

AQUARIST & PONDKEEPER

DECEMBER 1997

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COVER

COVER PHOTOGRAPH The Angelfish is both popular and widely recognised, even throughout the non-fishkeeping world. Modern, aquarium-developed strains include Marbled, Gold, All-Black, Half-Black, Ghost, Blushing and Zebra ... to name but a few.

PHOTO: M-P & C. PIEDNOIR

COMMENT

So what happened to your fishkeeping ambitions during the past 12 months? Did you manage to acquire that 'hard to get' species? Did you walk off with the Best in Show Award with monotonous regularity? Perhaps you eventually got around to installing that pond/filtration equipment, or even (as a result of our November issue) took up the challenge of marines? Maybe you managed to get to the Society a bit more often or finished building that fish house. Even with limited tank space there would have been the opportunity for you to spawn some fish — even if it wasn't always a deliberate act on your part!

During the long, dark nights ahead the majority of our thoughts will be spent indulging in that favourite armchair pastime — planning for next year when we shall get around to doing all the things that we meant to do this year — if only we hadn't been so busy (or lazy!)

At A&P we've already been planning for 1998 and you will see one or two changes in these pages. Wall-to-wall articles may be all very well but we want to find room for you to have your say in more interactive ways — our Questions & Answers pages are one instance of this. We will also be introducing a little more humour whether it be in purple prose or cartoon form.

One of the successes of 1997 was the giveaway Booklet of 101 Marine Tips with the November issue — we've had many requests for extra copies — and we will be repeating the exercise early in 1998 with a tropical freshwater version. A useful addition to this edition is, of course, our Annual Index from which you can soon locate that article of specific interest amongst your past 12 issues of A&P.

On behalf of all the A&P production staff I wish you all the very best for the Festive Season and look forward to bringing your 12 great issues during the New Year.

John Potts

EDITOR

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Dr Peter Lewis describes his experiences with a dwarf cichlid from Lake Tanganyika

PHOTOGRAPHS BY THE AUTHOR

Breeding *Neolamprologus caudopunctatus*

During one of my frequent visits to check out the fish collections of fellow hobbyists I was attracted to a tank of a attractive, yellow finned, blue-eyed cichlids described as *Neolamprologus caudopunctatus*. On watching the tank for several minutes it became obvious that there were several fish in the tank that were approaching maturity judging by their reactions to each other. Closer inspection showed that the males could be identified easily since they were unique in having a thin red line bordering the outer edge of their caudal fin, some specimens showed this red across the entire extremity of this fin while others showed the red in only the upper part of the fin.

I did not need much persuasion to be convinced that I should add these beautiful cichlids to my own basement collection and that evening I arrived home with two healthy *N. caudopunctatus*. Next, I consulted my extensive library of cichlid books only to find that 'little is known about the breeding of these cichlids since captive breeding reports are not available'. Well, mine have spawned and I would like to share the experience through the pages of this publication with my fellow hobbyists.

SPECIES

Neolamprologus caudopunctatus (Poll, 1978), the specific name means 'spotted tail', deriving from the very

I did not need much persuasion to be convinced that I should add these beautiful cichlids to my own basement collection.

distinctive blue spangled spots that are present in the tail of both male and female. Synonyms — *Lamprologus caudopunctatus*.

DISTRIBUTION

Endemic to Lake Tanganyika, found in the southern area of the lake from Kapampa along the entire Zambian shoreline.

DESCRIPTION

A dwarf Lake Tanganyikan cichlid with a distinct, gold-yellow dorsal and blue eye, underscored with a vivid pastel blue line and a golden-cream coloured body. The caudal, anal and pectoral fins are speckled

Female outside flowerpot chosen as spawning site.



with small blue spots that become more intense as the fin nears the fish's body. A red-brown striped or banded pattern is also apparent toward the rear edge of both anal and caudal fins.

When annoyed or displaying to their fry both fish are capable of rapidly assuming a distinct striped pattern where the otherwise clear, cream-coloured body becomes crossed vertically with a series of wide, dark brown stripes. When at home in an aquarium *N. caudopunctatus* seems to forever be displaying all its fins in an erect and demonstrative manner such that its true beauty is always on exhibition. A colour morph is also found in the wild that lacks the brilliant yellow in the dorsal. In the wild the populations of *N. caudopunctatus* and *N. leloupi* overlap along the Lake's shoreline near the village of Kapampa, this is also the region where *N. caudopunctatus* is always characterised by its bright yellow dorsal.

SEXUAL DIMORPHISM

The most distinctive feature of a mature pair of *N. caudopunctatus* is their size difference in that a full-grown male will be 9cm standard length while his mate is likely to be much smaller at 6.25cm.

Additionally, the colours of the male may be just slightly more intense than those of the female but the best key is that mentioned at the beginning of the article concerning the red edge in the caudal fin shown by males. From a behavioural viewpoint the male is definitely the more aggressive of the pair.



NATURAL HABITAT

Coastal waters of Lake Tanganyika with a substrate of fine sand punctuated with rocky islands or outcrops. Found at depths from 1-25m. The Lake temperature remains stable year round at an average of 26.5°C with barely a variation of 2°C around this mean. Their natural food is small invertebrates and zooplankton. In captivity *caudopunctatus* will relish a feeding of Cyclops, Daphnia, Mosquito larvae or live Brine shrimp as a supplement to a diet of proprietary flake and freeze-dried foods.

WATER PREFERENCE

Clean, well-aerated aquarium water at a temperature of 25-28°C is ideal with a pH between 7.8 and 8.8. Hardness can vary from 500-600ppm TDS and can be achieved by the addition of epsom salts, magnesium sulphate, to the aquarium. Water changes amounting to 25 per cent of the aquarium every 10 to 14 days are appreciated, a change of water in excess of this quantity or at more frequent intervals is not likely to be appreciated and can cause undue stress on the fish, this is especially true if fry are present.

Male showing erect fin display, typical of this beautiful cichlid.



Female leaving flowerpot in which egg plaque has been placed.

SPAWNING METHOD AND DETAILS

An appropriate description of my breeding experiences with *N. caudopunctatus*, in the aquarium, is that of a monogamous maternal substratum spawning cichlid, in that the normal course of events involves the female caring for both the eggs and free-swimming fry while the male is banished to the point where he spends his time in hiding or defending their territory from fry from an earlier spawn or other inhabitants of the tank.

Owing to the size of this attractive Tanganyikan cichlid a 75 litre tank is perfectly adequate to house a single pair. Apart from some none too serious rearrangement of the gravel around the spawning site, *caudopunctatus* makes no attempt to excavate gravel from the substratum, consequently a planted tank is appropriate for the spawning pair since a strong growth of plants such as Java Fern, Java Moss and selected *Cryptocorynes* will provide security and shelter for both adults and fry. Essential to the spawning tank is the provision of rockwork, driftwood or similar furnishings arranged so as to provide several small caves in which the female may spawn.

The first indication that the fish are preparing to spawn is the beginning of the courting ritual practiced by the adults which involves fin-twitting, body-quivering and gentle fin-nipping; lip-locking, typical of many of the larger cichlids, does not appear part of this routine. A pair can be conditioned on the usual good quality flake foods in addition

Breeding *Neolamprologus caudopunctatus*

to several feedings of such small live foods as newly hatched Brine shrimp, sifted *Daphnia* and Cyclops.

As courtship proceeds the female will begin to remove gravel from the spawning site, often piling this gravel around the entrance to restrict the size and access to the cave. Spawning is a secretive affair and generally takes place on the roof of a cave or in the confines of an earthenware flowerpot. The signal that the spawning is over comes when the male is banished from the spawning site as the female assumes the role of hygiene provider, fanning the eggs, removing any that are fungused and keeping any unwanted snails away from the egg plaque. The hobbyist from whom I obtained the fish had his fish using an empty shell as both refuge and an egg depository. One of the photographs accompanying this article shows tiny, light green eggs visible at the mouth of the shell.

Hatching occurs after 72 hours at 26°C and the fry are free-swimming some four to six days later.

Often the first sign of the fact that the pair has spawned is the sight of several 5mm, six-day-old fry in the mouth of the chosen refuge. A typical batch of fry is probably no more than 45 young, although reports in the literature regarding observations of *N. caudopunctatus* in the wild suggest a spawn can be as large as 150. Their growth is slow, even when fed as varied a diet as newly-hatched Brine shrimp or sifted *Daphnia* as a supplement to microscopic fry food or pulverised, freeze-dried Krill.

Owing to the confined area in which the female deposits her eggs it is most likely that fertilisation is extremely efficient and since both parents guard

their territory against predation at all times the survival rate of the fry is high indeed, once they survive the apparently critical 14-day post-spawning period. Sexual maturity takes 12-15 months to achieve, at which point the mature males should have grown to 6cm, the females being almost 1.5cm smaller.

The first time my pair spawned the site chosen was a small, inverted earthenware flowerpot with the drain hole enlarged to such an extent that the female had easy access and egress to this artificial cave. Over the course of a week the female would be seen entering the flowerpot, only to emerge at once with a piece of gravel in her mouth which would be unceremoniously ejected outside the opening. The male did not try to enter the flowerpot at this time. A courtship dance ensued, consisting principally of fin-flaring and body-quivering, that lasted about two days after which time the male was allowed to enter the flowerpot. Although I did not witness the spawning I was hopeful that such an event had taken place since the male now spent his time lurking under a piece of driftwood, overgrown with Java Moss, away from the attention of the female. Some seven to eight days later very tiny fry were seen at the mouth of the flowerpot cave. They were small, no larger than 4mm total length.

As a result of the size of these newly-hatched fry I added one gallon of 'green water', from a rain barrel I

Young *N. caudopunctatus*, five months after becoming free swimming.



had outside of my home, to the breeding tank every day for the first seven days after the fry became free swimming. This I supplemented with sifted *Daphnia* and *Cyclops*, obtained from a local pond, and newly-hatched Brine Shrimp. Fish from this initial spawn were left to grow with their parents in the breeding tank.

Harmony existed for some five months by which time the young had grown to 2.5 cm and looked as attractive as their parents as they patrolled the tank with fins erect. However, it became apparent that the adults were about to spawn again since the female was doing minor excavation of gravel from a cave in the rocks and both parents were keeping the young to one quarter of the tank. I carefully removed the young, trying to cause minimum disruption to the tank and hoping I would not upset the spawning ritual.

Pair outside a rockwork cave, heavily overgrown with Java Moss, in which the second spawning took place.



Breeding *Neolamprologus caudopunctatus*

Within two weeks I was rewarded by the sight of the female leading a cloud of fry out of the cave one morning as I went to my fish room to feed my fish. During the time I spent observing the parental care I noticed on more than one occasion that the female would take flake food into her mouth, masticate the food and then spit the food into the cloud of fry, thus providing very finely divided food for her charges. Also, while photographing the fry at three weeks old I noticed that there were differences between the sexes, even at this age, in that careful examination revealed that some of the fry had jet black eyes while some had silver eyes. I can only assume that this was an example of sexual dimorphism with these cichlids since,

although it became less obvious as the fish grew larger, the eyes of the males are black whilst those of the females are more silver. As young this difference 'shines' out, once one knows what to look for.

KEY TO SUCCESSFUL SPAWNING

Water condition is not critical but should be in the middle of the range preferred by the fish. A suitable starting point would be water at 25°C with a pH of 7.8 and a dGH of more than 8.

An essential is provision of adequate caves and rockwork to provide a choice of spawning sites and security. A light growth of algae on the rocks appeared beneficial as the fry would browse on this growth on a regular basis.

It appears *N. caudopunctatus* will continue breeding until the tank is saturated with offspring, provided the territory is large enough to allow parents and young to coexist in harmony. In this respect *N. caudopunctatus* is similar to *N. brichardi*, another *Neolamprologine* from Lake Tanganyika.

Spawning can often be initiated by a water change coupled with an increase in temperature by two or three degrees above the aquarium norm.

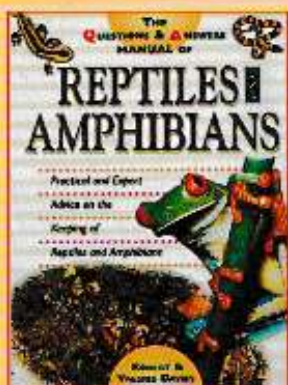
SPECIAL REQUIREMENTS

The water should be clean and well aerated using an appropriate air-operated sponge filter in the tank corner. While water changes are appreciated, they should not be too large, some 20 to 25 per cent being changed every 14 days is appropriate. Remember to match the chemistry of the fresh water to that of the breeding tank, especially with regard to the pH and hardness.

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BOOK REVIEWS



Q&A Manual of Reptiles

Authors: **Robert and Valerie Davies**

Publisher: **Salamander**
Price: **£14.99**
ISBN: **0 86101 943 1**

The range of Q&A Manuals from Salamander/Interpet continues to grow with this latest title. Like its predecessor, which dealt with marine aquariums, this manual also covers an equally visually attractive subject: Reptiles and Amphibians. The authors are well known contributors to A&P and have brought their collective expertise to bear in presenting a fascinating work.

Following a general introduction into the why you should (or shouldn't) keep herptiles, the book is divided into two (the first part slightly larger than the second) and covers Reptiles and Amphibians as separate entities. Each 'half' is further divided into two sections — Reptile/Amphibian Care and Reptile/Amphibian species with the 'Care' parts both defining the animals to be kept, Housing — the Vivarium, Heating, Lighting and Humidity, Furnishing the Vivarium, Foods and Feeding, Breeding, Health and Disease.

The Reptile species include Dragons, Agamids, Lizards, Slow Worms, Geckos, Iguanas (of several types), Boas, pythons, Harmless Snakes, Turtles and Tortoises. The Amphibians comprise True Toads, Fire-bellied and Clawed Toads, all manner of Frogs, Mantellas (farmer coloured Frogs than most), Newts and Salamanders.

With each entry, irrespective of what 'half' of the book it's in, tabular information is provided of Vivarium conditions required including such niceties as Winter Cooling, where necessary, and incubation periods.

But, of course the value of this work is the numerous 'questions and answers' segments included in each chapter which keeps you right up with current thinking and boosting your confidence as you go along; nothing appears to be left unanswered. This mass of practical information, based on a collective 70 years experience of working with herptiles, and coupled with stunning illustrations and clear drawings means that it is the ideal book for both inexperienced and 'expert' herptile keepers alike. This usually somewhat mysterious hobby has now had most of its secrets well and truly revealed.

DICK MILLS



Seahorses — Conservation and Care

Author: **Neil Garrick-Maidment**

Publisher: **TFH/Kingdom Books**
Price: **£7.95**
ISBN: **185279071-7**

Right on cue, as if to coincide with our Seahorse article this month, comes a new book devoted to their care in captivity and ultimate conservation. However, this book brings out another fact, not appreciated by most aquarists. Seahorses are not only found around coral reefs in warm, still waters, they are commonly found around more chillier coasts such as those surrounding Britain, Ireland and, of course, all round the Channel Islands.

The author, Neil Garrick-Maidment, has worked as an animal keeper for 23 years. Eight years ago Paignton Aquarium gave him a pair of baby Seahorses to breed on, and his absorption in these creatures began. Since then, he has achieved notable breeding successes. He set up the Seahorse Nature Aquarium in Exeter three years ago, as well as, in 1995, the International

Seahorse Conservation Group. In 1996, he launched the British Seahorse Survey. Next year he will be transferring his collection of aquatic equines to the new Marine Aquarium in Plymouth.

Neil's book accurately describes the Seahorse's natural history, including their most famous aspect — the male's ability to get pregnant and give birth to live young — and tackles the difficult subject of caring for the species in captivity with all the attendant

worries that regular (but suitable) feeding brings, bearing in mind an adult can eat 30/50 Mysis shrimps per day whilst young fry eat as much as 3,000 items!

Faced with the prospect of fulfilling this enormous need the average aquarist has to use newly hatched Brine Shrimp and these are previously enriched with algae before feeding to the Seahorse fry till is revealed in the book.

Fortunately, Seahorses do not appear to suffer from too many ailments (sadly, most die of other things whilst in captivity!) but there is guidance on how to alleviate what sufferings they do encounter. No less than nine species are described (and yes, some are known as Sea Ponies!) and the colour photographs are both appealing and informative at the same time.

Displaying a courageous stand, the book does contain the equivalent of a 'health warning' — to Seahorses, that is: in a large panel, readers are invoked NOT to consider keeping Seahorses unless they understand their needs and can care for them as they deserve to be kept. A stronger reason for buying this book cannot be envisaged.

DICK MILLS



DAVID TWIGG'S
KOI
CALENDAR

Christmas 'do's' are the main Club activities of this month but even they have their educational content. People of like mind do talk about their hobby even when enjoying the Christmas cheer.

The talk may be about nurturing their newly-acquired through this cold and dark winter spell.

Recently-harvested Koi do make excellent early Christmas presents for one's loved ones but, particularly if these fish are small in size, they and the conditions they are kept in do need to be carefully monitored. Well-filtered water producing stable quality is equally as important as stability of your selected water temperature.

I have just acquired a couple more vortex chambers so I can set up my own quarantine/treatment system. I have long envied those Koi keepers with a facility of this sort that enables them to buy Koi at the opportune moment without the worry of the dangers that can exist by introduction of new fish to the main pool without quarantine.

The main pond at this time of year is probably covered to minimise heat loss and, consequently, our Koi are out of sight. If this is the case please consider arranging a way that the Koi can be viewed with minimum disturbance

during this time because out of sight should definitely not mean out of mind. The chap who covered up his pond and went off to Spain for three months springs to mind! He was most shocked to find most of his prize possessions dead on his arrival home. Even if the water temperature is low and food is not being given our Koi will still find natural food to eat in the pond when they need it and they continue to excrete ammonia during this time. A watchful eye should, therefore, be kept on health and water quality to prevent either taking a turn for the worse.

But enough of the dangers, it's Christmas and Lyn and I would like to thank all those friendly, fellow Koi keepers we have met around the country during the past 12 months for their hospitality, and would personally like to say thanks to all the Koi Clubs who provide me with the data for this column. I hope your membership numbers swell and you all have a very happy Christmas. Finally, I would like to thank Karen Tolman for sending in a report and results of the Mid-Somerset Section Show which will revive memories of their own Show times for Koi keepers everywhere.

The 1997 Mid Somerset BKKS Closed Show at the Countryside Cavalcade

Karen Toleman reports
Photographs by Frank Hibbert

The 1997 Mid Somerset Closed Show loomed closer; this year was to be something of an experiment. The Show was still to be held in conjunction with the Countryside Cavalcade, at the Royal Bath & West Showground, involving a Steam Fair, Heavy Horses, Fur and Feather, Crafts, Antiques and much more. In previous years we had been sited on a balcony in a large building overlooking the Craft Fair. This year we were to occupy the newly refurbished Mendip Hall, a ground floor location.

When we arrived on the Saturday morning the sun was shining and the weather set fair for the weekend. The advantages of the new venue soon became apparent as we could drive into the Hall and unload the fish straight into the vat. Everyone felt that setting up had been easier, especially the trade stands and those responsible for getting the water into the vats. The water quality proved to be better than it had ever been on the balcony. The Vats had been filled on Friday afternoon and left to stand (without aeration) until benching commenced under the auspices of Ian Prior, our bencher for the day and a B.K.K.S. trainee judge. The new skylights provided good natural light in which to view the Koi.

The Show Vats and Information Table took a fairly central position to one side of the Hall and the Show was well supported by dealers of Koi and Koi related goods. The Koi dealers were Bath's Water Garden and Koi Centre (Pondlife), Aquastore from Bristol and Koi Southwest. I was pleased to see Club members Stuart and Melanie who started selling select high-grade Koi from well known Japanese breeders (by appointment) this year under the name of Harasumi Koi, also dry goods at competitive prices. Other stallholders included Wessex Bonsai Society, who were promoting their organisation, giving regular demonstrations in

pruning, wiring, etc., and selling off end-of-season stock. Collect-a-Card sold cigarette and other card collections, some framed, covering many interests and including Koi portraits by Keith Siddle. Mr Erotokristos of Collect-a-Card kindly donated a framed Nishikigoi Premier Collection by Keith, which is to be auctioned at the AGM. Further details are to be found in our October section magazine, *Splash*. Teeszer carried a huge selection of beautifully designed Koi tee-shirts and sweatshirts, while The Nishikigoi Collection at Country Homes of Beckington had a fine display of decorative and useful gifts for the home including Koi plaques, sculptures and clocks.

