mrs. Tindall; 3, C. Matson. A.O.V. Tropicals: 1, C. Matson; 2, S. Spencer (Brad.); 3, M. Miles. Breeders (Egglayers): 'A & B': 1, Mr. and Mrs. Farrand (Brad.); 2, Mr. and Mrs. Bolton (York); 3, Mr. and Mrs. Sise (York). Breeders (Egglayers): 'C & D': 1, Mr. and Mrs. Farrand; 2, Mr. and Mrs. Phillips (Hull); 3, Mr. and Mrs. Bolton (York). Breeders (Livebearers): 'A & B': 1, Mr. and Mrs. Fawcett; 2, I. Giddings. Breeders (Livebearers): 'C & D': 1 and 2, Mr. and Mrs. Fawcett; 3, M. and P. Jordan. Pairs (Egglayers): 1, M. and P. Jordan; 2, D. Agar and D. Cullen; 3, Mr. and Mrs. Fawcett. Pairs (Livebearers): 1, M. and P. Jordan; 2, C. Vernon (Wyke); 3, T. Smith. Goldfish and Comets: 1, M. Gray (Hull). Fancy Goldwater: 1, Mr. and Mrs. Frisby. A.O.V. Goldwater: 1, R. Proctor and Son (Wyke); 2, C. Matson; 3, M. and P. Jordan. A.V. Female (Egglayers): 1 and 3, Ray Laverick (Brad.); 2, G. A. Todd (Hull). A.V. Female (Livebearers): 1, Mr. and Mrs. Frisby; 2, M. and P. Jordan; 3, C. Andrews (Hull). Furnished Mini Jars: 1 and 2, Mr. and Mrs. Tindall (York); 3, E. Taylor (Brad.). Best in Show: 1, Taylor (Brad.). Total entries: 265. Scarborough Society were the judges. Society Points: Hull 36; York 51; Wyke 49; Ebor 3; Bridson 72.

Statesmen League held at Wyke. Results: Guppies: 1 and 3, B. D. Tyler (Hull); 2, Mrs. J. Walker (Scar.). Mollies: 1, G. A. Todd (Hull); 2, C. Colles (Scar.). A. Tilson (Scar.). Swordtails: 1, 2 and 3, M. and P.