The Information Table held the usual collections of magazines and information, with videos running throughout the day, and was manned by members giving information and advice when required. A good selection of donated prizes ensured interest in the Raffle. Prizes included the books *Nishikigoi Still Waters*, *Koi Kichi* (both donated by the authors) and subscriptions to *Nishikigoi International Magazine* as well as Koi foods, Japanese ornaments and lanterns and many other prizes.

Philip and Beryl Rolfe had used one corner of the Hall and constructed a lovely garden, complete with plants, pond and fish. From there they ran a Fish Tombola and an extremely popular children's competition based on a questionnaire concerning pond life, nature and Koi. The prize vouchers donated by Watermarque were very well received and in the absence of a PA system on the first day, Yeovil Town Crier, Bruce Trigger, did a marvellous job in presenting these prizes and calling the Raffle for us.

In all 103 fish were entered under three sizes (up to 9in, 9in to 16in and over 16in) and were judged by senior judge Nigel Williams and trainee judge Wayne Eady. Together with Ian

Prior they stayed on all day talking to Section members and members of the public, answering any questions they were asked, finally leaving around 7pm. A special thanks must go to them for their dedication and time spent in travelling and judging for the promotion of the hobby and the B.K.K.S.

The title of Grand Champion was awarded to a lovely Kohaku owned by Eddie Aston. Eddie has worked very hard for the

Club and it was good to see the title go to such a deserving winner. Our thanks to Eddie and to the rest of the water quality team who worked so hard throughout the Show, particularly Chris Tyrk who worked both days and stayed overnight. Also to Peter McDowell for night duty and to Derek Elliott who worked tirelessly to keep the Vats in pristine condition. As a result of their efforts the fish remained in good order, with very few

showing any sign of stress throughout the Show, and there were no casualties.

Through our affiliation with the F.B.A.S. each exhibitor had the opportunity of a free jar of Laguna colour feed donated by Hagen and Interpet donated a keep-sake trophy, sweatshirt and tee-shirt for the owner of the Grand Champion.

Finally, thanks must go to Colin and Stephanie for their dedication, the organisation and paperwork being a phenomenal

task, and to all those whose hard work makes the Show possible.

There is already talk of next year's Show being bigger and even better! To those who have never been to the Countryside Cavalcade make a note in your diary now: September 12 and 13 1998.

There is so much to see and do, even for those poor souls who have not yet been converted to the joys of Koi appreciation!

See you next year!



Some of the trade stands early on Saturday morning.



Grand Champion owner Eddie Aston being awarded the FBAS/Interpet Trophy from Section Secretary Stephanie Blunden with Chairman Colin Baker (right).

RESULTS

Supreme Champion Kohaku, Eddie Aston. Reserve Champion Utsumono, Peter McDowell. Best Size One Sanka, John Butler. Best Size Two Sanka, Philip Rolfe. Best Size Three Kohaku, Peter McDowell. Ladies' Trophy Gin Rin, Julie Woods. Unique Koi Hikari Muji, Mike Newman. Best Doitsu Shusui, Peter McDowell. Size One Kohaku, 1st Chris Tyrk, 2nd Colin Baker. Sanka, 1st John Butler, 2nd Eddie Aston. Shows, 1st Eddie Aston, 2nd Mike Woods. Utsumono, 1st Eddie Aston, 2nd John Butler. Koromo, 1st John Butler, 2nd Stephanie Blunden. Hikari Muji, 1st Simon Elliott, 2nd John Butler, Hikari Moyo, 1st Philip Rolfe. Kawarimono, 1st Eddie Aston, 2nd John Butler. Tanchu, 1st David Thatcher. Gin Rin, 1st Mike Newman, 2nd John Butler. Size Two Kohaku, 1st John Butler, 2nd David Thatcher. Sanka, 1st Philip Rolfe, 2nd John Butler. Shows, 1st Karen Toleman, 2nd Mike Woods. Utsumono, 1st Karen Toleman, 2nd David Thatcher. Bekko, 1st Colin Baker, 2nd Mike Woods. Asagi/Shusui, 1st Karen Toleman. Hikari Utsuri, 1st Simon Elliott, 2nd Chris Tyrk. Hikari Muji, 1st Eddie Aston, 2nd Eddie Aston. Hikari Moyo, 1st Philip Rolfe, 2nd Simon Elliott. Kawarimono, 1st Julie Woods, 2nd Mike Newman. Gin Rin, 1st Julie Woods, 2nd Chris Tyrk. Size Three Kohaku, 1st Peter McDowell. Sanka, 1st Peter McDowell. Shows, 1st Peter McDowell, 2nd John Butler. Utsumono, 1st Peter McDowell. Bekko, 1st Peter McDowell, 2nd David Thatcher. Asagi/Shusui, 1st Peter McDowell. Koromo, 1st Peter McDowell. Hikari Utsuri, 1st Mike Newman. Hikari Muji, 1st Mike Newman, 2nd Peter McDowell. Hikari Moyo, 1st Peter McDowell, 2nd Philip Rolfe. Kawarimono, 1st Peter McDowell, 2nd Peter McDowell. Tanchu, 1st Mike Woods, 2nd Peter McDowell.

KOI MEETINGS IN DECEMBER

- 3 Leicestershire Section BKKS.** Christmas Party at Kirby Muxoe Sports Club. Contact Ray Dunkley, 0116 2771600.
- 6 Leicestershire Section BKKS.** Christmas Sotties Night. Contact Ray Dunkley, 0116 2771600.
- 10 Nottingham & District Section BKKS.** Contact Shirley Hind, 0115 981 0923.
- 14 Heart of England Koi Society.** Christmas Dinner at Whitefields Hotel, Dunchurch. Contact me on 01926 495213.
- 28 Northern Koi Club.** Christmas Coach trip to Infiltration. Contact Tony McCann on 0161 794 1958.

All Koi keepers are welcomed to the events mentioned in this Calendar (an entry fee may be payable) and further details can be obtained from the contact telephone number quoted alongside the diary entry. My thanks go to all Koi Club Secretaries or PRO's and others who send me their latest calendar for inclusion in this column. If your club is not mentioned and you would like it to be, please write to me via the Editor at MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent, TN24 6ET. Although I do my best to ensure all events are mentioned it may be that some information, which arrives a little late, misses my deadline. To minimise the chance of this occurring you may find it more convenient to fax me direct on 01926 403500. This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

Caught in the Net

Kathy Jinkings finds the Net is full of general aquatic interest

New technologies arrive at a surprising rate, often with a somewhat inauspicious start. Items once regarded as strange and useless novelties, such as the fax machine and personal computer, are now such a part of our daily lives that it is difficult to remember how we survived without them. Even if we don't use them ourselves, they still impact the way information reaches us and the way businesses are run. Nowhere is the rate of change and development faster than on the Net, as will be appreciated by anyone who has spent an hour downloading the latest browser only to find it is out of date a couple of months later. This month we will be taking a look at some of the newer technologies available on the Net.

At the moment the applications are simply of amusement to us, but spare a thought as you surf through this month's offerings for the way these ideas will be changing our lives as modem speeds become ever faster and computers improve faster than our wallets can keep up with.

Viewcams are cameras linked to the Internet which regularly take a new picture at intervals.

Most browsers (and viewcam pages) will automatically update the screen, but those produced by people with a little less technological know-how (or viewed by people with older browsers) often require you to reload the page to see a new picture.

The first site on this month's tour is the Amazing Fish Cam, at <http://www.netscape.com/fishcam/fishcam.html>. Part of the Netscape site, this shows a fish tank (either large pictures or small ones) from a couple of different angles. Netscape should be able to do better than having a Javascript error, which this page features, but this is still an ideal starting point for anyone who wants to understand viewcams. The continuously refreshing page at http://fishcam.netscape.com/fishcam/fish_refresh.html features a rapid animation (in close-up this time) of the last hour's activity in the fish tank, and for the technically minded there is a page here explaining how the screen is refreshed for anyone wanting to implement a similar function on their own web site. 'About the FishCam' isn't just for techies though — through this link you not only learn about the cameras, but can read

information about the fish featured and the filtration system. There is also a large photo supposedly of the filtration system. Since this is mostly black, and one must assume the author has never actually looked at it, we'll have to take his word for it. There are also some fishy links and more technical information, including a page on dynamic HTML (don't bother unless you've got Netscape or Explorer 4, as it won't be working).

The 3D live site at http://chaos.ais.co.kr/_1_ais_home/Fishes/2d_index.html combines the viewcam technology with an old favourite, 3D viewing. You choose which version you would like, from a choice of 2D, old-fashioned 3D (strange spectacles required) or a new 3D which can be viewed with the naked eye, provided you sit back about a metre from your monitor. The somewhat confusing instructions ask which fish you get, rather than indicating you are supposed to choose one.

Once you are viewing your chosen viewcam, you will have to hit reload to update the picture of the Goldfish. If you are impressed with the 3D pictures, the web site has a gallery of other 3D images.

Keiko is the Killer Whale who achieved stardom in 'Free Willy', and whose fans were infuriated on discovering he lived in inadequate conditions and was suffering from chronic health problems. He now features in the viewcam at <http://www.discovery.com/area/keiko/whale1.4.html>, showing him in his new home in a two million gallon tank in Oregon. This is nearly as good as going to the zoo — whenever you look Keiko is usually somewhere else. For those who never get to see him, the 'Best of the Cam' page features some shots from when Keiko was actually in view. The information provided in the FAQ is extremely comprehensive, and features just about every Killer Whale question you can imagine, both about orcas in general and Keiko in particular. If you want to find out more about Keiko, visit the Free Willy Keiko foundation at <http://www.keiko.org/home/index.html> for lots of information.

Whales are also featured in another use of a new technology — virtual reality and 3D modelling — at The Virtual Whale Project, at <http://fas.sfu.ca/es/research/Whales/>.

Simon Fraser University researchers use a variety of tools such as sonar and tags attached to whales to study their natural behaviour deep in the oceans, but this data is not easy to visualise as actual whale behaviour. They are using virtual reality whales — computer generated movies of 3D whales, which follow the patterns illustrated by the sonar and other tools. This helps them visualise the whales, and makes the project more interesting for school children, as part of their mission is to educate children about these beautiful creatures. The page features several downloads, including movies of both the virtual whale — almost indistinguishable from the real thing — and real whales. The contrast shows how the virtual method makes it possible to observe these creatures with far more clarity, and technology like this could be used to improve our understanding of many more aquatic animals. The VRML model used for the whale is accessible as a VRML page, so you can wander round him and examine the surprisingly simple model up close. The whale sounds for download are very beautiful, and you can continue browsing while the sounds download in a separate window.

The Monterey Bay Virtual Aquarium, at <http://www.live-eyes.com/eye-site/vrml/vrmba1/vrmba1.url>, is a fascinating VRML (Virtual Reality) site, where by use of your cursor you can walk about rooms in the aquarium. While there are no 'live' moving fish that I found, you can look at posters and displays on the walls, and pass strange shadowy people also examining the exhibits. VRML worlds load in blocks, so if you have a chink in the middle of the screen and can't move, it isn't that it's not working — it just hasn't finished loading.

In order to visit virtual worlds you need a plugin for your web browser. I used WorldView 2.0 for Netscape, which you can download free from <http://www.intervista.com/>.

Aqualand, at <http://vrml.fornax.hu/aquar/>, is another VRML site, which even has accompanying music. This features a 'tutorial' about fish. You click your 3D guide, who shows you around Aqualand, riding ahead of you on a type of sled to see tanks of different fish swimming. In the right of the screen appears very

comprehensive information about the fish you are looking at. Although this site doesn't let you choose the direction you are going, or wander about without your guide, this is one of the best VRML sites on the web — informative and entertaining as well as showcasing the technology. The tour includes four different species of fish, and if you finish the tour you can take a test to see how much you have learned! The site implies that if you visit another time then a different 'course' might be running, but the sheer volume of work that must have been involved probably precludes the course changing very often.

Video files on the Net have always been massive and to see them you needed to download the entire video before starting to view it. The RealPlayer, available free at www.real.com, allows the video to start playing well before the download has completed, not only nearly eliminating the time you have to wait, but also enabling you to cut the whole thing short if you decide you aren't that interested after all. Nature TV, at <http://www.nature-tv.com/index.html>, offers a selection of nature-oriented videos to watch. When I viewed films about coral reefs, Sharks, Coyotes and 'Amazonia, voices of the rainforest' were available for viewing. The video is still a little jerky, but this is a major improvement on some of the old formats, including not only the video, but an accompanying soundtrack. The quality is better if you have a fast connection, so try this one when the Net is quiet.

The Real site offers listings of many other video and sound sites that you can visit.

Next month we will be taking a look at some of the smaller, personal sites on the web, where you can find out what other fishkeepers are doing, their tank set-ups, and experiences.

Kathy can be contacted at kathy@ckfc.demon.co.uk and the British Aquatic Resource Centre can be found at <http://www.ckfc.demon.co.uk>

Dave Garratt says it's a tough life being a male Seahorse

PHOTOGRAPHS BY LINDA LEWIS

The Case of the Pregnant Males



A pair of
Prickly
Seahorses,
*Hippocampus
histrix*.

MARINE

The family (Syngnathidae) connection between the Seahorse and the Greater Pipefish, *Syngnathus acus*, can be seen by looking at the narrow, tube-shaped mouth.

Hippocampus species from the Philippines.

Very few marine fish reach the heights of appeal generated by the Seahorse. Their almost prehistoric appearance,

The Case of the Pregnant Males

The attraction of the Seahorse is not just limited to the aquarist; they capture the imagination of the public to such an extent they have starred in a prime-time TV programme.



graceful nature and unique reproduction, make them irresistible to many hobbyists. Their attraction is not limited to the aquarist, they capture the imagination of the public to such an extent that the Seahorse has starred in a prime time television programme.

Unfortunately this appeal has led to them becoming one of the most long suffering fish in the marine hobby. I dread to think how many have wasted away to a premature death at the hands of the aquarist. Seahorses can be successfully kept in the home aquarium, they have even been bred and reared, but they have certain essential requirements and are therefore definitely not for the beginner.

ABSOLUTE ESSENTIALS

Seahorses have two essential requirements that must be catered for in the home aquarium. To ignore either of these requirements will result in heavy casualties. If the hobbyist cannot provide these requirements Seahorses should not be considered as an option. The crucial requirements are:

1. A constant supply of small live food.
2. A quiet aquarium without any boisterous competition.

LIVE FOOD

Seahorses have small mouths and thrive on live food. It follows that the hobbyist must be able to supply large quantities of suitable live food such as Brine Shrimp, River Shrimp and Rotifers.

Success is best achieved in a mature invertebrate tank. These tanks will have acquired a population of small crustaceans on which the Seahorse can feed, although supplementary additions of live Brine Shrimp would still be required. Do not underestimate the cost of providing sufficient live Brine Shrimp. The cost, however, can be reduced if the hobbyist has



the time and inclination to raise their own Shrimp from eggs. Some aquarists have successfully managed to wean their charges onto frozen Brine Shrimp and frozen Mysis.

A QUIET LIFE

Seahorses are poor swimmers and spend much of their time anchored by their prehensile tail to some suitable holdfast, for example a coral branch. It is essential that the hobbyist furnishes the tank so as to provide many such anchorage points. They have lost their caudal fins and propel themselves slowly through the water, in an upright position, by beating their dorsal fin. Because of the slow mode of swimming and their peaceful disposition they are not equipped to compete with other fish for food, consequently they will only thrive in their own tank. The only exception to a species tank is to stock with tankmates of a very similar disposition such as Pipefish (Syngnathidae Family) or Shrimpfish/Razorfish (Centriscidae Family).

THE SEAHORSE FAMILY

The Seahorses, along with the Pipefishes, belong to the Syngnathidae Family. The Family comprises over 60 species with a distribution covering the Indo-Pacific, Western Atlantic and the Caribbean. A characteristic of the Family is that all its members have their bodies encased in bony rings.

The commonest species in the hobby include:

Hippocampus kuda or Yellow Seahorse, a large species that may attain 10in in the wild. *H. histrix* is a smaller species at 6in, and because of its spiky body projections it is commonly known as the Thorny Seahorse.

H. hudsonius, the Florida Seahorse, is a similar size to *H. histrix*.

H. zosterae is a Dwarf Seahorse only reaching 2.5in in length.

H. fuscus, a 5in specimen, is also known as the Sea Pony and features again later in this article as testimony to the success of a dedicated hobbyist.

A BIZARRE SEX LIFE

Seahorses enjoyed a further boost in popularity following a TV programme revealing the Seahorse's highly unusual sex life to its viewers.

The Case of the Pregnant Males

Female Seahorses have achieved the ultimate position of sexual equality, the male becomes the mother!

A pair, often forming a permanent bond, will engage in elaborate courtship dances followed by fertilisation. Immediately after fertilisation the eggs are deposited into a ventral pouch on the male. The female then relinquishes all responsibility and leaves the male to get on with it. The male takes over the role of female in incubating and nurturing the brood. According to the species, after 20-50 days incubation, the eggs are hatched and the male gives birth as the young emerge from its pouch.

THE PIPEFISH — CLOSE COUSINS OF THE SEAHORSES

Pipefish, despite their appearance, are related to the Seahorses in so far as they also belong to the Syngnathidae Family. Like the Seahorses the males carry the eggs. They are also similar in their essential aquarium requirements, i.e. they require small sized live food and a quiet tank free of competition. They are well suited to an established invertebrate tank and are one of the few species that could be considered as tankmates for Seahorses.

Pipefish are not regularly seen for sale in the average retail shop. When they are seen the most common species is the Banded or Harlequin Pipefish, *Dunkereocampus dactylophorus*, a species from the Caribbean. The fish have a large snout and a very slender body, reaching up to 7in and terminating in a disproportionately large caudal fin. The body of the fish is covered with alternating off-white and deep maroon bands. There are similar species found in the Indo-Pacific region.

BREEDING SEAHORSES — A SUCCESS STORY

A number of Sealife Centres around Britain have been successful in breeding and raising Seahorses. However, I thought it more pertinent to detail the success of a hobbyist. I am greatly indebted to Clive Wingrave of Brighton for the information that forms the text for this entire section of the article.

He succeeded in raising to maturity

41 out of a total of 65 young Sea Ponies (*H. fuscus*). He sold many of the offspring but kept six for breeding purposes and they attained a size of 3.5in.

They reached sexual maturity and rewarded him with second generation offspring. Regular success with raising Sea Ponies followed. He also had a little success with *H. histrix* but, unfortunately, the casualty rate was very high and only a few developed to maturity. The basic points of his system are given below.

BREEDING *H. FUSCUS*, THE SEA PONY

Main Tank: 46x24x22in trickle filtered by home made system. Furnished with Tufa rock.

Rearing Tank: The newborn are transferred to a three gallon tank for the first two weeks. The tank requires regular water changes. They are transferred to a 10 gallon under-gravel tank for weeks two to five. This tank requires weekly water changes to combat the heavy feeding schedule and regular gently stirring of the filter bed to prevent compacting, again caused by the heavy feeding. The young are then transferred back to the main tank at week five.

Livestock: Polyp rock, soft corals, Caulerpa. No other fish and no anemones.

Feeding the Adults: Live River Shrimp, live Brine Shrimp. Gradual coaxing onto frozen mysis and frozen Brine Shrimp.

Feeding the Young: First 20 days newly hatched Brine Shrimp and Rotifers. From week three a mixture of frozen red plankton and adult Brine Shrimp is used. By snapping at the mixture some of the offspring appeared to actually take the plankton.

Calcium Supplement: Many casualties among young Seahorses are thought to be due to a calcium deficiency affecting skeletal formation. Clive dramatically reduced his fatalities by the addition of Tropic Marin Bio-calcium to the water of the rearing tanks.

Cost: A word of warning. Clive was spending £22 a week on live River and Brine Shrimps to feed his adult and maturing Seahorses. Added to this is the cost and time of producing your own newly hatched shrimps from Brine Shrimp eggs and culturing the Rotifers.

I would like to conclude by once again thanking Clive for the information on his great success with Seahorses.



FROGS & Friends

By BOB and VAL DAVIES



CHEAP AND CHEERFUL — LEOPARD GECKOS

Numerous keepers 'cut their teeth' on Leopard Geckos (*Eublepharis macularius*) being one of the easiest lizards to keep. Often



Leopard Geckos. Still a firm favourite — they are tame and have relatively simple requirements.
PHOTO: BOB & VAL DAVIES

CAPTIVE CARE

Vivarium Size: 24x12x12in (60x30x30cm) for a pair.