Jordan (Brid.), Platics: 1, D. Dalton (Wyke); 2 and 3, G. Andrews (Hull); A.O.V. Livebearers: 1, M. and P. Jordan; 2, Mr. and Mrs. Fawcett (York); 3, T. Smith (Brid.). Small Barbs (up to 10 cm.): 1, E. Hodson (Scar.); 2, P. and M. Richardson (York); 3, Mr. and Mrs. Ellerker (Scar.). Large Barbs (over 10 cm.): 1, M. and P. Jordan; 2, Mr. and Mrs. Ellerker; 3, Ray Laverick (Wyke). Small Characins (up to 7 cm.): 1, D. Gregory (Scar.); 2, Colin Sowersby (Scar.); 3, W. Sowersby (Scar.). Large Characins (over 7 cm.): 1, Mr. and Mrs. Froby (Wyke); 2, K. Webb (Scar.); 3, Miss J. Walker (Scar.). Ras. Dam. Mosa. (1 and 2, Ray Laverick); 3, I. Giddings (Wyke). Fighters: 1, S. Smith (Scar.); 2, Mrs. S. Sowersby (Scar.); 3, Mr. and Mrs. Fawcett. A.O.V. Cichlids (up to 10 cm.): 1 and 3, M. Smith (Wyke); 2, W. Sowersby. A.O.V. Cichlids (over 10 cm.): 1 and 3, Mr. and Mrs. Froby; 2, Ian Taylor (Brid.). Rift Lake Cichlids: 1, Ian Taylor (Brid.); 2 and 3, Mr. and Mrs. Farrand (Brid.). Angels: 1, Mr. and Mrs. Tooby (York); 2, S. W. Gregory (Scar.); 3, Mr. and Mrs. Sloan (Scar.). Small Anabantids (up to 10 cm.): 1, Mr. and Mrs. Phillips (Hull); 2, Mr. and Mrs. Ellerker; 3, Mr. and Mrs. Sloan (York). Large Anabantids (over 10 cm.): 1, Miss J. Walker (Scar.); 2, K. Webb (Scar.); 3, C. and S. Waller (York). Cyprinids and Brochis: 1, E. Hodson (Scar.); 2, T. Smith (Brid.); 3, W. Sowersby. A.O.V. Catfish: 1, D. Agar and D. Cullen (Brid.); 2, M. Smith; 3, C. and I. (Wyke). Loaches and Botia: 1, 2 and 3, P. and M. Richardson (York). A.V. Aphroscion: 1, Mrs. S. Sowersby; 2 and 3, Mr. and Mrs. Tindall (York). A.O.V. Killifish: 1, S. Armstrong (Scar.); 2 and 3, Mr. and Mrs. Tindall. A.O.V. Tropical: 1, Mr. and Mrs. Ashton (Wyke); 2, Mr. and Mrs. Ellerker; 3, S. Pearson (Hull). Sharks and Pikes: 1, N. Nicholson (Brid.); 2, Mrs. K. Bagby (Scar.); 3, J. Fosson (Wyke). Breeders (Egglayers) 'A & B': 1, M. and P. Jordan; 2, Mr. and Mrs. Fawcett (York); 3, I. Giddings. Breeders (Egglayers) 'C & D': 1, 2 and 3, Mr. and Mrs. Farrand (Brid.). Breeders (Livebearers) 'A & B': 1, T. Smith; 2, I. Giddings; 3, Mr. and Mrs. Fawcett. Breeders (Livebearers) 'C & D': 1, M. and P. Jordan; 2, I. Giddings; 3, Mr. and Mrs. Fawcett. Pairs (Egglayers): 1 and 2, M. and P. Jordan; 3, W. Sowersby. Pairs (Livebearers): 1, M. and P. Jordan; 2, W. Sowersby; 3, Mr. and Mrs. Fawcett. Common Goldfish and Comet: 1, M. Gray (Hull); 2, D. R. House (Scar.); 3, W. Sowersby. Fancy Goldfish: 1 and 2, D. R. House; 3, R. D. Talbot (Brid.). A.O.V. Goldfish: 1, C. and S. Waller (York)—Bred (Fish); 2, Mr. and Mrs. Ellerker; 3, C. and S. Waller. A.V. Female (Egglayers): 1 and 2, Ray Laverick (Wyke); 3, G. A. Todd. A.V. Female (Livebearers): 1 and 2, T. Smith; 3, M. and P. Jordan. Parrotfish Mini Jars: 1 and 2, Mr. and Mrs. Tindall (York). Judging Society: Elec. Total Entries: 325.

Result: Beedington, 56; Hull, 19; Scarborough, 64; York, 41; Wyke, 36.

Blackburn Aquarist Waterlife Society offer a challenge to all societies in the Lancashire area. They are looking for new members both experienced and the beginner. They aim to be the society around. They meet on the first Tuesday each month at The Yuticks Nest, Blackburn at 8 p.m. There will be lectures, slide shows and table shows of fish. Anyone with a copy belonging to the Society, would they please return it. Contact: Mr. I. Newirth, 62 Plantation Street Accrington or Mr. P. Whelan, 31 Fountains Avenue, Little Harwood, Blackburn.

SCOTLAND



At the s.g.m. of the Dundee Aquarium Society the following officers were elected: President/Secretary, Mr. David Hill; Vice-

President, Mr. Frank Stewart; Treasurer, Mrs. Beryl Kydd; and Show Manager, Mr. Fred Conner. The Society meets the first Thursday of every month in the Y.W.C.A. rooms, 26 Crichon St., Dundee, at 7.30 pm. Anyone interested in our hobby can pay a visit where they will be made very welcome. They try to provide as wide a range as possible to interest the serious fishkeeper or someone who is only starting in the hobby. For further information contact Dave Hill, Leys Cottage, 57 Kirk Road, Newport-On-Tay (Tel: Dundee 541726).

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

OCTOBER

2nd October: EAST LONDON AQUARIST & PONDKEEPERS ASSOCIATION 34th Annual Breeders open show at Catterall Hall, Cecil Road, Chadwell Heath, Essex. Schedules available from Show Secretary, Mr. Martin Howells, 30 Kintons Road, Goodmayes, Essex. (Tel: 01-590 1824).

3rd October: THE BETHNAL GREEN AND INDEPENDENT A.S. 2nd open show to be held at Windsor Road School, Manor Way, East Ham, London, E.A. Batching from 9.30 p.m. on Saturday to 11.30 a.m. Sunday. Judging at 12.00 noon. Schedules and further information from Mr. L. Tuck, 9 Harford Street, Stepney, London, E.1. (Tel: 01-793 0965).