Substrate: 1-2in (2.5-5cm) dust-free sand.

Habitat: Dry. Cork bark for hides. Small water bowl. Rocks. Good ventilation needed.

Day Temperature: 76°F (25.5°C) at the cool end (away from the hot spot which can be an ordinary domestic lightbulb).

Night Temperature: 70°F (21°C). Photoperiod: 14 hours.

Food: Dusted insects. May also take a 'Gecko Grib', a specially formulated convenience food from reptile outlets.

recommended as 'ideal for beginners' their needs are modest, no specialised equipment beyond a good thermostat are needed. Being nocturnal they do not need full spectrum lighting which of course reduces the initial cost of setting up. As they are crepuscular/nocturnal in habit Leopards do not have the same need for the UV part of the spectrum but it is advisable to dust their food with a

as small bits of cuttlefish bone which they will eat.

A non-dusty sand such as birdseed or one of the newly available reptile sands obtainable from specialist outlets is a suitable substrate. This provides a more natural set-up. Leopard Geckos tend to defecate in the same place so spot cleaning can be carried out every day with a complete change of sand once a month or so. If rocks are used to add interest ensure that they are firmly placed on the vivarium floor and cannot be moved by digging. Living plants are not desirable as they will increase the humidity. Leopard Geckos do not need a full vivarium. They are terrestrial lizards and do not possess adhesive toes.

Hatchlings are particularly attractive being white/yellowish with mauve/brown markings. These tend to fade as they grow. Adults (which can grow to 8-10in/20-25cm) are basically fawn with dark brown markings although in recent years there has been an increase in breeding to obtain more yellow colouration. Leopard Geckos are widely available as captive-bred but occasionally a few wild caught specimens appear in the shops.

good multivitamin/calcium supplement. Inland, basking lizards use UVB to synthesise vitamin D3 in their body, the vitamin in turn aids the metabolism of calcium. Full spectrum can be used if desired. Leopards often come out in the daytime so any UVB would be beneficial. Calcium can also be supplied

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MAKE YOUR VIEWS KNOWN

The Tortoise Trust Newsletter (Summer 1997) contained pictures of Egyptian Tortoises (*Testudo kleinmanni*) on sale in a Cairo market despite the fact that it is an endangered and theoretically protected species. The unfortunate creatures are stacked in containers often five

or more deep and stood in hot sunlight, unable to move and kept without food or water. Many of them naturally succumb to this treatment. Trading in this species and various other birds, reptiles and mammals is apparently allowed to go on practically unhindered although illegal. Occasional raids and confiscation take place but with little effect.

The Cairo American College,

with assistance from the Tortoise Trust, have organised a rescue centre for some of these unfortunate creatures but stronger action at source is needed.

The Trust has asked people to express their disgust at this dreadful trade by writing to: His Excellency the Ambassador of Egypt, Embassy of the Arab Republic of Egypt, 26 South Street, London W1Y 6DD.

CHRISTMAS PRESENTS

Since it's that time of the year many readers will have their minds on buying presents. We have previously warned about buying live creatures as presents unless suitable housing has been arranged and the recipient has acquired sufficient knowledge to care for the animal but would like to add a further caveat concerning nutrition. Feeding reptiles is not simply a matter of throwing in a few crickets for lizards, a mouse for snakes and a lettuce for tortoises. Popularity of tortoises seems to have increased over the last year — these and other herbivorous reptiles have complex dietary needs to prevent metabolic bone diseases and deficiencies. Feeding any reptile is too complex to be left to children — it should be supervised by adults until the child is competent.

Suitable presents for would-be keepers include the more expensive items such as thermostats. Numerous models are available and need some consideration as to their suitability for a particular purpose. Simple on/off thermostats are suitable for heater mats, power plates or heat strips. Other models are recommended for use with ceramic heaters and for use with light bulbs; a dimmer type is best. Not all thermostats can be used with light bulbs. Dimmers gradually reduce the light as the desired temperature is reached and increase it when necessary. On/off thermostats create alternate periods of light and dark which is unnatural. Greater sophistication can be purchased — at higher prices, obviously!



Correct temperature is vital. Modern thermostats are generally accurate to fairly precise limits. PHOTO: BOB & VAL DAVES

Certain makes are available with a stated percentage of UVB, higher percentages are for desert species. The UVA part of the spectrum has other beneficial aspects. NB: The effective distance of full spectrum (UVB) tubes has often been questioned. Most types need to be 5-6in (12.5-15cm) away from the subject but at least one type now claims to be effective at 12in (30cm) and to retain efficient UVB production for 12-18 months, others may have to be replaced at six months. If possible try to obtain a spectrum analysis showing UVB/UVA content from the manufacturer or dealer and discuss with the dealer the most suitable type for your needs.

Another possible present is a digital thermometer with external probe. These vary from simply giving the vivarium temperature, or temperature and humidity up to models which show inside and outside temperature plus, if required, a maximum and minimum reading.

Models are now available with twin channel facilities — useful in a large vivarium for maintaining two different temperature zones or controlling separate vivaria. Other refinements include day/night settings enabling a night time drop which is important for many reptiles and alarms to warn of low temperature, high temperature or heater failure.

Full spectrum fluorescent are denser than normal tubes. Recommended for diurnal reptiles the UVB (the essential element) content varies with the brand, some contain very little. Certain tubes labelled 'full spectrum' or 'suitable for reptiles' may produce no UVB.

FURNISHING VIVARIA

Many keepers dislike a sterile, basic set up and try to decorate the vivarium in a more 'naturalistic' style. Where a number of vivaria are kept easily cleaned layouts are often a necessity due to the time involved. Furnishing the vivarium is not new; years ago many keepers housed amphibians in set ups resembling the old Victorian ferncases and some enthusiasts have always used decorative materials to create designs which they fondly imagine resembles the occupants' native habitat.

Producing such a set-up is easier for amphibians and the relatively few reptiles which can tolerate some humidity. In these cases the layout can include living plants. Since plants increase the humidity adequate ventilation is important — damp conditions for most reptiles cause respiratory and skin diseases. Other factors to consider are the size of



Vivarium decor — a few natural items can provide an attractive 'picture' in a dry vivarium. PHOTO: BOB & VAL DAVES

the inhabitants — they may simply bulldoze your elaborate layout or they may be burrowers/diggers and produce similar devastation which is frustrating after hours of artistic layout.

The aesthetic appeal of a dry vivarium can be increased by judicious use of a few natural materials. Waterwort, rocks, clumps of dried moss, gnarled logs, pine cones, bits of bark, dried leaves and flowers can for little effort produce a pleasing scene. The main thing to remember is the importance of hygiene — the vivarium is bound to become fouled and unsightly. Spot cleaning delays complete

refurbishment but sooner or later some or all of the materials will have to be replaced or cleaned. Thoroughly cleaning some natural items can be difficult, replacing them may be easier. Note also that certain materials will rot or develop mould where there is permanent moisture. Setting up a 'habnosed' vivarium for amphibians will be dealt with in a later issue.

IMPORT BAN?

Having mentioned on several occasions the dumping of Red eared Turtles and American Bullfrog tadpoles which then become a threat to native wildlife it was interesting to hear that the EC Cities Commission was meeting in October to discuss

the possibility of an EC import ban on these two species. EC Regulations allow such restrictions on species which if released present an ecological threat to indigenous wild species. At the time of writing the decision is not available. A potential problem is that if Red eareds are banned certain other species such as Painted Turtles

could take their place. The Bullfrog tadpoles may have been escapees as some dealers were selling them as 'suitable for garden ponds' which is ridiculous — they are bound to wander off when they metamorphose and can easily survive in our climate and possibly breed here. Red eareds can survive but their breeding is unlikely as our

summers tend to be too cool for incubating the eggs but in view of the heatwaves of recent years one never knows!

We would like to take this opportunity to wish everyone a Merry Christmas and a Happy New Year.

Trevor Baker takes a personal plunge into Nature's own aquarium

PHOTOGRAPHS BY THE AUTHOR

Looking into the Global Aquarium

Anthias shoal — rich pickings in the water column supported vast numbers of Anthias and other plankton-picking species.



A large marine aquarium of the sort that is usually only seen on public display is always a striking sight even without the reef invertebrates as a backdrop. The fish alone provide a stunning view with their huge variations in colour, shape and behaviour. If you find that sort of scene mesmerising imagine how I felt diving in the crystal clear tropical

Imagine how I felt diving in the crystal clear tropical waters of the Similan Island Marine National Park off the western coast of Thailand.

waters of the Similan Island Marine National Park in the Andaman Sea off the western coast of Thailand.

The dive experience was on a live aboard catamaran, an ideal venue to sleep, drink and eat diving non-stop for five days. In between each dive, of which there were four everyday, the catamaran cruised to new sites amongst the nine islands with Sea Eagles and Brahminy Kites patrolling overhead.

The First Dive

Always sheltered against prevailing weather and spoilt for choice between numerous reef types, sheltered bays or steep drop offs, I encountered and observed all manner of fish including some awesomely-sized pelagics alongside more familiar species. The Indo-Pacific fauna is fantastically diverse and this was vividly demonstrated on the very first dive.

Stepping off the rear platform into the strait between Kah Banju and Kah

Similan (Islands 8 and 9) I immediately looked below the surface and was stunned by the multitudes going about their business beneath me. An adult giant Triggerfish caught my attention for the intrusion of divers had clearly caught his. It swam up from 15m to only a couple of metres shy of me then swam around, maintaining its distance and definitely keeping square on to indicate how big and healthy he was as a warning that I was entering its domain. Shoals of equally curious Rabbitfish parted as it swam up to me and my attention was only diverted by the wall

of stunningly blue and yellow Fusiliers (*Caesio xanthonota*) that streamed by and in front the giant Triggerfish.

I descended with the rest of the dive team toward the bottom, clearly visible 18m below, where the Oriental Sweetlips remained motionless in their group, inches above the enormous Brain Coral head. Being so self possessed they made excellent photographic subjects — easy to approach, strikingly coloured and a good size. Well worth a place in a large (very large) aquarium.

Anthias have always fascinated me, so I was delighted to watch a shoal go



Bluefin Tuna passing swiftly behind a shoal of stunning Fusiliers, *Caesio xanthonota*.



Cephalopholis miniatus, the Coral Trout. Such a colourful fish and sure to catch the eye either during a dive or in a large aquarium.

about its business. In addition to the continuous task of foraging for food in the water column, picking a plankton as it passes in the current, there were other goings on. Males, conspicuous in their distinct livery, were evenly distributed about the shoal, their territories remaining in spite of the constant motion of the shoal and, perhaps surprisingly, without constantly fighting with each other. Familiarity with their neighbours means they do not have to display to each other all the time, allowing time to feed and attract the attentions of the females. I could

Looking into the Global Aquarium

not resist the urge to mentally superimpose an outline of an aquarium over the shoal of *Pseudanthias squamipinnis*.

What size would I need to effectively capture a group of females with three or four males, each within their territory? The answer, as I had feared, was an unfeasibly large one, though the idea

of a small shoal continues to intrigue.

The Omnipresent Butterflyfish

Major components of the underwater scene are, of course, the butterflyfish and it was not long before a pair of *Chaetodon bennettii* swam by, searching for food amongst the pristine coral stands. My heart sank after the dive when I read that this stunning species is strictly a browser of

Corythaichthys amplexus, the Banded Snake-Pipefish was observed in deep water foraging over boulder surfaces.



Gaterin orientalis, Oriental Sweetlips, self-possessed predator resting atop a pristine coral head.



coral and therefore impractical for the home aquarium. The same also sadly applies to *C. meyeri*, a quite distinct species with an unusual black patterning over a slaty blue background. Even with such species precluded from selection as a consequence of their specialised diets, the range of Butterflyfish one could include in a 'Similan Island' display would not be restrictive by any means. There was the perennial favourite, *C. auriga*, that was encountered two or three times on this first dive, and on numerous occasions subsequently. This is the Threadfin Butterfly, so named because of the extended trailing edge of the dorsal fin which is omnivorous by nature and malleable enough to thrive in a fish tank. Amongst the other suitable species that crossed our paths on this first dive were *C. melannotus* and *C. lunula*. *C. trifasciatus* was another encountered and observed foraging amongst not only coral but also over animal and plant encrusted rocks but I understand that this species can be a bit of a challenge when it comes to establishing at home, particularly with respect to feeding.

Upsetting the Natives!

Fascinating behavioural activities are as big a part in the attraction of keeping tropical marine fish as much as the outstanding colours. The same is true for diving and it was not long before I was holding up my dive buddy's exploration by remaining stationary in front of an Anemonefish and its host

Looking into the Global Aquarium

Sea-Anemone. Such is the value of a territory like the one I was gazing at that Anemonefish like this resident Amphiprion akallopisos value them highly enough to defend them with vigour against anything that it thinks may have designs on its abode. The bright yellow rim of my face mask less than one metre away proved too provocative to ignore as the diminutive but plucky fellow sallied forth repeatedly biting the mask's rim. Indeed a plaque of eggs on the rock at the base of the Anemone indicated that I was incurring the wrath of a devoted mother, so I retreated, humbled and with respect.

Voyeurism

With the dive completed we adjourned for lunch and relaxation on the afterdeck and I worried that this level of unimaginable beauty and richly fulfilling experience was unsustainable. Surely subsequent dives would be anticlimactic, unable to match the first. So with the second dive at so called Turtle Rock I took the plunge in trepidation, unable to think what would prevent it from being a mere shadow of the first dive. A similar parade of fish as encountered in the first dive was enhanced by the appearance more species to add to my 'tick list' and also the joy of watching several species spawn. This was the last dive of the first

day and so dusk was approaching which is the preferred time for tangs and butterflyfish to scatter their seed in the currents of the water column. Pairs of tangs

were seen swimming side by side, touching as they rapidly accelerated along the reef edge then upward two or three metres into the water column to release their spawn before peeling off (Red Arrows style) and dropping back to the sanctuary of the reef. Powder Blue Surgeons (*Acanthurus leucosternon*) and Lined Tangs (*A. lineatus*) were amongst those seen participating in this activity. Pairs of Fusiliers were breaking ranks from the dazzling shoals and doing likewise to release egg and sperm into the plankton and away from the mouths of their colleagues in the shoal.

During this dive we crossed patches of sand which were not to be ignored as unworthy of attention. Another favourite of mine are the jawfishes and over this sand, wherever a rock was present, invariably there would also be an excavation under it. At the entrance, perched on the raised lip of the excavations would be one, or a pair of these charming fish or Gobies behaving similarly. They occasionally darted nervously away from their shelter to snap at passing food but more often they shot into their burrow at my approach. They must lead a very precarious existence to behave so cautiously. On one or two privileged visits to these burrows I was able to spot the powerhouse behind these excavations, that were such a prominent feature of this aquascope, the Burrowing Shrimp that does the digging whilst the fish watched for imminent danger with enough paranoia for

Chaetodon auriga, Threadfin Butterflyfish. Frequently encountered, attractively-patterned and suitable for the home aquarium.



bath fish and shrimp.

Although frequently seen on the reefs proper, on this and subsequent dives, the goatfish (*Upeneus* spp.) were best observed over sand where they could be watched foraging with their pair of chin barbels probing the substrate for burrowing invertebrates. This was best achieved by lying on the sand and breathing very gently. The noise of the breathing apparatus was one that these fish were unaccustomed to and, therefore, wary of, even if it didn't startle them into flight.

Moving back over the reef and I was reacquainted with another set of price fish, the ever-graceful Angelfish. They are so well named because of their poise and elegance. Royal, Regal, Emperor, Blue Faced, Three Spot and Koran were all observed and admired on this dive and I could clearly see why they are so highly favoured in the home.

Continuing the Theme

By the fifth dive of the trip I no longer worried about being underwhelmed by any forthcoming dive spot and indeed this one, at Hin Pusa (Elephant Rocks) was probably the best of them all.

First of all there was the stunningly impressive terrain with a cascade of boulders, some larger than elephants, sloping down to sand at 2.5m which extended into the proverbial wide blue yonder. The panorama was enhanced by the perfect visibility, being able to see in excess of 30m really allowed me to really appreciate the scale of the scenery. As I moved down the slope, accompanied as usual by shoals of Fusiliers, Rabbitfish and large pelagic Tangs (*Naso* spp.) with their pastel shades make-up, I came upon what can only be described as a pride of (BIG) Lionfish (*Pterois volitans*). There was in excess of a dozen of them holding position, effortlessly in spite of their seemingly cumbersome finery and contrary to the effort I required, up to one metre above the boulder slope and equally apart from each other. Needless to say there were no shoals of small fish here. A striking scene and quite contrary to image of the lurking menace of caves and overhangs.

Further on and some more big fish made their appearance including a gargantuan Giant Moray (*Gymnathorax javanicus*). Not a pretty beast but one that would be a good incentive for the kids to behave themselves. Large too were the Blue Fin Tuna, consummate high speed swimmers that flew by surprisingly close to us (alarmingly so in their unexpected proximity and appearance). They really are shaped to cut through the water and move without appearing to do anything to make it happen.

But it was not these that made the

dive so fascinating, it was the small stuff. Slowing down and turning my attention to the boulder surface I concentrated on the enormous variety of encrusting invertebrates packed in tight where the little fish were to be found foraging (and living) amongst it all. Blennies and tiny Gobies popped in and out of their equally diminutive homes, always entertaining. So too were the Banded Snake Pipefish (*Corythoichthys intestinalis*) somewhat of a surprise to see it here as I thought it to be more a denizen of coral rubble and lagoons. Even so they were a joy to watch with their pivotal popped out eyes and methodical and sinuous exploratory movements and for a while took centre stage ahead of the big names of the reef scene such as the Emperor Angels browsing the encrusted rocks nearby. A selection of these diminutive species, which would also include some Wrasses, Damsels and Dwarf Angelfish (amongst others) would create an interesting aquascope as any tank designed for the big and bold species.

The Mighty and the Meek

Talking of sinuous movements, dive number 9 was specifically tailored to

maximise the probability of encountering Sea Snakes. We had sailed round to a quiet bay just off Koh Pabu (Island 7) where a broad, extensive stand of Stagshorn Coral was to be found in shallow water.

Again the scenery was sufficient reason to take to the water. Reefs with a variety of coral types are a delight but so too is a forest of Stagshorn Coral. With such a multitude of hiding places that this branching structure provides it was no surprise to see a multitude of small Damsels, Wrasse, Chromis, Dwarf Angels and so on. These little fish were great to watch when they darted back as one into their own bit of the reef as the other divers passed by them too close for comfort. And also when they were back up in unison into the water column to feed in the gentle current. *C. meyeri* was encountered again here, in what would be their idea of heaven for not only are they specialist coral polyp grazers but even within that specialist they go

further in clearly favouring Stagshorn.

With small fish bountiful it was not at all surprising, but a delight nonetheless, to presently come across a Yellow Lip Sea Krait (*Laticauda colubrina*) probing the interstices of the tangle of coral. At a distance of half a metre I could clearly see the searching of the snake deep into the nooks and crannies as well as note the paddle-like tail quite unlike the smoothly tapering form of its terrestrial cousins. Remembering their reputation of being the most venomous of all snakes, I snapped out of my reverie and eased away. This was a sensible move as the snake withdrew from its searching and headed for the surface as I guess that a Sea Snake in need of a fresh lung full of air is less likely to be as peaceful as I understood them to typically be. I was correct in my belief in their unassuming demeanour, with deaths occurring mostly as a consequence of being bitten by those that caught in fishing nets and hauled on board small fishing boats by barefoot crew.


To me there was a great paradox between the Snake's manner and that of my next encounter, with a Green Chromis whom, having spawned with a female on his algal turf, took great exception to my close proximity and vehemently attacked! By the end of the trip my face mask was beginning to look the worse for wear.

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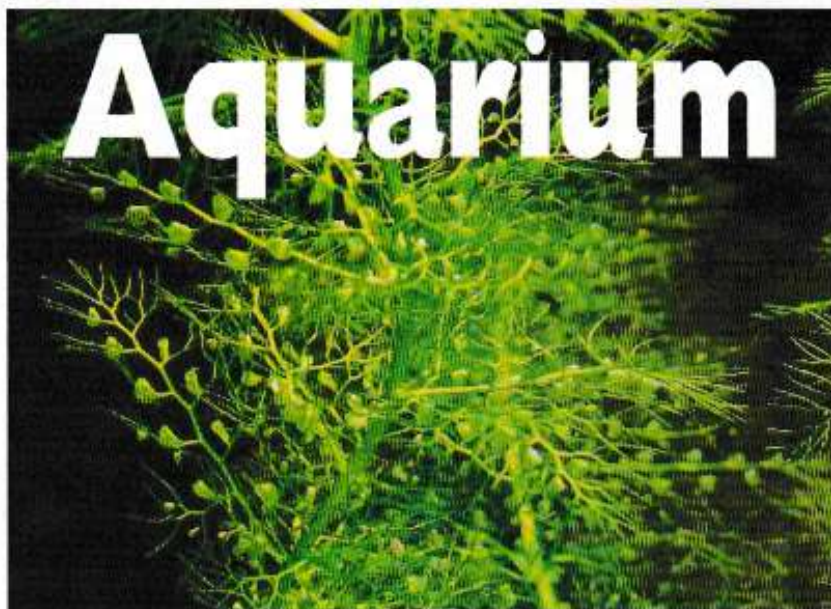


Available from your nearest aquatic retailer.
Manufactured by:
Thorne Electrim Limited
Stonfield Park, Martins Lane, Chilbolton,
Stockbridge, Hampshire, SO20 6BL

Gordon Walker finds that aquatic insect-eating plants for aquarium culture make an interesting diversion

PHOTOGRAPH BY M.-P. & C. PIEDNOIR; GRAPHICS BY THE AUTHOR

Carnivorous Plants for the Aquarium



Most plants that eat insects come from nutrient-free soft acid waters.

One of the easiest of all the carnivorous plants to grow in aquariums, or even goldfish bowls, are the Bladderworts of the genus *Utricularia*. Most plants that eat insects come from nutrient-free soft acid waters. I know of several special locations — sites of scientific interest — where our native species, *U. vulgaris* or Greater Bladderwort, is common; the water is pure and very clear, and the Bladderwort is growing in common with native *Myriophyllum* and *Potamogeton crispus* and white Scottish Water lilies *Nymphaea alba*, no Blanketweed

or algal bloom caused by agricultural fertilisers here! Greater Bladderwort tolerates hard water but in nutrient-rich locations is plagued by strangulation from that horrible Blanketweed. The solution to this problem requires shade which can be provided by using Duckweeds to cut off algae-encouraging light.

'DIY' SOFT ACID WATER

If you're unfortunate in having very hard tapwater in England, buy a gallon of distilled water from a chemist — it's very cheap and has

no chemicals or nitrate, obviously, which would encourage algae. You could also collect rain water but I would prefer a sure source of chemical-free water.

To grow any Bladderwort species here is a peat soup recipe to create ideal water conditions: Add one third of a cup of Moss peat (not Sedge peat) to a pint of distilled water in a glass bowl; leave for 24 hours, strain out the peat and store the whisky-coloured amber fluid in a pint bottle. Once any mulm has settled you have a concentrated 'Black water'; add this to the remainder of the gallon and you have made ideal soft acid water for growing your

Bladderworts.

Any small bowl or aquarium can be used to house a collection of aquatic Bladderworts; a north-facing window ledge is best suited as fierce direct summer light can overheat small vessels in a southern location. However, for the student of biology, the inquisitive teenager or the tired executive (or magazine editor), the addition of an aquarium hood and light will allow many hours of fascination, during night and evening viewing.

Watching the large traps of Greater Bladderwort consume small water creatures conjures up the deadly efficiency of Nature's solution to nitrogen-deficient waters where most plants would starve.

Daphnia, Cyclops and tiny Midge larvae are trapped with consummate skill in a simple trigger and pressure trap.

Once triggered the Bladder sucks and draws in its victim to die and be

Carnivorous Plants for the Aquarium

digested, a process most frequently studied using Greater Bladderwort whose traps are around 3mm in diameter.

ENCOURAGING EARLY GROWTH

In aquaria use an inert gravel to cover the bottom and a few pieces of interesting bog wood as decoration. The Bladderwort can be tied loosely to the bog wood with raffia or nylon fishing line. The Bladders will try to regain a floating position and this treatment encourages early growth and division of the stem. Some authors would advise leaving the plant floating on the surface; however natural this is the result is

usually that the stem grows fast at one end whilst dying at the other whereas my method encourages branching. If the stem breaks while growing upwards you have the chance to create several new plants from the broken pieces.

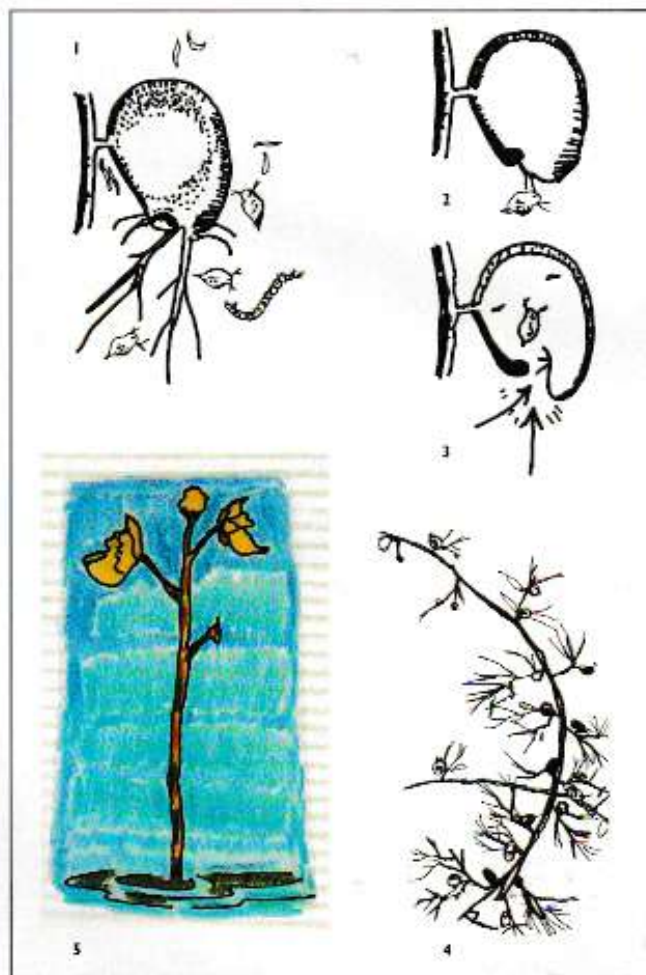
The water in your new aquarium or bowl is virtually sterile and will not support any water creatures for the plant to devour. Add some (not a lot!) of natural plant debris in the form of mulm from an established pond or aquarium; if you can't do this a slice of banana skin will do. Soon you will notice a slight cloud around the skin as new bacteria and infusoria grow. After a week add a few Daphnia from your local pet shop as food. You might have to add a bag every month or so depending on how they breed in the less than ideal Daphnia-propagating conditions of low light and low nutrient levels required to discourage algae.

BEGINNER'S PLANT

Greater Bladderwort is a uniquely fascinating beginner's plant recommended for those interested in aquatic life. Given similar conditions reproduced outside it will grow happily in rainwater butts or sinks flowering with tall yellow Mimulus-like flowers. In winter it sinks and forms Pea-sized resting buds. Remove falling tree leaves from the container (or prevent their entry with nylon mesh), to prevent nutrients entering the system. In summer extra shade can be provided with Duckweed, Riccia, *Azolla carolina* or *Nymphaodes aquatica*, an ideal plant with complementary small fringed lily flowers.

Remember to buy your Bladderwort from a cultivated source not to collect it from the wild. Join groups dedicated to protection of the local environment, they will campaign to protect this precious plant and the water conditions it requires to survive.

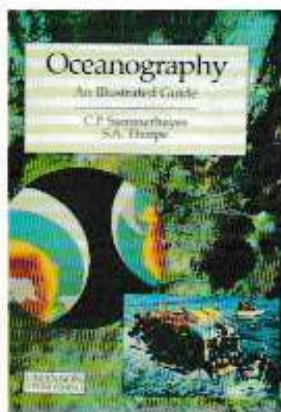
Greater Bladderwort, a rarity in many areas, gives that touch of something unique and special to our native natural world.



- 1 BLADDER TRAP SHOWING TRIGGER HAIRS AND PREY, DAPHNIE, BLOOD WORMS, MICRO WORMS
 2 TRAP IS READY TO SPRING
 3 PARTIAL VACUUM SUCKS PREY INSIDE
 4 STEM OF PLANT WITH TRAPS
 5 QUICK SKETCH OF FLOWER STEM

Andy Horton's

Top Ten Bo



(2) ▲ Oceanography: An Illustrated Guide

Edited by: **Dr C. P. Summerhayes & Professor S. A. Thorpe**
(Southampton Oceanography Centre)
Manson Publishing Ltd
Softcover: **£24.95**

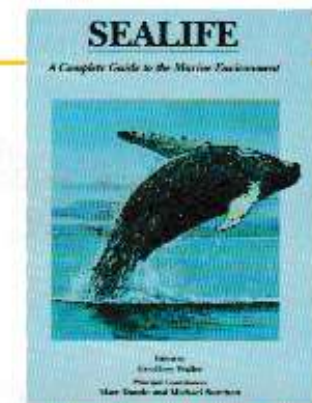
Hardcover: **£48.00**

ISBN: 1-874545-37-5 (Softcover)

ISBN: 1-874545-38-3 (Hardcover)

Mostly new stuff about the oceans of the world in this book, with the latest developments and information previously only available in technical papers, this book may prove too difficult for readers without a scientific background.

However, if you enjoy the Open University television programmes on oceanography this book will appeal to you. The book is well arranged with colour photographs and lots of graphs and diagrams.



BOOK OF THE YEAR

SEALIFE: A Complete Guide to the Marine Environment

Edited by: **Geoffrey Waller**

Principal Contributors:

Marc Dando and Michael Burchett

Pica, 1996. RRP: **£30.00**

ISBN: 1-873403-26-7

If I was asked to recommend one book for the reader to be informed about the oceans of this planet and creatures that live in it, this is the book I would pick. It is absolutely packed full of facts with both colour and excellent black and white illustrations and diagrams. It is a comprehensive introduction and features the life below and above (sea birds) the waves. This well written reference book is extremely good value.

◀ (3) Under Northern Seas

By: **Linda Pitkin**

Salamander Books Ltd, 1997

ISBN: 0-86101-973-3

Wow! was my first reaction. This is a coffee table book with large pages full of fantastic underwater photographs of the sea life around the British Isles, and is both a 'Work of Art' and the best advertisement for conservation and protection of our valuable marine wildlife habitats.

The text is well written and organised according to the habitats as seen by divers. All the photographs are good enough to grace any wall. It is an ideal Christmas present.



(4) ▲ Collins Pocket Guide — FISH of Britain & Europe

By: **Peter J. Miller**

Illustrated by: **Mick Loates**

Collins, 1997

RRP: **£12.99**

Special Offer of **£10.99** for BMLSS

members

ISBN: 0 00 219945 9

This new Collin's Guide is far more accurate than the previous Collin's guide especially for the small rock pool fishes. It is the best budget guide available for the fish found around Britain and in the Mediterranean and adjacent seas and rivers. The fish are described phylogenetically, according to the

families, and not according to the habitats in which they are found.

(5) ▶ Collins Watch Guide No. 5 — Seashore

By: **Jean-Baptiste de Panafieu**

Translated by: **Josephine**

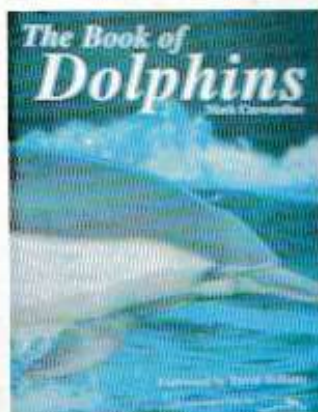


Books of 1997

Weightman

Harper Collins, 1997
Recommended Price: £5.99
ISBN: 0-00-220088-0

This handy guide for novices to the seashore and children is the best one this year and was reviewed last month.



(6) ▲ The Book of Dolphins

By: **Mark Carwardine**
Dragon's World, 1996
Price: £18.99
ISBN: 1-85028-338-9

This beautifully written book presents all the known facts about the marine mammals with the common name of Dolphin with over 100 excellent colour photographs.



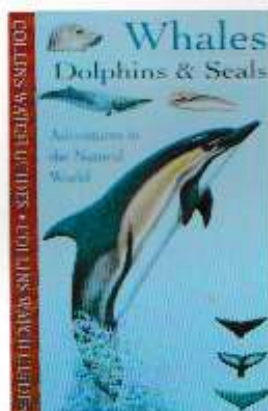
(7) ▲ Collins — Sharks & Rays
Consultant Editor: **Leighton R. Taylor**

Collins, 1997

RRP: £16.99
ISBN: 0 00 220104 6

Despite the scores, perhaps even hundreds of books about these underwater predators, I found that there was not a popular book on sharks I could recommend until this book was published.

The Field Guide includes all the major families of sharks and rays with a colour photograph for every one including the newly discovered Megamouth. A list of all the shark species in the world was omitted. There is a thorough treatment of the biology, evolution and habitats in which sharks and rays are found. Special Offers are available at W. H. Smith & Sons.



(8) ▲ Seahorses — Conservation & Care

By: **Neil Garrick-Maidment**
TFH, 1997
Price: £7.95
ISBN: 185279071-7

Neil Garrick-Maidment runs the Seahorse Nature Aquarium in Exeter and he passes on his knowledge of keeping and breeding them in captivity in this small book. The most important snippet of information is on page 15 when it says that adult seahorses eat about 40 mysid shrimps a day. Feeding live food to seahorses is more likely than not to be an insurmountable problem for the home aquarist, and anybody wishing to keep this fish will need to buy this book.

If you are just interested in these fascinating fish the 48 page book contains information not published elsewhere.

(9) Intertidal Ecology

By: **David Raffaelli and Stephen Hawkins**

Chapman & Hall, 1996
ISBN: 0 412 299607 (pb)
ISBN: 0 412 29950 X (hb)

This book is designed for the young scientist studying the intertidal zone on all types of shore. It is a difficult read even for the experienced seashore ecologist and is included on the list because it is the only book of its kind, more akin to the oceanographic text than a biological treatise. Readers of this column will probably appreciate a simpler book on this subject, including one co-written by Stephen Hawkins.

(10) Encyclopaedia Britannica CD '97 CD-ROM

The reader may be surprised to find a review of this reputable general encyclopaedia in a magazine on marine life. However, if you or your School Library can afford it, this is the best source of accurate information on oceans and marine life, and much more, including information of palaeontology and prehistoric reptiles. The text is the same as the book volumes.

Britannica is viewed using Netscape Navigator and the search methods and the ability to print out the text makes it an improvement for finding out the information. The appearance on the screen is dramatically better than the cheap CD-ROM encyclopaedias. This is the future.

There are major drawbacks, at present. The full gamut of black and white illustrations are not included and there are no colour photographs, sound or video sequences. Both English and American spellings are included and either can be chosen.

It might be best to wait for the planned upgrades. Meanwhile, Microsoft Encarta '97 also provides some good information on the oceans and marine life and the sequence and explanation on Tides is worth looking at and listening to. The Encarta search methods are not a patch on Britannica.

Budding biologists should have a look at the following CD-ROM:

Five Kingdoms: A Multimedia Guide to the Phyla of Life on Earth

By: **L. Margulis and K. V. Schwartz** + other scientists
ETI Expert Centre for Taxonomic Identification, 1996

Dick Mills shows that fishkeeping certainly doesn't lack variety

PHOTOGRAPHS BY A&P LIBRARY

Looking Beyond the Aquarium or Pond

Researching
the contents
of a local
stream.



If there's one thing that fishkeeping doesn't lack it's variety or, to put it another way, there's plenty of opportunities to change your mind or to take up a different line of interest.

To deal with things in the aquarium or pond for instance, you can easily concentrate on the fish or the plants; you might get into a geographic aquarium (almost certainly after reading Ted Caletti's articles!), you might concen-

trate on breeding and developing your own favourite strain of species. With tropical and coldwater version of freshwater and marine areas to choose from there shouldn't be any shortage of things to do. However, all the previ-

ously-mentioned activities are pretty well concentrated in one spot and yet there are other fishkeeping related activities worthy of attracting your attention.

The summer months are ideal for getting out of doors and yet still continue to follow your favourite pastime without too much of all that business of physical exercise.

One good (and often productive) activity is the Pond Hunt. As its name suggests, this involves taking over a local pond (or stream for that matter) and seeing what you can find in its depths. You can easily bring in an element of competition into the proceedings by involving a group of people instead of going it alone: give each person a plastic tank in which to store their catches and award points for each different species caught — be it fish, invertebrate life or plants. Expanding on the theme in a slightly different direction can provide such comforts as a barbecue and refreshments after the catching has finished and while judging is taking place. Naturally, all livestock is returned to the pond at the end of the proceedings.

There are one or two precautions to be taken, even with this apparently safe activity. If the pond is in a public park then permission must be sought from the appropriate authority but this is usually obtained fairly easily, especially if the activity is described as educational (doing research, or an annual 'census' on the pond or stream's inhabitants for

example). But do remember to provide the authority with a full results sheet of your 'findings' if this is the approach you have to take to get permission in the first place!

A not unexpected variation on this theme is, of course, the Sea Hunt — again held in the summer months. A further factor to consider this time is to arrive at the sea shore just before low tide so that you have maximum time to investigate (and collect) the inhabitants of the many rockpools. Similarly, a competitive event can be set up. With this activity, there is more hazard from slippery seaweed-covered rocks and the incoming tide. As a consideration to the animals involved, any tanks used to temporarily store the catches should be relatively large enough to prevent overheating occurring on a hot day — you could always have a 'water-changing' team standing by to keep things cool. Most important of all is to leave every rockpool as you found it: upturning and moving rocks in pursuit of your quarry will leave any remaining animals without their permanent homes — always replace any disturbed rocks and if you are collecting invertebrates such as Sea-Anemones please do so with them still stuck on to their rock.

It is not uncommon to find local bodies organising activity days on the beach and A&P's Andy Horton gets involved in an annual event such as this. You can usually find out about such things from the local library.

With the upsurge in the building of

public aquaria there is bound to be one near most people. The number of Sea-Life Centres is increasing all the time and new aquariums seem to be planned or announced every few months, the latest being the Blue Planet at Ellesmere Port in Cheshire which is due to open next year. In recent months we have reported on Aquariums as far apart as Banff (the Macduff Marine Aquarium), Newby Bridge in the Lake District (Lakeside Aquarium) and the new London Aquarium.

If you belong to an Aquatic Society you have an advantage for there is often a chance to have an experienced guide to show you around, not just in the public side of the aquarium glass but also 'behind the scenes.' Such visits should be well organised, and arranged well ahead of time. As the emphasis is on education and informing the visitor about local aquatic life the visit can also take the form of an educational adventure trail; many Centres offer printed packs for the use of youngsters to make their visit even more memorable and action-filled.

On a slightly different tack, it can be a useful idea to record any activity or visit on videotape for future reference. A video record can be very useful as an 'aide-memoire' when planning a new pond design: visit one or two Garden Shaws (such as Chelsea, Hampton Court or NEC) and come home with a tape full of ideas which you might be able to transpose into your garden.

The home aquarium is filled with



Reviewing the 'catch'.

potential photographic subjects (finding out how to capture them successfully is often an adventure in itself) and with modern photographic or video equipment you ought to be able to capture all the favourite actions taking place behind the front glass. This really is the best way to record the spawning activities of your fish or the design of your favourite furnished aquarium.

The Serious Side

It is not unknown for any aquarist who has been seriously bitten by the fishkeeping bug to consider making a living out of the hobby (following a hobby and getting paid for it is a tempting idea) or perhaps delving deeper into the scientific aspect.

To take the latter course first, a few years ago now (isn't it always the way

Looking Beyond the Aquarium or Pond

that apparently more interesting things occurred in the past?) several museums that had aquatic sections ran evening classes for ichthyological matters. The British Museum (Natural History), to take but one example, offered Diploma Courses for those attending and of course no little emphasis was placed on the taxonomic classification of species. It would be enlightening to see if some pertinent enquiries to such institutions as universities and/or museums would revive this idea. If any Curators are reading this they are more than welcome to let us know of any such courses that might still be available.