3rd October: NEWBURY & DISTRICT A.S. 10th open show. For details please contact the Chairman, B. A. Barrett, 38 Digby Road, Speen, Newbury, Berks. (Tel: Newbury 41393).

3rd October: DALKEITH COMMUNITY CENTRE A.S. open show at the Dalkeith Community Centre.

3rd October: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** are holding their monthly meeting at the Garboldisham Village Hall, where they will have a talk and slides on Koi-Keeping.

3rd October: BANBURY & DISTRICT A.S. open show at the Youth Centre, Hilson Road, Banbury, Oxon. Batching 11.00 hrs. Show Secretary: D. A. Williams, 2 Church Close, Gt. Bourton, Banbury, Oxon. S.A.S. to Show Secretary for schedules please.

10th October: EDINBURGH AQUARIUM AND PONDKEEPERS 10th annual open show at Craigroyton Community Centre, Pennywell Road, Edinburgh.

10th October: BETHNAL GREEN AND INDEPENDENT A.S. open show. Please note changed date.

10th October: SOUTH LEEDS A.S. open show at Hunslet Boys' Club, Hillside Road, Leeds 10. Show secretary, Mark Foster, 12 Malmsbury Close, LS12 4BW, for schedules.

10th October: HALIFAX A.S. open show at Forest Cottage Community Centre, Cousin Lane, Ilkleyworth, Halifax. Schedules on request with s.a.s. to David Shields, Cobblestones, Gaiwest, King Cross, Halifax HX2 1DT. For details ring Halifax 60116.

15th October: PRESTON & DISTRICT A.S. section at the Preston Students Union, Tyldes Road, Preston, 2 p.m. For further details telephone either Preston 22813 or Preston 35771.

17th October: The South and West section of the **SOUTHERN LIVEBEARERS AQUATIC GROUP** meeting at the Highfield Hotel, Clevedon, Nr. Bristol, at 2.30 p.m. There will be an auction of rare livebearers and a lecture by Mr. J. Dawes. Further details from D. Lashley, 20 Queen Mary Avenue, Morden, Surrey. (Tel: 01-540 0320).

17th October: BEXLEYHEATH & DISTRICT A.S. open show at Lasswell Heath Primary School, Bexleyheath, Kent. Further details from Show Secretary, J. Rowney, 259 Brampton Road, Bexleyheath, Kent. (Tel: 01-304 5756).

17th October: DONCASTER & DISTRICT A.S. 12th open show at Don Valley High School, Jossey Lane, Scavorth, Nr. Doncaster.

17th October: PERTH AQUARIUM SOCIETY open show in the Red Cross Hall, Newsum, Perth.

18th October: SOUTH EAST A.S. Bring and Buy Sale. 8 p.m. Hampton Football Club.

31st October: Third Convention of the **ASSOCIATION OF ESSEX AND EAST OF LONDON AQUATIC SOCIETIES** to be held at St. Augustine's Church Hall, Barbek Road, Rush Green, Romford, Essex at 2 p.m. A variety of speakers on Cichlids, Nanos, Fishes and Killifish. Tickets from David Newman, 1 Windmill Meadows, Ayrthorpe Riding, Dunmow, Essex.

NOVEMBER

7th November: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** are holding their monthly meeting at the home of Mr. D. M. Strange at 2.30 p.m. at 5 Parklands Green, Furrham, St. Genevieve, Bury St. Edmunds, Suffolk.

14th November: BRADFORD & DISTRICT A.S. open show at Clayton Village Hall, Clayton, Bradford. Further information available from the Show Secretary.

20th November: THE GOLDFISH SOCIETY OF GREAT BRITAIN general meeting, at the Conway Hall, Red Lion Square, Holborn, London, WC1 at 2.30 p.m. For further details re this meeting and future events contact L. B. Clapp, P.R.O. (Tel: 01-650 6954).

20th November: CATFISH ASSOCIATION GREAT BRITAIN 2nd and Convention at Arthurd Lower School, Windmill Lane, Edmonstone, London N18. Guest Speakers will be: Dr. Gordon Reid, Conservation Officer (Nat. Hist.); Merseyside County Council. Subject: Fish Collecting in the Niger, and Mr. E. Rogers (CAGR), Breeding Catfishes. Tickets from P.R.O., T. W. Glass, 10 Adelaide House, Portobello Court, Portobello Road, London W11 2DD. (Tel: 01-277 7481).