Turning to 'jobs for hobbyists' the real upsurge in qualification-seekers has been the immense success of college-based courses, such as those offered by

Sparsholt College, which enable successful students to be placed into the trade at the end of their studies. The drawback of some of these courses is that they are generally residential or need to be attended over a period of weeks or months on a consecutive basis; this makes it awkward for the would be, part-time student.

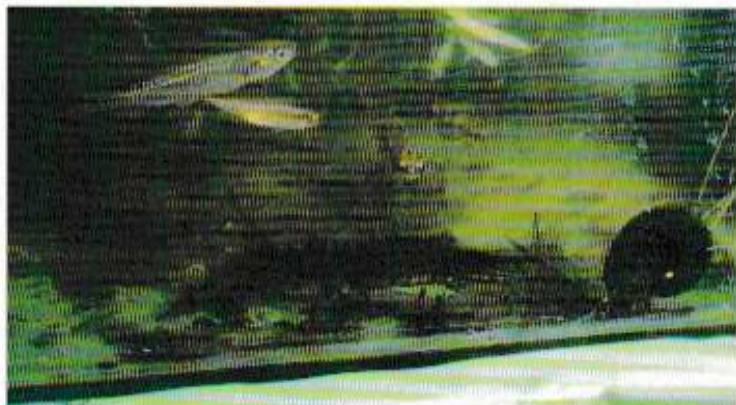
With the rising number of garden centres and the growing awareness of water gardening there ought to be courses for this subject too; one such course is available from the Institute of Garden Design whose address is shown below.

At the bottom end of the educational scale the National Curriculum does offer some level of animal husbandry interests at 'pet care' level whilst mention should also be made at the proficiency awards made in youth organisations such as Guides, Scouts and Duke of Edinburgh Award Schemes, etc.

A
Stickleback.



A mixed bag
of fish,
amphibians
and molluscs.



Useful Addresses

Sparsholt College
Hampshire,
Sparsholt,
Winchester,
Hampshire SO21
2NF.
Tel: 01962 776441.
Fax: 01962 776587.

Fish Department,
British Museum
(Natural History),
Cromwell Road,
London SW7 5BD.
Tel: 0171 938 9123.

Brooksby College,
Brooksby, Melton
Mowbray,
Leicestershire LE14
2LJ.
Tel: 01664 434291.
Fax: 01664 434572.

Hartpury College,
Hartpury House,
near Gloucester,
Gloucestershire
GL19 3BE.
Tel: 01452 700032.
Fax: 01452 700629.

Institute of Garden
Design, PO Box
1561, Wedmore,
Somerset BS28 4TD.
Tel: 01934 713563.
Fax: 01934 713492.

SHORE WATCH



BY
ANDY
HORTON

NEW WEEDS ON THE BLOCK

In the summer of 1996 Dr Bob Fletcher discovered an unusual seaweed on a portoon block in Southampton Water. As a phycologist, or seaweed expert, he was able to identify the species as *Undaria pinnatifida*. However, this species is not native to European or even the Atlantic Ocean and actually comes from the Pacific Ocean in Japanese seas where it is eaten and known as Wakame. It has been christened Japanese Kelp in this country and since the original find other growths have been discovered at other places on the northern English Channel coast.

How did it get here? The most likely explanation was that the weed was accidentally introduced with oysters imported into France, and then spread as fouling growths on the hulls of ships. The weed is fertile and it will probably establish itself as an unnecessary and possibly unwelcome addition to the marine life around Britain. Japanese Kelp can grow to one metre in length and resembles the native species called the Dobberlocks, *Alaria esculenta*.

This example illustrates the danger of introducing foreign species that can arrive complete with parasites and unwanted guests.

THE ALIENS ARE HERE ALREADY

This new weed should not be confused with another alien, the Japweed, *Sargassum muticum*,

In the column for the year I will examine some aspects of the biology and behaviour of the rock pool

fish and marine invertebrates that are both interesting and useful knowledge for aquarists.

Seahorses have been recorded on the south coast of Britain and records have been kept of the captures in the last few years. Two species are recorded as part of the British fauna. This is *Hippocampus ramulosus*, photographed at the Seahorse Nature Aquarium, Exeter, where a breeding programme has been successful.

PHOTO: ROBERT JONES



which was first noticed in the 1970s. This straggly weed is common all along the south coast and has a penchant for fouling propellers. The danger of introduced weeds is that they may prove to be more successful than the native species and displace them reducing the fauna bio-diversity. The extent to which *Sargassum* has done this is debatable.

Alien creatures have been part of the British marine fauna for over a century. After the Victorians decimated the native Oyster, *Ostrea edulis*, by overfishing, the problem was further compounded by the seeding in beds offshore of American Blue-Point Oysters, *Crassostrea virginica*.

This had the unfortunate effect of also bringing with a marine snail (gastropod mollusc) called the American Oyster Drill, *Urosalpinx cinerea*, which feeds on oysters by drilling a hole in the thick shell and sucking out the rich flesh. Unfortunately, it will also eat the native Oyster and when they are not available it will make do with Mussels.

But even the arrival of this predator was not the worse result of the introduction of the alien oysters. On Sussex beaches the strandline is always littered with hundreds of slipper-like shells.

These are washed up Slipper Limpets, *Crepidula fornicata*, an unusual hermaphrodite mollusc that hitched a lift with the American Oysters and flourished in the English Channel. It was so successful that it competed with and displaced the native Oyster, filtering the plankton from the sea in the same way as an oyster

does. It proved to be such a serious pest that it for a century has prevented the re-establishment of the once extensive oyster beds in the English Channel. For years divers would only see an occasional Oyster, but the last two summers have been hot, and small Oysters can even be found cemented to rocks on the beach.

TRANSPORT OF ALIEN ORGANISMS

As the sea flows all around our planet you may interdict and think that there is nothing to stop fish swimming where they want to and spores and larvae in the plankton drifting with the currents.

However, there is one major barrier that prevents this from happening. Sea temperature varies throughout the seas and oceans and the animals are unable to cross the barrier when the temperature is outside the range in which they can live.

Aquarists will know this very well, as maintaining the correct temperature for the fishes and other creatures in their tanks is the number one requirement.

However, when man intervenes this barrier can be crossed sometimes with disastrous consequences. One method which this can happen is by the discharge of ballast water from merchant ships which has been responsible for transferring serious pests like predatory Starfish and poisonous algae from Japanese seas to Australian seas.

VAGRANTS

Seasonal migration



The Portuguese Oyster, *Crassostrea gigas*, is cultivated (the spot is transplanted to south-west England) but it does not reproduce in British seas. Common Starfish, even small ones as seen in the photograph, are a serious predator feeding on the small newly-settled Oysters. PHOTO: ANDY HORTON

of species occurs regularly in the oceans. As the seas warm up around the British Isles shoals of fish like Mackerel and Grey Mullet move up the west coast of Britain every year.

Occasionally, unusual southerly

species make their own way into our waters. Many are doomed to perish during the coldest of winters and unable to maintain a permanent population. They are called vagrants and attract the excitement of finding something

rare or unusual. Triggerfish, *Balistes capricus*, have been caught every year for the last decade in the English Channel. In the spring of 1997 appreciable numbers were caught in spring for the first time and they may have started breeding.

This summer two specimens of the Knobbed Triton, *Charonia lampas*, were discovered off the south Cornish coast and returned to the sea. Only 12 records of this large marine snail have ever been recorded from British seas*. In

December 1996 Jon Makeham discovered a specimen of the sea slug, *Tyrodina perversa*, on the shore at Looe in Cornwall. It is the first recorded record of this nudibranch in British waters and is usually an inhabitant of the Mediterranean. It is known how it arrived on these distant shores.

SEASONAL GREETINGS

I wish all readers a Happy Christmas and Best Wishes for World Oceans Year 1998. Next year we plan to extend the

Shorewatch Reporting Scheme whereby visitors to the coast can send in reports of what they find between the tides. Special Report Cards are available from the British Marine Life Study Society address below. It is unlikely that much will be found between the tides during the winter and I will be able to provide more information about biological recording in this column in January.

REFERENCE

* Report by Stella Turk in the *Journal of Conchology*.

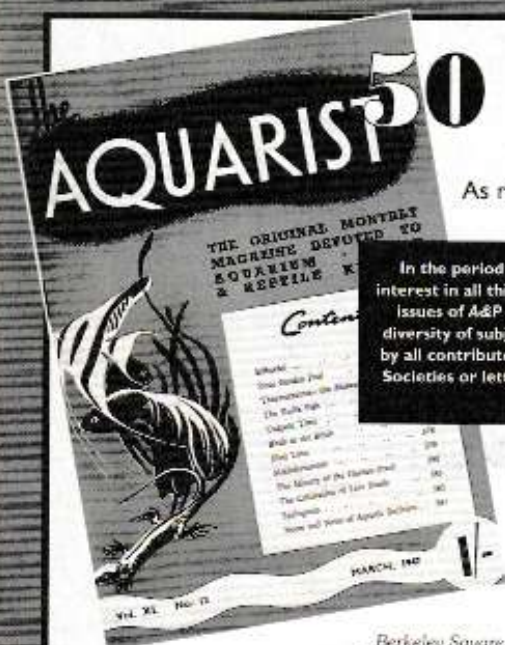
Slipper Limpets (left) with a small European Oyster. PHOTO: ANDY HORTON



The British Marine Life Study Society will help readers who have any difficulties or wish to pursue their interest in the marine life around the British Isles. The first enquiry will be answered free of any charge, but please enclose a SAE. For more information write to: Andy Horton, British Marine Life Study Society, Glaucus House, 14 Carbyn Crescent, Shoreham-by-Sea, Sussex, BN43 6PQ. EMail: 106127.206@CompuServe. Internet URL: <http://ourworld.comuserve.com/homepages/BMLSS/homopaga.htm> (England) Internet URL: <http://www.ed.ac.uk/~ovah01/bmlss.htm> for BMLSS (Scotland).

AQUARIST 50 Years Ago ...

As recounted by Editor Dick Mills



In the period immediately after the war the increase of interest in all things aquatic was rapid. Looking through past issues of A&P makes interesting reading not only for the diversity of subjects raised but for the apparent enthusiasm by all contributors whether they be authors, reporters from Societies or letters from readers. December 1947 threw up this selection of topics ...

Well? Did they get the crowds?

Readers of last month's FYA may recall that an attendance of 30,000 people was anticipated at the Scottish Aquarium Society's Annual Show. A 'post mortem' in December revealed that 18,046 paid admissions occurred. A sobering thought for today's Show organisers might be this extracted paragraph from a report by Strachan Kerr, having discussed the physical organisation and benching arrangements of the Show, he continued:

"Our final departure from the orthodox is in the matter of plants. In our early days we quickly realised that 'John Citizen' who pays his bob (one shilling — 5p — and not 10p as mentioned in FYA A&P, June 1937 — Ed.) and, therefore, pays for the Show, was not terribly interested in a plain cube of water with a fish swimming around in it. We, therefore, obtain plants (which we sell to our members at the end of the Show) up to a number of about 1,000 and with the aid of lead weights and Dorset pea gravel, make each tank as nearly as possible a complete aquarium in appearance."

Christmas Poem by 'Silurus'
It was Christmas Eve in
Parson's Green,
It was Christmas Eve in
Crewe,
It was Christmas Eve in

Berkeley Square,
And Chipping Norton too.
The snow lay thickly all
around —
The weather it was cool —
And ice had formed two
inches thick,
Upon the garden pond.
Into this seasonable scene
Came jolly Father Christmas,
From whose red face down to
his waist,
White whiskers formed an
isthmus.
Across the garden swift he
trod,
But noticed not the ice.
Alas, alack! With sudden
crack,
He vanished in a trice.
The contents of his sack were
spilled,
Among the fish and plants,
And icy water quickly filled,
His winter vest and plants.
In wrath he rose, but
instantly,
The water in him froze,
And held him standing stiffly
in,
A decorative pose.
What wonder then, on
Christmas morn,
The family stood in awe.
To see a statue in the pond,
Where none had been before.
"Bad taste!" said father,
"Elves and gnomes
Are not the things I like —
And what is this — a Fantail
Shu,
Careering on a bike?"
Two Goldfish busy playing
trains,
A third in Cowboy's dress,
Several playing lexicon.
Said father: "What a mess!"
They tell this tale in Parson's
green,

They tell this tale in Crewe;
In Chipping Norton, Berkeley
Square —
I hope it isn't true.

Benhurst A.S. members had some varied entertainment varying from Mr Sloccombe, one of our members, giving an interesting account of his many weird and wonderful experiences as a deep-sea diver and our Chairman, Mr Dunkerley, spoke to us on various aspects of water, colouration of Goldfish, and the potentiality of the thermostat over atmospheric conditions.

A sign of the future times was perhaps seen at Blair A.S. Fluorescent lighting was tried out in a tropical set-up.

Croydon A.S. had expected Mrs Winifred Meadows to relate her experiences in the breeding of tropical egglayers but the day proved one of

lousy fun and the Secretary decided it was unfair of the Society to expect anyone to travel 30 miles and so asked Mrs Meadows to postpone her visit until more favourable weather.

Three very different mailings were received by Enfield & D.A.S. The first contained food from the New Zealand A.S. who had recently adopted the Enfield Society, another letter came from faraway Cook Island whilst the third contained an apology from a speaker who, because of the cut in the basic petrol ration couldn't fulfil a speaking engagement at the Society.

Merseyside A.S. had a visit by Professor Gordon of the tropical School of Medicine, Liverpool to talk on 'Aquatic Creatures in relation to tropical medicine'. Professor Gordon made us, as aquarists, feel quite important, mentioning that some very momentous discoveries had been made by laymen who had taken up a particular subject as a hobby and the field of science owed much to them.

And finally, on a sad note, the South West London A.S. suffered a very severe loss by the death of its Secretary as the result of an accident ... in the fog.



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Send in the Marines.

**101 Essential Marine Tips
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November



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A to Z of plants

K FOR ?

It is not an Editor's wish to wrangle out of obligations but, to be fair, the next letter in our alphabetical review of plants puts us in an undesirable position — we can't come up with a suitable species (without resorting to Common Names) beginning with 'K'. However, in order not to let readers down completely, we can pass on a couple of species that should do well in most conditions as might be encountered pondside or in a bog garden. *Kalmia* and *Königskerze* are more on the shrub side of the size scale than the usual marginal plant diversities. *Kalmia* spp. (now with the common name of Sheep Laurel (*K. augustifolia*) and Calf's Bush (*K. latifolia*), and, as members of the Ericaceae Family, prefer acidic soils to those containing lime. The evergreen leaves are similar in appearance to those of the *Rhododendron*. The white to pink summer flowers of *K. latifolia* are held in axils open in clusters and the whole plant can reach 10ft in height. *K. poliflora* grows springlike pale violet flowers with stems reaching only 1ft. *Königskerze* *primula* is a member of the Scrophulariaceae from Japan and is known as the Yellow Waxbell, which describes its pendulous, autumn appearing flowers nicely. It grows to around 4ft in height and has purple stems and Maple-like leaves.

L FOR LIMNOPHILA

LIMNOPHILA HETEROPHILA

It appears that everything in the aquarium is subject to change and this is certainly the case with this plant, which many more senior fishkeepers might know as *Ambulia*. Should you wish to increase the family to which this genus belongs it is called the *brachydanaceae* (brachydanaceae).

Description: The bright green, feather-like leaves are carried on upright stems but any confusion between this plant and *Cabomba* or *Menophyllum* is easily dismissed by virtue of the leaf shape and the thicker stems.

Distribution: India, Sri Lanka, China, Japan.

Cultivation and Propagation: This plant needs two things — crystal clear water, free of floating debris and pieces of light, but be sure all the available light energy is taken up by dense planting otherwise the leaves will soon be choked by less desirable algae. Propagation couldn't be simpler: any cutting taken from this plant will quickly re-root to establish another plant.

Other Species: *L. indica* — Tropical Asia, Africa, Australia. Where the previous species has white flowers with purple markings, this species has pale purple flowers. It is said that the juice from this plant is poisonous but whether this is to fish or man and in what quantities is not sure. *L. sessiflora* — Tropical Asia. Bright green leaves with blue white flowers.



By
**DICK
MILLS**

PHOTOGRAPH BY
M. P. & C.
PREDNOR

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BUY LINES

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Top of the range the Orion 4000 fountain pump from Cagex is proving to be every popular due to its excellent performance and sheer 'value for money' price. Its 3m head capability coupled with its 60 watt consumption and 3,800 litres/hour flow make it ideal for all pond applications. The associated Orionpond filter is designed on a 'surround the pump' form and its efficient sponge filter gives excellent mechanical and biological filtration results. It can be positioned easily and removed equally so for routine maintenance.

The Blulife range of 'ready to go' aquariums features four models — 50, 100, 150 and 200 litres (11, 21, 33 and 44 gallons) capacities — or, if you prefer it, 54x28x38cm, 70x35x46cm, 84x40x51cm and 100x40x58cm (21x11x15in, 27x15x20in and 39x15x23in). Each aquarium is complete with pump, automatic heater and all filtering material; the built-in filtration system can be pulled out for easy maintenance and

Creative Water Technology from Cagex.



NEW PRODUCT REVIEW FROM GLEE '97

the three largest sizes are equipped with twin lighting units.

• Details from the Sacem website at <http://www.sacem.it> or from: CAGEX ACCESSORIES LTD, Bury Farm, Pednar Road, Chesham, Bucks HP5 2JU. Tel: 01494 786759/792140.

BATSFORD

The creation of waterways in the garden has become very simple these days with the ready availability of preformed units on the market. The latest addition to the Simlstream range from Batsford recognises the need for even more 'adjustability.'

Whereas most cascades are straight or curved it can be problematical in confined spaces to get the units to follow a really tight turn. The new IN60 units look square in design but they

can be turned to at least 90° over each other which could make all the difference to completing your required design or not. Looking like light grey/white marble the vertical drop is quite shallow making the sound of moving water just that little bit more restful.

Further decorative structures for aquarium use are currently under development and undergoing 'field trials' and these will be added to the already wide range in the near future.

• Details from: BATSFORD PRODUCTS, Holly Lane Industrial Estate, Atherstone, Warwickshire CV9 2HA. Tel: 01827 713730. Fax: 01827 718679.

AQUARIUM PHARMACEUTICALS

New products from Aquarium Pharmaceuticals include The Step-by-Step Aquarium Set-up Kit, all new Powder 5-in-1 Water Conditioners, New Formula Proper pH, Stress Coat and Stress Zyme water conditioners and a Professional Freshwater Liquid Test Kit.

The Set-Up Kit is one affordable package that contains all the products and information needed to set up a 10 gallon aquarium — Ammon-Lock 2 (chlorine remover and ammonia

detoxifier), Proper pH 7.0 (automatically sets pH and detoxifies heavy metals), Aquarium Salt, Stress Coat, Stress Zyme, Dry-Tab tests kits (for pH, ammonia and nitrite) and the all-important Instruction Booklet.

The new 5-in-1 Water Conditioners set and adjust pH to the desired level, buffers water for long term pH stability, neutralises chlorine, adds Aloe Vera to help heal wounds and detoxifies heavy metals and provides necessary electrolytes. Four different levels of pH are catered for — pH 6.5, 7.0, 7.5 and 8.2 — and are available in 2x12g packets, 8.4oz, 16oz and 88oz sizes for the first three, with pH 8.2 coming in 2x14g packets, 8.4oz, 16oz and 33oz.

Stress Coat with Aloe Vera and Stress Zyme have been additionally packaged in a twin foil presentation trial size to

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relieve stress during fish handling and to develop the biological filter and maintain a clean, naturally-balanced aquarium respectively.

As might be presumed, the Professional Freshwater Liquid Test Kit contains all you need for comprehensive water testing — tests for two pH ranges (6.0-7.6 and 7.2-8.8), Ammonia, Nitrite, General Hardness and Carbonate Hardness; one dozen test tubes, laminated computer-analysed colour cards, water analysis pad for results and instruction book — and all enclosed in a sturdy waterproof box.

The company is also handling the full range of Rena products including the new Filstar Internal Filters. These employ triple filtration facilities — mechanical (standard), chemical and biological (both optional) —

RENA

ABOVE RIGHT
A selection of the range of Garden Ponds and Cascades from Lakedale.

LEFT
The new Rena Filstar Internal Filters from Aquarium Pharmaceuticals.

within the double canister whose design allows easy and spill-free removal for cleaning. All five models feature an output regulation, multidirectional water deflector and adjustable (rotatable) head and venturi facility on selected larger models.

• Details on the company's website at <http://www.aquariumpharm.com> or direct from: **AQUARIUM PHARMACEUTICALS/RENA**, 17 Abberbury Road, Iffley Village, Oxford OX4 4ET. Tel: 01865 712038. Fax: 01865 773242.

LAKEDALE

A full range of modestly-priced ponds and cascade units were offered by Lakedale ranging from the Derwent, a modest 12in deep, 17 gallon pond to

the largest 'monster' Loch Ness containing 310 gallons. Most of the designs have pre-formed pockets for planting marginal plants whilst the larger models have two shell depths and a continuous 'bio shelf' around the circumference.

A complementary range of leader pools, streams and cascades is also available.

• Full details from: **LEW WAYS LTD**, Walling Street, Cannock, Staffordshire WS11 3NB. Tel: 01543 375411. Fax: 01543 454536.

UNDERWORLD

The new SeaClone Protein Skimmer from Aquarium Systems can be used as a 'hang-on' model or situated in a sump. The most obvious feature is that initially the air column appears as a 'twister' tornado in the central column

before emerging as the familiar froth overflowing into the cup. The feature of the SeaClone is that it is driven by a Maxi-Jet Aquarium pump (included) which drives an air/water mixture created by a turbo-venturi effect through the reaction chamber in the spiralling action mentioned previously.

The importance of Specific Gravity measurement is well known in marlinist circles and the latest model, Aquarium System's Full Range Specific Gravity Meter extends its usefulness beyond the normal tropical marine range. The Specific Gravity range measured is from freshwater 1.00 to a full strength 'saltier' 1.030. This facility means that at the lower end of the scale brackish water aquariums can be monitored far more accurately than before whilst the upper value includes the 'higher than most other sea water areas' salinity of the Red Sea due to evaporation losses of the fresh water element.

Almost at the same time that sand became a truly 'active ingredient in fluidised bed filters, so too did it make its debut as an active decoration in such things as underwater waterfalls and cascades. One new design from Aquarium Systems is a Volcano which erupts red sand (to simulate lava) from the cone of an underwater volcanic peak to trickle down the mountainside before being re-circulated to do it all again. There is also an Underwater Waterfall in the range (for aquarium use) plus two Table-top designs — the Village Fountain and the Forest Fountain.

Most marine fish of vegetarian bent can be fed on such things as lettuce and spinach leaves but these must be scalded first to help break down their cellulose cell wall structure (remember any aquatic plant needs no supporting structure). In the Seauced Selects food range from Ocean Nutrition, natural sun-dried marine algae is ▶

Ullswater

Length / Length / Filter 48in / 17.5in
Width / Length / Bed 45in / 14in
Depth / Professional / Sub 5 / 10 / 14cm
Volume / Volume / Volume 22 gals / 120 litres



Bala

Length / Length / Filter 60in / 22in
Width / Length / Bed 55in / 18in
Depth / Professional / Sub 5 / 10 / 14cm
Volume / Volume / Volume 47 gals / 217 litres



Rutland

Length / Length / Filter 60in / 22in
Width / Length / Bed 55in / 18in
Depth / Professional / Sub 5 / 10 / 14cm
Volume / Volume / Volume 47 gals / 217 litres

BUY LINES

◀ used to duplicate the algae that marine fish feed on in their own habitat, as cellulose is not present the chlorophyll, pigments and natural proteins, amino acids and vitamins can be utilised completely by the fish. *Attaching Seaweed Selects* to rocks or to a lettuce. Clip the fish can graze on it as

NEW PRODUCT REVIEW FROM GLEE '97



The SeaClone Protein Skimmer from Underworld Products can be used as a 'hang-on' model or situated in a sump.

they would in nature. *Seaweed Selects* are available in three varieties — Red, Brown and Green — for marine species and in Green only for freshwater use.

• Details of Aquarium Systems products can be found on the Internet at <http://www.aquarium-systems.com> and information on all products mentioned obtained from: LINDERWORLD PRODUCTS, Units 1 & 2, Belton Road West, Loughborough, Leicestershire LE11 0TR. Tel: 01509 610310. Fax: 01509 610304.

STUART TURNER

GLEE '97 saw the official launch of Stuart Turner's new Isis range of aquatic pumps which combines latest pump technology with an exciting and stylish design. The complete range, including the various accessories, were on display.

The Isis range includes submersible and

surface pumps — outputs from 66gph to 4500gph and heads up to 50 feet (15m) — for a wide variety of indoor and outdoor applications.

Competitively priced and compact Isis also features low running costs and a wide selection of accessories.

Surface models are available for Koi fish and aquatic enthusiasts.

Indoor models include the Isis 66 and 110 which come as a pump only or the 110 with a fountain kit. Submersible models 170 to Isis 880 feature adjustable flow control and come as a complete boxed set with fountain kit. The larger Isis submersible pumps have outputs ranging from 1200gph to 3200gph and are supplied as pumps only, but include a pre-filter. All Isis surface pumps are available as the pump only. All pumps within the Isis range are exceptionally easy to install and come with full installation and operating instructions.

Stuart Turner is based in Henley-on-Thames and has been operating for over 90 years. The exciting new Isis range compliments their existing

The Isis range of aquatic pumps from Stuart Turner.



BUY LINES

◀ comprehensive product range and builds upon the company's established reputation as the leading pump manufacturer in the UK.

• For further details on the full range of aquatic pumps please call: STUART TURNER LTD, 47 Market Place, Henley-on-Thames Oxon RG9 2AD. Tel: 01491 572655. Fax: 01491 573704.

ROLF C. HAGEN

Decorating the aquarium or terrarium with natural logs or branches adds enormously to the overall visual effect but care should be taken to ensure that any wood used is both long-lived and safe.

Hagen's Mopani Wood for aquariums, terrariums and vivariums, is 100 per cent natural African wood that has been cleaned and sandblasted to make it perfectly safe. Mopani Wood's colouration and naturally twisted appearance will help you to create a more natural looking environment for your pets enclosure. Mopani Wood is available in three sizes, small, medium and large, but

Rolf C. Hagen's Mopani Wood for aquariums.



remember, it's a natural product and so every piece is different!

• Details from: ROLF C. HAGEN, California Drive, Whitwood Industrial Estate, Castleford, West Yorkshire WF10 5QH. Tel: 01977 556622. Fax: 01977 513465.

HOGG LABORATORIES

The 'Naturescope' is a 'mobile laboratory' for examination of the small animals of ponds, as well as insects, etc. on land, and costs £11.40, plus postage. It is a micro-aquarium (you need to fill it with seawater) of clear plastic, with magnifying lens so that the smaller animals can be seen in close-up.

It is lightweight (325 grams) with an adjustable strap so that it



Lightweight Ultra Precision Scales from Wardsworth.

can be carried around the neck by a child of school age. This means that the youngster can have both hands free when clambering over slippery rocks on the shore. When using for prolonged periods, the water should be changed so that small creatures remain alive and active.

There is a small instruction book provided, but it is not comprehensive and children would need to be told to return the rock pool creatures back to the habitats in which they were found.

• Details from: HOGG LABORATORY SUPPLIES LTD, Skoone Street, Birmingham, B1 3BW. Tel: 0121 233 1972. Fax: 0121 236 7034.

WARDSWORTH

Like a certain brand of mustard the profits from medications come from overdoing, so any method of gauging doses accurately is to be welcomed. The lightweight

Ultra Precision Scales from Wardsworth have a scale graduation of 0.1 gram as opposed to most electronic scales on general sale which provide a graduation of 1 or 2 grams. They will ensure that your pond receives the same attention to detail by weighing out the correct amount of additives or medication every time — no more guesswork.

The scales come with a useful add-and-weigh facility and are powered by a 9v battery (included) have a three year guarantee and a capacity of 200 grams. Available only by mail order at a cost of £69.99, including post and packing. Please allow up to 28 days delivery.

• The scales are available from: WARDSWORTH LTD, 67 Higher Shady Lane, Bromley Cross, Bolton BL7 9AQ. Tel/Fax: 01204-599408.



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Dear Sir,

It seems to be popular opinion nowadays that Aquarist Societies are not what they used to be with regards to membership numbers, cancelled Shows and Shows taking place on the same day.

It is the latter which I would like to pass comment on as this must lose certain Societies benching numbers and funds. This year alone dates that clashed and affected myself (and my Society) were:

Alden A.S. and Wyke A.S., 7 September 1997; Odley A.S. and NACG, 21 September 1997; Leeds A.S. and Halifax A.S., 5 October 1997; and Doncaster and Washington, 12 October 1997.

Surely such double bookings, some of which are in close proximity to each other, could be avoided.

If the relevant governing bodies such as the YAAS, FBAS and FNAS could communicate with each other and Member Societies and Affiliated members, we would all benefit.

We all have the same aims in mind — to promote the

You Write ...

hobby. So with a little more help and communication from all concerned everyone should prosper a little better.

If we don't help each other no one else will.

**Alan Holmes,
York A.S.**

EDITOR'S NOTE: Alan has put his finger on a problem that crops up year after year, although it must be appreciated that any Society putting a new (and first) Show into the Show Calendar often has to look hard for a suitable, non-competing gap — and also one that fits their choice and availability of venue.

At least one of the organisations that Alan mentions produces a quarterly list of updated Show dates (covering all

Shows, not just those of its member Societies) which is circulated to all known Societies throughout the year together with details of a Show Schedule Labelling Service. The latter provides any Society with a set of mailing address labels of nearest Societies within a feasible radius who would be likely to attend their Show.

However, like all good ideas, these services stand or fall by the support they receive. The onus is on Societies to support such schemes by providing any updated information, especially on their Show dates, as soon as it becomes available, and then Alan's last line needn't be so doom-laden as it appears.

Individuals can obtain a current list and details of the Labelling

Service by sending a SAE to Show Dates, 22 Flamsted Avenue, Wembley, Middlesex HA9 6DL.

Dear Sir,

Please permit me to say 'Thank You' to Julie Parker (Customer Services Administrator, Interpet) for her helpful cooperation over a minor equipment problem I had recently. I was extremely satisfied and grateful.

**Ron Barrow,
Halesworth,
Suffolk.**

Letters for publication in *Aquarist & Pondkeeper* should be addressed to: Letters, The Editor, MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent TN24 8ET. Alternatively you can fax directly to: 01233 632339

.. News Desk ... News Desk ..

Chinese Whispers ... A Cheerful Tale from Tetra

Mr Richmond from Leeds in Yorkshire has just sent his 11-year old Whisper pump in for servicing with the comment: "I bought my Whisper 400 pump when I started keeping fish almost 11 years ago. I get it serviced every two years and it just keeps on working."

Many fishkeepers trust the reliability of the Whisper pump range and use them to power everything from an airstone to an undergravel filter. Now manufactured in China there are eight models available in the range so you will find one suitable for your aquarium.

The pump is well named because it is Whisper quiet, incorporating an easy-clean and sound-absorbent casing, together with maintenance free mechanism that never needs oiling. The non-slip rubber base and feet prevent vibration and 'walking', whilst the Siallex-11 valves are the most robust valves available today.

For the longest lasting aquarium pump, choose from one of the following models: Whisper 100, tank lengths up to 30cm; Whisper 200, tank lengths up to 46cm; Whisper 300, tank lengths up to 60cm; Whisper 400, tank lengths up to 76cm; Whisper 500 tank lengths up to 76cm; Whisper 600, tank lengths up to 122cm; Whisper 700, tank lengths up to 122cm; Whisper 800, for tank lengths up to 183cm.

Tetra look forward to receiving

more pumps of ripe old age in the future with more delighted customers to add to their list.

Tetra can be contacted at: Tetra Information Centre, Lambert Court, Chestnut Avenue, Eastleigh, Hampshire SO5 3ZQ. Tel: 01703 620500.

Hozelock-Cyprio

Recently Hozelock Group PLC announced the formation of an enlarged Aquatics Division, Hozelock-Cyprio. The new Division, based at Hozelock's Head Office in Hodderham, is headed by Mike Pugh, General Manager Aquatics, and combines the strengths of both the Hozelock and Cyprio product ranges. Malcolm Goodson, the previous owner of Cyprio, has decided to retire from the business.

David Codling, Chief Executive, says: "We are confident that the legacy that Malcolm has left us with will be fully reflected in the new Division and that combined with Hozelock's strengths in marketing, design and new product development, the new Division can only flourish. Unfortunately, this move will result in some redundancies at our Froggall site, but most of the commercial team have transferred to the new Division, thereby minimising any disruption for our customers."

The changes became effective from October 1 1997 and full details of the integration and marketing plans for the UK market were unveiled at GLEE.

For further details, contact: Mr G. N. Walker, Commercial

Director (01844 291881) or Mr M J Pugh, General Manager Aquatics (01844 291881).

April in Paris or May in Malawi?

If you're an aquarist (and especially a cichlid fan) then the choice should be easy so why not take a look at this offer of an African aquatic adventure?

Clive Norris, who confesses that his social life revolves around cichlids, particularly Rift Valley species, and his working life as a designer and builder of lakes, large water gardens and large Public Aquaria, has a dream. His idea of the ultimate holiday is snorkelling off the shores of Lake Malawi, coupled with seeing a few other animals, you know, colourful birds, elephants, hippo, the list could go on forever, but most importantly, Malawi Cichlids.

Through extensive consultations with a company called Safari Consultants, who, incidentally, specialise in bird safaris throughout southern Africa, he has managed to come up with a package in which some of you will be more than just interested.

Designed specifically for those Cichlidophiles among you it's a 17-day safari that will include, in the first week, staying at the Livingstone Beach Hotel, on the shores of Lake Malawi, based on twin rooms and half board. Excursions may include visiting the Malleri Islands, Benje Island or Makanjila. For the water lanatics there will be snorkelling and sailing. The hotels' grounds are a botanists' delight with an amazing complement of beautifully coloured birdlife. Moving onto Liwonde National Park, you'll camp at Mvuu Safari Camp (full board) on the banks of the Shire River for several days, exploring and discovering the great diversity of animal and plant life; guides and transport will be available at all times to discover the delights of this small part of Malawi.

Then it's time to move on to Cape Maclear, Africa's first Aquatic National Park, for more snorkelling and diving, just two of the activities on offer. This attractive park (full board

accommodation) includes hills surrounding the Nankumba peninsula, which slope down to the water's edge to create sandy beaches and rocky covers. Offshore a number of small islands are also incorporated into the protected area.

The holiday is based on a minimum of eight and a maximum of 16 and is priced at £1,995 which includes flights on British Airways, all ground transfers, twin accommodation on board basis as mentioned, game viewing activities at Mvuu, travel insurances and UK airport departure taxes.

The safari is planned for May 1998, just after the rainy season (winter) and the temperatures will be extremely pleasant. If any A&P reader is interested in joining this holiday of a lifetime then contact Clive on 01453 755450, or write to Clive Norris at 5 Swifts Hill View, Uplands, Stroud, Gloucestershire GL5 1PR. The deadline for confirmation is the end of December 1997.

Steven Simpson on the Move

A&P readers who regularly obtain hard-to-find books by way of the excellent book service offered by Steven Simpson should make note of his recent change of address. It is now: Steven Simpson, Natural History Books, Rising Sun, Kelsale, Saxmundham IP17 2QY. Tel: 01728 604777. Fax: 01728 604555.

Hozelock Competition Winners

The winners of the Hozelock Competition in September's A&P were: A. G. Brown, Prestatyn, P. Clay, Souththorpe; A. Southwick, Bath; C. Thompson, Slough; Miss J. Ward, Mexborough, South Yorkshire. Each wins a Hozelock Pond Lighting Starter Set which will be despatched directly from Hozelock.

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Barry Goodwin looks at how Koi are faring in winter ponds, and says that you shouldn't worry ... cold weather is natural for them!

PHOTOGRAPHS BY THE AUTHOR

Out In The COLD



The lower temperatures are just part of the natural cycle for Koi and whilst I don't know whether or not they enjoy it, it doesn't do them any harm, either.

KOI

The author's pond during its period of over-wintering. Note the thin ice on the surface and the lack of aeration, which is turned off so as not to cool the water further.

feel guilty, sitting here in my centrally heated study at the beginning of November, pounding the warm keys

of my word processor, whilst my Koi are out in the pond, languishing at 5°C. This temperature was arrived rather rapidly over the last couple of days of extremely cold weather, for only last week the temperature was in the high fifties: I foolishly thought: "Isn't winter late this year?"

Really, I don't know why I should be feeling guilty — the lower temperatures are just part of the natural cycle for Koi and whilst I don't know whether or not they enjoy it, it doesn't do them any harm, either. That is, unless I am careless and let the temperature drop too low for their survival and well-being.

Out In The Cold

A NATURAL CYCLE

Koi belong to a class of creature known as 'poikilotherms', that is, they take their bodily temperature from that of the environment surrounding them. When the temperature cools down, their bodily temperature follows, so they don't 'feel' cold as such, rather they just become colder and their metabolism slows right down. This is perfectly natural and can progress to the point where they appear to be 'hibernating', although strictly, this is not the case. They do not 'sleep' as such when sitting on the bottom and they are always on the alert, ready

to flee should anything untoward alarm them.

LOW METABOLISM

Because their metabolic cycle has slowed right down the Koi are not eating. The drop in temperature has suppressed their digestive system: the necessary enzymes are not being produced for digestion, therefore they do not eat. This is pure instinct and not because they are cold, or feeling off colour.

The conditions under which they are living are, in fact, beneficial for them. Whilst the Koi's metabolism slows greatly the parasites which would normally be irritating passengers for them, die back to a great extent and will no longer pose a threat. This is also true for bacteria which becomes less active and will pose fewer risks than it does in summer.

The European winter is against our good intentions here, as quite simply, although it is cold enough to allow the above to happen, it also allows too much time at the colder 'intermediate' temperatures, where pathogens are not completely dormant.

WINTER

If we define winter for our Koi as the period where the water temperature is below 10°C, we can be faced with a long time indeed. This can mean a lengthy period without food for some Koi in some ponds. A Koi will digest food down to about 6°C and if you have a small pond, where the temperature could drop to this with a sharp frost overnight, you should stop feeding altogether at 10°C. However, if your pond is covered, and is a large one, the temperature will not plunge as quickly and you could feed down to a water temperature of 7.5°C. The act of covering has ensured that your Koi are not starved for too long. A lengthy period without food means that the Koi is sapping its reserves to exist, and if it does this for too long then it will enter Spring in a weakly, run-down condition, and possibly fall prey

Covering a pond can prove to be of the most benefit, but be careful that you use such measures to shorten the winter for your Koi, and not to take its place. The picture shows a cover fitted to a large pond.



Happy Koi seen swimming under a raised cover in a medium sized pond.



to disease or parasites more easily. The pathogens are always there and waiting for an opportunity, or trigger, to become active.

It is probably just as well that parasites and bacteria become less active during the coldest periods, as the immune system of the Koi is also suppressed by low temperature and, therefore, it would not be able to provide a defence against these pathogens. This is all part of Nature's cycle, and would happen whether or not the Koi was in a lake, or a pond. It is a balance struck by Nature that is mainly beneficial to the Koi, and is accepted by them. 'Accepted' is probably the wrong description here, as in reality, they have no choice, but we can certainly ease things along the way for them.

Not only is it beneficial for Koi, in terms of die-back for bacteria and parasites, but because the Koi's metabolic rate is slowed right down, it will ensure that they live a normal life span. It is fact that if Koi are not

Out In The Cold

allowed to overwinter normally, they will suffer a reduction in longevity — put simply, they will not live as long.

As Koi keepers we should all realise that as this is part of Nature's cycle we should try to interfere with it as little as possible. Our attentions should be diverted into ensuring that the Koi will not, because they are in a pond, come to any harm by conditions becoming too severe — outside those which they are designed to cope with and would experience in nature. On top of this it should be realised that Koi, in particular, are not as hardy as the Common Carp. Granted, the closer to the Common Carp the variety of Koi is, the harder it seems to be, but some of the highly-bred gosanke Koi are decidedly susceptible to anything that is passing which can be exacer-

bated by adverse conditions.

COVERING

Because a pond is a small and cramped environment, when compared to natural surroundings, the variance in temperature will be more severe. This can have a dramatic effect on Koi if we do not take care, and temperature fluctuation, combined with very low temperature, is responsible for more problems than we care to admit. For instance, in a large lake with a hard overnight frost, the shift in water temperature would be minimal; there would be no adverse reaction from the Koi as a result. In a pond it could be a different story and several degrees could be lost overnight. This will interfere with feeding instincts and other bodily functions which can't react as fast as they should to cope with the altered temperature. All temperature change should be allowed to happen slowly, and if this is not possible because of the pond size, or situation, then we should see what we can do to improve the situation.

The obvious thing to do is to cover your pond somehow, keeping out the cold winds which are responsible for rapid temperature drop. We have described this many times in the past, and so do not intend to go into the mechanics yet again; suffice it to say that covering your pond is the best method of ensuring that your Koi come through the winter unscathed.

There are more reasons for this than have already been stated, as in reality, the European winter is too cold for too long for Koi, especially those in a pond. Because of this, problems can (and do) develop that are peculiar to ponds, and being in control (!) of this aspect we can hopefully alleviate some of these.

AVOIDABLE PROBLEMS

Koi that sit on the bottom for long periods, beyond that which they would in nature, develop sores on their undersides and flanks. These are referred to as 'pond sores', not unlike the 'bed sores' that human beings can suffer with when laid up in bed during illness. These sores are usually quite large, occur when the Koi's immune system is at low ebb, will not heal in the lower temperatures, and can quickly become infected, with disastrous consequences. Covering your pond can reduce the time that your Koi will sit on the bottom, thus reducing the

Covered Koi. The picture, taken in the author's aquarium, shows a young Koi that is kept at high temperature for a year to grow on, it would not be good to keep Koi under such conditions permanently, as they would not live as long.



risk of such sores developing.

Another problem that develops is chilling of the swim bladder. It sometimes happens that a Koi, exposed to extremely low temperature, will suffer damage to this essential organ. This will mean that it can no longer control the swim bladder's inflation, and thus neutral buoyancy is adversely affected.

This can be noted by the exaggerated swimming movements the Koi is forced to make to alter its depth in the water. It must act in a similar manner to a submarine, using its pectoral fins like diving planes to rise and fall in the water. Sometimes its buoyancy is affected in that it sinks, and all its energy is expended in swimming exertions to reach the surface to feed.

Once again, covering your pond will ensure that temperatures of extremely low level will not be attained in your pond. If you do have Koi that are so affected, and this even happens with some Koi at temperatures that we would classify as 'OK', then they should be brought into indoor quarters for the winter. It is extremely unlikely that you will be successful in treating such injury.

THERMOCLINES

Having talked about low temperatures, you may be asking 'How low is low?', and the answer to that one is very difficult to answer. Obviously if freezing point is reached throughout the pond, then your Koi will die, nothing is more certain than that. You will read of thermoclines being established, during the coldest weather, in pond water. This means that the warmer water is at the bottom of the pond. I have to say that I will have to buck the establishment here, and say that whilst I fully agree this undoubtedly happens in a larger body of water, in a properly managed Koi pond it is impossible. Where the water is taken from bottom drains to the filter, and water is returned at several points around the pond, it is not feasible for a thermocline to become established. I have often issued a challenge for someone to demonstrate a thermocline in a pond, but no-one has accepted — yet.

Because of this lack of thermocline, pond temperatures must be monitored and, as an absolute minimum, lower temperatures than 2°C must not be tolerated; preferably don't let the temperature drop below 3°C.

HEATING

With a cover fitted, maintaining a

minimum temperature of 2°C or 3°C should pose no problems, but as a precaution, a small electric heater could be fitted, in a pumped return line; this could be run overnight on the Economy Seven rate if necessary. I am not recommending that you produce a sauna in your garden, just minimum heating in emergency. A good example of this is that a pond of 8,000 gallons, when covered can be built up to, and maintained, at over 10°C by a 3Kw heater. This is run for seven hours a night only and provides a much higher temperature than we are considering here.

For a smaller pond, a 1Kw heater would suffice, and this need not be run for as long. Such heating need cost as little as £5 to £10 per quarter to run — a lot less than the cost of one Koi in the pond you are protecting.

You will notice that 'over 10°C' was quoted; this is because 10°C is a very unhealthy temperature at which to maintain your pond for any extended period. There have been Koi keepers who have kept their ponds at 10°C for the whole winter, and suffered the consequences during the following Spring. The 10°C mark should be passed as quickly as possible in both an upward and downward direction. 10°C is the temperature at which the Koi's immune system becomes effective (or ineffective) depending whether or not the temperature is climbing or dropping and also the temperature at which parasites and bacteria begin to be more active. Therefore, you should not let your pond 'hang about' at this temperature for a long period. Such dalliance at 10°C can happen naturally in a pond, in March, when there are warm days and bitterly cold days. Not only will the temperature zoom up and down, creating a stressful environment for Koi, but it can maintain a mean average of about 10°C in your pond for weeks. This is the period when pathogens will attack a weakened Koi and you could lose it. Your cover will help greatly here, by protecting your pond from the wilder temperature fluctuations at this time.

PRAC-TICALITIES

Now that we have seen

the advantages a cover can bring, it is time to think about when to fit it, and how long to fit it for. As we have already established, the Koi should be allowed a period of winter, that is essential for their longevity, and for the maintenance of their biological clock.

The most sensible time to fit a cover is mid to late winter, when we have had some cold weather, but not as severe as during the later winter. A pond should be allowed to naturally winter until the end of January, letting it freeze if the weather is that cold, (but taking care of the lower limit), then fitting the cover. This will alleviate the threat posed by the coldest weather in February, and if the cover is removed in early May you will find that, because of the more conducive temperatures, the period that your Koi are without food has also been considerably shortened. During the latter half of this period, you can heat if you so desire (but don't go much above 12°C) and slowly tail this off as the outside air temperatures catch up.

By being sensible, and managing your pond in this way throughout the winter, you can make conditions a lot more amenable for the survival of your Koi, and at the same time increase the enjoyment you get from them in return.



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WE STOCK SOME OF THE BEST KOI IN THE UK

Out & About

A&P
visits
Seabray
Aquariums



It was the advent of silicone sealant which really enabled the aquarium to become part of an integrated functional piece of furniture, as once designers were freed from trying to hide metal-framed glass boxes they could expand their ideas more creatively. Another bonus, especially in the success story that is Seabray Aquariums, is that a thorough understanding of aquarium technology and practical day-to-day management is carried through each piece of furniture.

Like all good stories with a continuing happy thread it all began modestly with both halves of a partnership working together — one cleaning cut glass sheets on an ironing board, whilst the other stood by to glue the pieces together. This early endeavour (way back in the early 1960s), was a 'tank-making ser-

vice' for friends in the local Essex Fish Club which soon mushroomed into a possible business operation, which soon had a succession of much needed expanding premises — including two units (ex-chicken houses) and a unit at an ex-cement factory site where Lakeside Shopping Centre now flourishes.

Once the idea of combining furniture with aquariums was conceived very definite standards were set: everything had to be exactly right with no compromises made. A familiar slogan at the still-expanding factory is 'built to a standard, not down to a price' and Sam Bray is still a champion of principles in this respect.

Every piece of glass is quality 'float-glass' for best optical, non-distorting transparency and, naturally, it is always the correct thickness for the size of aquarium it is to be part

of. Equally, there are no risks taken in ensuring that the cabinet construction is more than capable of supporting the ever-increasing size of aquariums — the 48in (long) x 22in (high) x 15in (front to back) aquarium is now the norm, according to Catherine Bray. Add to this a fishkeeper's experience of knowing exactly how the aquarium and dedicated cabinet ought to be constructed so as to allow accommodation for external filtration systems, lighting systems and the like and you will understand why the products from the comprehensive range are so popular.

But it's not just aquariums for hobbyists anymore. Hotel furnishings now demand something out of the ordinary and many commission the company to fit specially-designed aquariums in foyers and even on several different floor levels such as



those at the Coppid Beech Hotel in Berkshire. Then, of course, there is the film work: 'Event Horizon' is a space adventure involving a Seabray concept so keep your eyes open for it. Fortunately, action films have a high demand for shark/ piranha/crocodile-infested aquariums to burst (on cue) to help or hinder the hero's battle against the bad guys, and expert advice is always on hand at Seabray. The latest triangular tank is already under construction for the celluloid screen and, as we visited, a 20ft aquarium was being installed at Wigan that very day.

Such expertise is also called for when new public aquariums are planned and the company often works with designers and architects on such unseen masterpieces as filtration systems where the all-glass filter boxes and reservoirs have to be made to precise specifications.

In the two assembly areas, everything is bustling along (if you dare bustle along with sheets of glass!); cabinet construction takes place apart from the aquarium assembly area but the two major components come together as if they had shared a side-by-side evolution all the same. Whilst some aquarium cabinets can be made by fully-automated jig systems by competitors, each Seabray cabinet is hand-built and humanly-supervised at every stage of its construction; the curved shelves must fit exactly the corresponding curves of the front glass for instance. Cabinets are not made slightly oversize to allow for discrepancies in the tank-making section! Soon,



a new multi-storey extension will streamline the process even more with materials in at the top and another fine piece of aquatic furniture — 'Much more than Good Looks' — out at the bottom.

A&P would like to thank Christine and Alan Bray for making time to show us the Seabray operation at work.

For further information, please contact the company direct at: Seabray Aquariums, Seabray House, Ridley Road, Burnt Mills, Basildon, Essex SS13 1EG. Tel: 01268 590457. Fax: 01268 590622.

FAR LEFT
Curved shelves awaiting matching with glass.

LEFT
Curved glass front.

TOP OF PAGE
Correct colour matching finishes are applied to the finished parts of the cabinet.

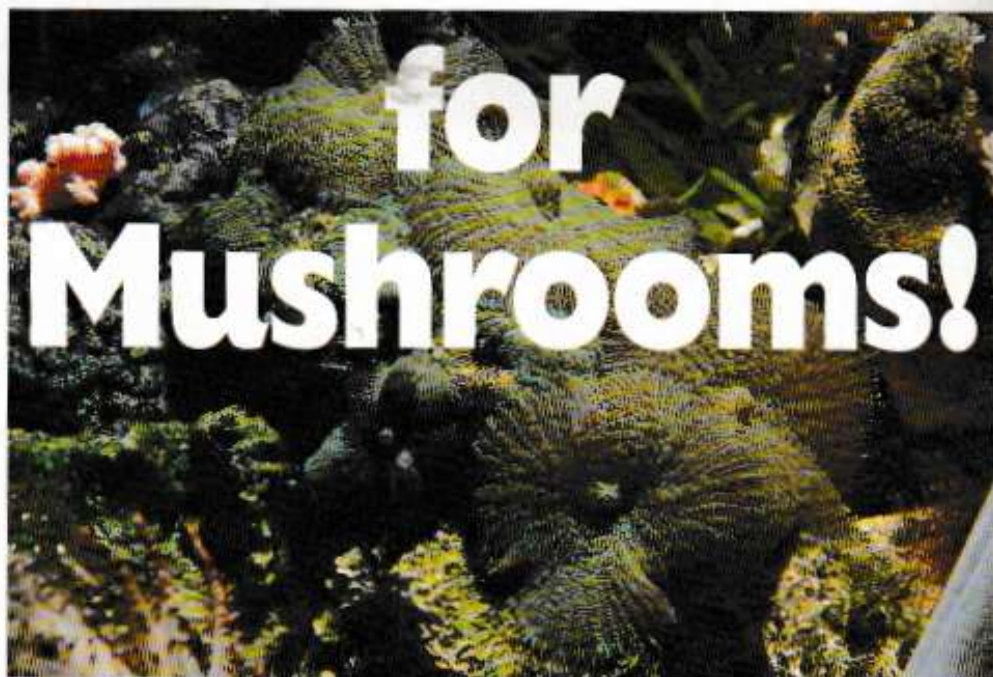
ABOVE
Terry Waller climbs into a large triangular tank to apply the final personal polishing touch.

★ See fabulous Seabray Offer exclusive to A&P readers on page 75 ★

Nick Dakin examines another group of fascinating invertebrates

PHOTOGRAPH BY THE AUTHOR

Make Room



Mushroom colony.

FAMILY: ACTINODISCIDAE

One of the problems with common names is that some families of animals tend to accrue a good selection from a variety of sources and for a number of reasons. Take the family Actinodiscidae, for example. Depending on where you are in the world, and who you are talking to, they could be referred to as Plate Anemones, Disk Anemones, Coral Anemones, Mushroom Anemones, Mushroom Polyps, or just simply Mushroom Colonies! Now, if all seems a trifle extravagant, the fact that they form a halfway house between anemones and true corals means that they earn yet another title — False Corals, which goes some way to understanding why these beautiful creatures have generated so many common titles. In truth, whatever you decide to call

them, these invertebrates are numerous in the shallow, tropical reefs of the world. Generally speaking, fierce currents and tidal surge regions are avoided, in preference to areas of calmer waters, to which they are admirably suited.

IDENTIFICATION

Whilst all mushrooms are shaped like a disc, the variety and combination of colours, textures, stripes, spots, dimples and fringing tentacles is amazing. It is little wonder that the vast majority of these fascinating animals have yet to be classified properly as they could provide work for several lifetimes! Therefore, do not be too surprised if you attempt to identify a prized specimen, only to find that it is simply referred to as *Actinodiscus* sp.

REPRODUCTION

Sessile invertebrates often adopt several reproductive strategies which give them the greatest opportunity to multiply over the largest area. Mushroom colonies are no exception and three main methods are frequently used. The first one, division, is an asexual procedure whereby an individual polyp will develop two, or more, separate mouths, to finally divide into several animals. Occasionally, these animals will remain fused together giving the appearance of one animal with several mouths.

Budding-off is an alternative means of asexual reproduction and describes a method whereby a mother polyp will bud-off one (or several) small and identical young polyps. These young animals will often remain under the shade of the

large 'mother' polyp until they are developed enough to move slowly away to become mature animals in their own right. All sessile animals must reproduce sexually if they are to spread their genes over the greatest possible area. However, it would be a rather hit and miss affair if, for instance, one related colony shed sperm during March and another produced eggs in May! To overcome this, nature has decreed that the vast majority of all sessile invertebrates should shed both eggs and sperm on a few chosen evenings throughout the year.

This wonder of nature ensures that identical species from distant locations have the greatest chance to successfully exchange genetic material. As ocean currents mix eggs and sperm, the fertilised eggs then form part of the planktonic layers of the sea to develop into larvae before migrating to a suitable reef substrate and establish their own colonies.

FEEDING

All Mushroom Corals possess symbiotic algae called zooxanthellae within their tissues. This algae provides them with a constant and reliable form of nourishment in waters that are often devoid of alternative sources. Having said that, Mushrooms are capable of feeding in a similar fashion to Anemones; that is, tiny particles are trapped on the surface of the animal and passed to a central mouth for consumption.

Larger species in the genus *Rhodactis* are capable of capturing far larger prey in a most dramatic way. Their large flat discs can transform into a hollow ball, trapping any hapless creature that happened to be resting there. Once the prey has died, it is passed into the oral cavity. As the Mushroom resumes its familiar disc shape once more, the remains of the meal are ejected from the central opening.

Marine aquarists would do well to avoid large *Rhodactis* with a diameter of 12-15in if small fish or crustaceans are kept. Gobies, Hawkfish and Mandarinfish are particularly prone to capture.

PROTECTION

Sessile invertebrates are potentially easy prey for active predators. Fortunately, Mushrooms have a defensive mechanism which is most effective at deterring fish and the encroachment of neighbouring corals. This takes the form of a toxic mucus coating which most fish find very distasteful. As this is produced on a continuous basis, the marine aquarium housing these creatures

must have activated carbon filtration to remove any toxins that have passed into the water.

COLOURS

Just why there are so many colour variations is a commonly-asked question. However, it is easily answered by considering the light requirements of each species and the optimum depths at which they are found. For the symbiotic zooxanthellae to perform their function properly, various colours are adopted enabling the algae to take full advantage of the sun's rays without becoming 'sunburnt'!

Therefore, we find shallow species producing pigments of yellow, green and turquoise, whilst deeper species are found in blues and reds.

ENEMIES

In the wild enemies are mainly deflected by the production of toxic mucus, as we have already seen.

In the aquarium the main enemies are encroaching algae and hungry crustaceans or incompatible fish; although poor water quality also plays a part. Mushrooms will demonstrate their unease in a certain situation by detaching and drifting off in an attempt to find a more favourable location.

WANDERING MUSHROOMS

The reasons why Mushrooms detach or wander from their original site are numerous and may include: loss of zooxanthellae, incorrect lighting, poor water quality, overgrowth by algae, water current that is too powerful, attack from neighbouring corals, attack from incompatible fish. Another factor that is somewhat more natural, not to say desirable, is the expansion of an overcrowded colony to form other groups in the immediate vicinity. The latter factor is one that all mariners would be pleased to observe, however, unfavourable influences must be addressed if the animals are to remain healthy.

TANK CONDITIONS

An aquarium of no less than 20 gallons net should be used; Ammonia & Nitrite: Zero; Temperature: 24-26°C (75-79°F); pH: 8.1-8.3; Nitrates: Less than 10ppm; S.G.: 1.021-1.026; Phosphates: Less than

0.5ppm; Redox Potential: 350-450mv; Efficient protein skimming and activated carbon filtration as standard; Water Changes: 15-25 per cent should be changed every two weeks with high quality water; Water Circulation: A moderate flow over the colonies is desirable; Lighting: Moderate to intense, fluorescent or metal halide.

FEEDING

Most colonies survive quite successfully without the addition of food supplements. The zooxanthellae in each polyp provides much of the nourishment required as will the juices of frozen foods introduced for the benefit of fish sharing the same tank. Large *Rhodactis* can be fed with pieces of Lancefish, Mussel, Cockle or Squid placed near the centre of the disk. Owing to their ability to easily pollute the water, liquid foods are best avoided.

MUSHROOM TIPS

Housing Mushroom colonies successfully is not always a straightforward business but here are some tips to help avoid pitfalls, or improve the display:

- (1) Position colonies so that all polyps have the opportunity to expand fully without touching other corals.
- (2) Mushroom colonies resent movement and must be disturbed as little as possible. Constant rearrangement will cause shrinking and detachment.
- (3) If colonies have to be re-positioned, allow at least a week to assess whether the move was successful or not.
- (4) Keep colonies free from nuisance algae or being overrun by decorative species.
- (5) Newly purchased colonies require at least 7-14 days in which to settle down. Avoid moving them during that period.
- (6) Detached polyps can be grouped together on the substrate in an area of slack water to produce an attractive, albeit mixed, 'colony'.

HEALTH

A number of mariners often find that their individual polyps are shrinking quite dramatically. The main causes are incorrect lighting and poor water quality. Once addressed and improved, the animals will usually restore to their original size.

Bob and Val Davies present three very popular groups of Snakes

PHOTOGRAPHS BY THE AUTHORS

Corns, Kings and

Cornsnake (E.g. *guttata*). Often the first snake for many people. Easy to keep and breed.

The Corn, King and Milk Snake groups contain some of the most popular species in the hobby today.

These three groups of snakes contain some of the most popular species in the hobby today. The Cornsnake (*Elaphe guttata guttata*), either in its normal form or as a mutation, its close relative the Great Plains ratsnake (E.g. *emoryi*) or one of the commoner Kingsnake species (*Lampropeltis* spp) are often the first snake for many keepers. Milksnakes (also genus *Lampropeltis*), because of their attractive colour combinations have grown in popularity as captive propagation has increased their numbers. They are often referred to as 'tricolors' because of their banded pattern. Kingsnakes are best known for their habit of eating other snakes including venomous species. For this reason they should be kept singly. Some species of Kingsnake also possess a ringed pattern similar to Milksnakes.

Housing

All the common species need similar care. The vivarium is a matter of choice. Some keepers use an all-glass aquarium with a custom-made lid. Although easy to clean glass loses heat quickly. Being surrounded by four transparent but impenetrable barriers may confuse some snakes for a time but they usually settle down. In this style of vivarium ventilation is via the top and may not be as effective as 'through-flow' ventilation.

A front-opening vivarium made from melamine-faced chipboard is a popular choice. All joints should be sealed with



aquarium sealant to facilitate cleaning. Ventilation panels can be provided on the front lower fascia board and at the top of the back. Ideally a glass door lock should be fitted to prevent escapes or unauthorised access. Whichever type of vivarium is used allow at least approximately one square foot (900 sq cm) floor space per foot (30cm) length of snake. Long narrow cages are not really suitable.

Heating can be supplied by a thermostatically-controlled spot lamp — preferably a dimmer type thermostat which dims the bulb instead of switching it on and off which is unnatural.

Heater mats used with a thermostat are an alternative means of heating (follow the maker's instructions regarding positioning). Some people prefer the latter method and, to ensure adequate photoperiod, also light the room. The vivarium must be large enough to provide the snake with a thermal gradient, ie, it must be cooler at one end to allow

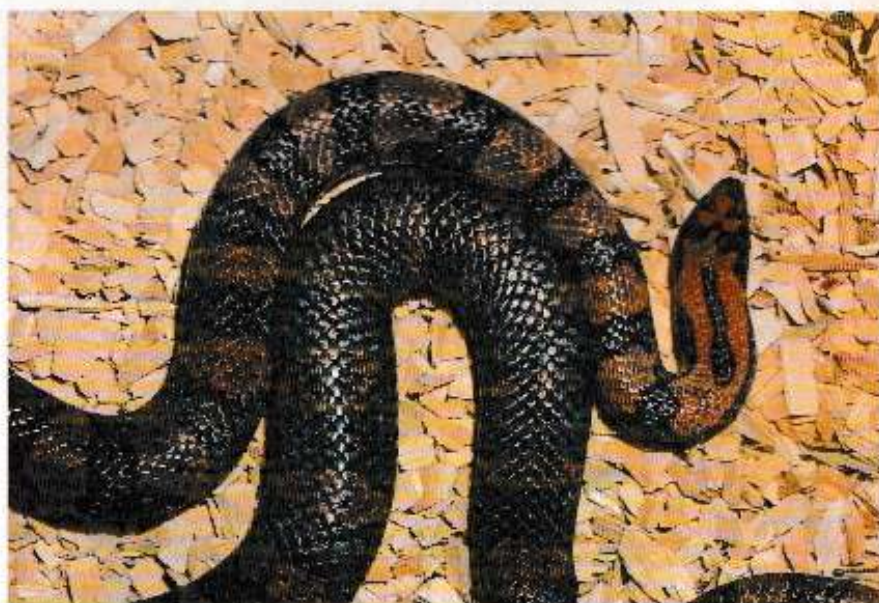
the animal to thermoregulate.

Temperatures for these species should range from 72-84°F (22-29°C) daytime falling to 66-74°F (18-24°C) at night with a photoperiod of 12 to 14 hours. A small vivarium will quickly reach a uniform temperature and the snake becomes a 'thermal prisoner' unable to regulate its body temperature. Ideally two hide boxes or other hiding places should be provided in different parts of the vivarium so that the snake can choose in which area it wishes to spend its time. Heating systems should be installed and temperatures in various parts thoroughly checked before introducing your snake(s).

Furnishing

Newspaper is commonly used as a substrate — it is cheap, easy to remove

Milks



San Luis Potosi
(*L. mexicana*).
Sometimes
classed as a
Grey-banded
Kingsnake but
suitable for a
beginner.

and disposable but not very aesthetic. Other substrates such as hardwood chips, dust-free shavings, corn cob granules, even washable carpet can be considered. Some particulate substrates may adhere to the snake's food and cause problems of impaction if ingested. However, food can be presented on a large flat stone to avoid this. Substrates of organic origin such as corn cob granules will develop mould if water is accidentally spilt on them. We have always used dust-free shavings. These are fairly absorbent which enables vivaria to be spot cleaned daily with a complete change monthly. Some snakes will climb so a branch can be supplied others may use a shelf fitted part way up the walls.

Finally, a water dish must be provided and the water changed daily. Many snakes will coil up in the dish, especially when sloughing, to avoid spillage use a deep dish with a wide base and half fill it.

Damp conditions must be avoided to



California
Kingsnake (*L. g.*
californiae).
'Aberrant' phase
— neither
banded nor
striped.

prevent skin troubles. A small plastic container with a hole cut in the lid will provide water without it spilling.

Feeding

Corns, Kings and Milks are all rodent eaters. Some specimens may show a preference for mice, others may want rat pups. Several of our females will often refuse mice after mating, but will readily eat rat pups until they have laid their eggs and then return to mice.

Corns, Kings and Milks

Dead, thawed out rodents of the appropriate size will usually be accepted. Sometimes it is necessary to simulate movement by 'twitching' the prey with forceps. Food should not be offered by hand in case the snake mistakes the hand for the prey or even a large predator.

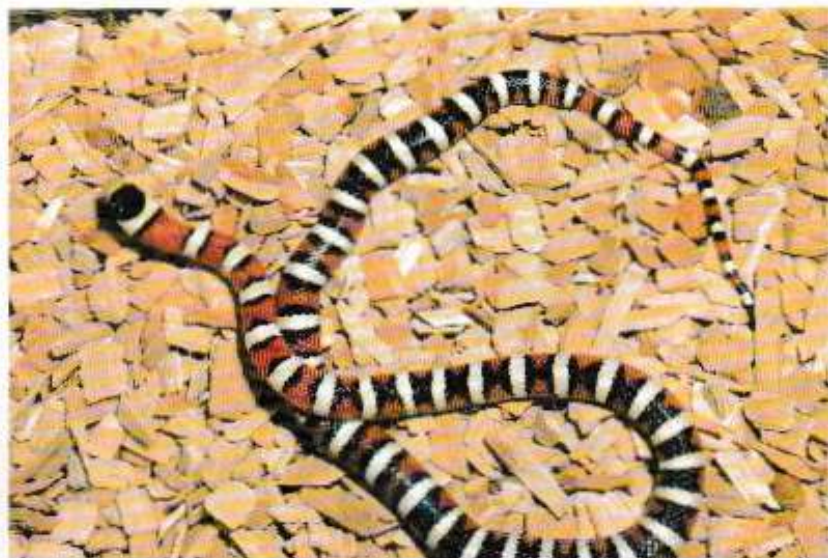
Vitamin supplements are not usually

necessary as rodents are a complete meal. The food item should be allowed to thaw out naturally. **DO NOT DEFROST IN THE MICROWAVE.** There is a thin dividing line between being thawed and starting to cook. Many snakes will refuse 'cooked' food. A record of feeding is useful particularly if veterinary treatment is needed. Remove food items which are not eaten overnight as they soon start to smell. It is important not to handle the snake for a few hours after it has fed otherwise it may regurgitate the food.

Sinaloa Milksnake
(*L.L. shalooe*).
Just hatched!



Huachuca Mountain Kingsnake (*L. pyromelano wadini*).
Young specimen — possibly one for more experienced keepers.



Breeding

Some 15 years ago, when obtaining Sinaloa Milksnakes, we were advised not to breed them before their third year (a practice we had already applied for many years with other snakes). Both Sinaloas reached large sizes (the male is 66in (165cm) long, the female slightly less), and have produced large clutches of eggs every year since, including one clutch of 18 eggs. All clutches have had a 100 per cent hatch rate with no feeding problems experienced in the young. Some books give the adult sizes of snakes, but claim that the animals will breed at half that size and age. If breeding from young, undersized specimens then small clutches tend to be laid and hatchlings may be small and present feeding problems. Don't be impatient. The female particularly may never develop her full size and potential if allowed to breed too soon.

All the listed species need cooling down for a winter period of two to three months at approximately 48-54°F (9-12°C). It does not matter if this temperature is occasionally exceeded slightly. Before cooling keep the snakes at their normal temperature for two to three weeks but withhold food. This allows the gut to empty. Some specimens start to refuse food by this time if they have adequate fat reserves stored up. Then gradually reduce temperature and photoperiod for a further two weeks. If needed a smaller vivarium with a good layer of dust-free shavings can be used.

Water is provided in a small dish and changed regularly throughout the hibernation period when the animals are checked. A hide box should also be supplied.

The hibernating quarters must be frost-free. Keep a check on temperatures. In spring the temperature and photoperiod is gradually increased. Once normal temperatures and photoperiod are reached food can be offered. Males may eat only one or two items before sloughing and then start to refuse food until they are out of breeding condition — this 'fast' can last for two or more months, however females should continue to eat. Some specimens will mate within a month of emerging from hibernation — others may take longer and need to slough first.

All our snakes are housed individually for several reasons — Kingsnakes as already mentioned will eat other snakes, also food items can be placed in each cage without worrying what will happen if two animals go for the same rodent, and finally to enable us to monitor mating. For breeding purposes we always put the male into the female's vivarium, usually on a daily basis until several matings have been observed. Kingsnakes usually seize the female's neck to hold her and the matings may last for two or more hours. Milksnake and Cornsnake males tend to lie on the female's body, pressing her neck down with their own neck. With these species we found mating lasts for a few to 15 minutes, but the specimens would mate almost daily over a two week period which ensures more fertile eggs are

produced. Kingsnakes must be separated as soon as mating is over.

If a female Kingsnake is unreceptive remove the male immediately to prevent accidents. One of our female Kings wasn't quite receptive but was very hungry and attempted to eat the head of the male.

Placing them in water finally persuaded her to release her grip. Three days later she mated successfully.

Most females continue feeding for four to five weeks and then have a pre-egg-laying slough. By this time a plastic box containing moist vermiculite and a layer of moss should have been provided.

They tend to spend more time in this and eggs are deposited 6-15 days (depending upon species) after the slough. If the vermiculite is soiled remove the eggs to a similar box. The eggs are usually in a clump — do not try to separate them. Put a perforated lid on the box. Our eggs are usually incubated in the box in which they were laid at 78-84°F (26-29°C) and hatching occurs some 55 to 65 days later.

Eggs sweat before hatching, then slits appear. Emergence may take 24 to 36 hours — do not interfere. There may be several days between first and last hatching.

Care of the Young

Hatchlings are usually kept in plastic 'sandwich' boxes with perforations for ventilation. The substrate is a layer of



Grey-banded Kingsnake (*L. altema*). Attractive species but hatchlings can be difficult to start feeding on rodents.

kitchen towel. A small water container and hide box are provided. These boxes are not cruel as long as the young snakes are not allowed to outgrow them.

The hatchlings will feel secure and find their food easily in relatively small housing.

The boxes can be either kept in a warm vivarium, or placed partially on a 'snake-strip' heater mat. Temperatures must be checked and the boxes moved on or off the mat to provide a maximum temperature of 78-80°F (26-27°C). The young are checked daily when water and substrate are changed.

Young snakes will not feed until they have sloughed — usually 6 to 10 days after hatching. Food is thawed out pink mice, wiggled if necessary. Use forceps as a 'giant' hand will intimidate the small snake. We find that most specimens will take food if it is left in the box.

DON'T be in a hurry to start forced/assisted feeding or reaching for a pinkie-pump. Hatchlings retain a certain amount of nutrition from the egg yolk and may not feed for some time. As long as they are producing faeces they are still using stored food. Pinkies can be offered every few days to see if they are ready to feed. Our Desert Kingsnake hatchlings do not usually feed for two months during which

Corns, Kings and Milks

period they slough three times. Hatching Cornsnakes have started feeding after two sloughs. In both species the young were large and plump when they hatched. As the hatchlings start growing they can be transferred to larger quarters and the size of food item increased.

CONCLUSION

Corns, Kings and Milks given appropriate conditions, are fairly easy snakes

to care for and breed.

They make excellent subjects for the beginner and the experienced alike. They have the added advantage of being relatively cheap and are easily available from retail outlets, Society Newsletters, Society 'Fairs', 'Sales Days', etc.

Having gained experience with the more common species there are a number of other species which can be considered. These need more care and experience especially in weaning hatchlings on to a diet of rodents as they would normally feed on small lizards or other snakes. These species include the Scarlet Kingsnake (*L. c. elapsoides*), Grey-banded Kingsnake (*L. alterna*), and Mountain Kingsnakes (*L. pyromalana*) various sub-species.

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SPECIES

CORNSNAKE (*Elophe guttata guttata*) also called Red Ratsnake.

COLOURATION — Usually there is a series of dorsal blotches and smaller lateral blotches with a pair of distinctive stripes on the head — one runs through the eye, the other merges to form an arrowhead. Highly variable — ground colour can be grey, brown or orange. Blotches may be reddish/orange or reddish brown, usually bordered with black. The belly has black 'chequered' marks on white/orange background.

LENGTH — 3 to 5ft (90 to 152cm).

KINGSNAKES — have a wide distribution throughout the USA and several subspecies exist. Suitable for beginners are:

California Kingsnake (*Lampropeltis getulus californica*). Available in two pattern types — banded (ringed) and striped. Captive breeding has produced an aberrant phase (a mixture of the two patterns).

COLOURATION — There are two normal colour phrases within the two pattern forms — black and white, dark brown and pale yellow (or white).

LENGTH — Up to 60in (152cm).

Florida Kingsnake (*L.g. floridana*). Distinguished from other sub-species by having up to 66 light (yellow or orangish) crossbands on a dark background. Some variation in pattern according to area.

LENGTH — 60in (152cm).

Desert Kingsnake (*L.g. splendida*). Dark brown to black background, lateral scales heavily spotted with yellow. Dorsum may have yellow spots which form crossbands.

LENGTH — 60in (152cm).

San Luis Potosi Kingsnake (*L. mexicana mexicana*). An overall mottled grey colour with a pattern of white edged black blotches or saddles which may have red centres. The top of the head usually has a forked red marking.

LENGTH — 36in (90cm).

Two other species commonly available and suitable for beginners are the **Eastern or Chain Kingsnake** (*L.g. getulus*) and the **Speckled Kingsnake** (*L.g. holbrooki*).

MILKSNAKES

Sinclairian Milksnake (*L. triangulum sinclairiae*). Red, black, white, black ringed pattern — the red rings about three times as wide as the others.

LENGTH — 40-48in (102-122cm).

Jalisco Milksnake (*L.L. arcifera*). Red, black, white, black ringed pattern. The black and white rings are about the same width. Red rings variable in width.

LENGTH — 36-42in (90-107cm).

Honduran Milksnake (*L.L. hondurensis*). Red rings twice as wide as the black, yellow, black ring combination. Some individuals lack the yellow bands. In others the yellow is obscured with red to produce a bright orange, and in the 'tangerine' morph the red and yellow bands are the same shade of deep red-orange. This species needs a hibernation temperature of 54-60°F (12-15°C).

LENGTH — 40-48in (102-122cm).

Derek Lambert reveals the techniques in increasing your stocks of this popular Cichlid

Breeding Freshwater Angelfish

Angelfish are one of the most popular of all aquarium fish which are bred in their millions by commercial fish farmers around the world, yet many aquarists think they are difficult to breed and rarely even try. My own experience with these fascinating fish started many years ago when I had only been keeping fish for just a few years. I came across a lovely marbled Angelfish in a local aquarium shop and decided to add it to my medium-sized fish community aquarium. I already knew enough about fishkeeping not to keep a large Angelfish in with small fish like Neons which it would at best bully and at worst eat!

After it had been quarantined for a couple of weeks I placed my new acquisition in its permanent home. He/she settled down perfectly well and soon won the hearts of my



whole family. After a few weeks we decided it was not fair keeping just one Angelfish by itself and set out to discover a mate for him/her. The first thing to do, however was try to decide which sex we already had! After looking in various text books I eventually discovered that by looking at an Angelfish head on you could tell the sex by looking at its body shape. Females have a distinct bulge below and behind the pectoral fins whilst males are concave in this area. Armed with this information I could clearly see that we had a lovely roed-up female Angelfish. Now came the difficult part — finding a male to go with her. A quick phone around the local shops came up with two stocking 3in plus Angels, some of which were marbles so the next Sunday we trotted round these and found ourselves a male marble. Once quarantined he joined his prospective mate in the community tank and, by pure luck,

These 'tall' Angelfish are *Pterophyllum altum* and can be recognised by their 'snouty' tipped up noses.

PHOTO: AAP LIBRARY

the two paired up and set up their own territory well out of the way of other fish.

LET NATURE TAKE ITS COURSE

Within a matter of weeks this pair spawned and tried to guard their eggs against allcomers. Not quite sure what to do next, I decided to let Nature take its course until the eggs had hatched, after which I could move the fry to another tank for rearing. Unfortunately everything went wrong and the adults ate the eggs after a day. This happened every few weeks until they finally looked after them until they hatched and I could rescue the fry.

Nowadays I do not try to breed Angelfish this way but instead I find a group of six, or even eight, youngsters to grow on. These are reared in a 36x15x12in aquarium until they pair off. At this point (depending on room) I will either sell off all but one pair or possibly keep two. You can tell when they have paired off very easily just by watching the way they behave. Two fish will take over a small area of the tank near a large plant or piece of slate. They tend to stay near each other and will chase off any other fish which comes near. Whilst at this stage they are not going to actually start breeding this is the time to remove all but one pair. If a second pair are going to be kept, these are placed in another tank of the same size by themselves.

Over the next couple of months the pairs are well fed and eventually start breeding. The spawning will

Breeding Freshwater Angelfish

usually take place in the late afternoon to early evening and it is important to make sure you leave the lights on for the next few days whilst they care for the developing eggs. On the fourth day after they have been laid they will start to hatch. At this time, they will be attached to the surface on which they have been laid by the adults. Now is the best time to remove the youngsters into a smaller rearing tank. A 24in is ideal but you can use one as small as 18in if that is all you have available.

By the eighth day the fish will be free-swimming and can be fed newly-hatched Brine Shrimp; make sure there is sufficient for all the fry. Feed them twice daily. Since some strains of Angelfish seem to produce smaller fry than others, it is also a good idea to feed some liquid fry-food as well; take care with this as it is easy to pollute the water. As soon as the fry can be seen with fat pink bellies you know they are eating the Brine Shrimp and you can discontinue the liquid food. When the fry have been free-swimming for a week you can include a gentle filter in their set-up — one of the bubble up sponge type filters are good for this. From the second week small water changes should be undertaken, but make sure the fresh water is of the same temperature and pH as that you have taken out and any chlorine, etc., has been neutralised with a water conditioner. By three months of age the fry are usually large

enough to sell on to shops or pass on to other aquarists.

An alternative to taking the fry away from the parents is to leave them in and let Nature take its course. Quite often they will eat the fry the first few times but later many pairs will rear them up for a few months. This is a remarkable sight and worth losing the first few broods so that you can watch one of the most wonderful sights an aquarist can behold.

GENES VERSUS ENVIRONMENT

An unusual fact about Angelfish is that the environment can affect the colour of a fish far more than just its genetic makeup. This fact is not widely known amongst aquarists and yet its effect can be profound. A classic example of this is seen if you raise a Silver Angelfish under continuous lighting. Instead of fish with the normal vertical black barring you will produce all-silver fish; under similar conditions a Black Lace Angelfish will become a uniform grey. Yet subjected to a four hour day a Silver Angelfish will exhibit a single black stripe or spot on the body.

Diet has long been known to affect the colour our fishes exhibit, yet in Angelfish once again the effect can be dramatic. Gold Blushing Angels will become almost pure white if they are not fed food with a high carotenoid content. More dramatic still is the effect of poor diet on young Half Black Angels. Under these conditions they fail to produce the half black pattern. When, however, they are fed a good diet later on they usually develop the full pattern unless they are sexually mature in which case they will remain patternless for the rest of their lives.

A lot of research on this subject has been undertaken by Dr Joanne Norton in America and much of this has been published in *Aquariology Master Volume*. This book was published by Tetra Press in America and is well worth obtaining if you want to take your understanding of this hobby a stage further.



See how many varieties of Angelfish you can spot in this photograph!

PHOTO: H. P. & C. PEDNOR

Back to
BASICS

The Bronze

Iggy Tavares, PhD, rates this species higher than a 'Bronze Award'

PHOTOGRAPHS BY THE AUTHOR, TAKEN WITH A PENTAX Z-20 CAMERA

The Bronze
Corydoras.

The most discernible feature of the Bronze Catfish is its metallic green head and flanks while the belly is pinkish in colour.

Popular freshwater tropicals are usually cheap and hardy. The Bronze *Corydoras* catfish is popular and hardy, but not cheap. In London, UK, they cost as much as £4, which is four to six times the price of other popular similar sized fish. They are not cheap because most fishkeepers only buy one and at most two *Corydoras* per aquarium set-up. This, in fact, doesn't do the *Corydoras* any favours because they are social animals which like to swim in shoals.

Corydoras aeneus (Gill), the Bronze Catfish, also called Aeneus Catfish, belongs to the catfish family Callichthyidae. This armoured catfish has a wide distribution in Brazil, Venezuela and Guyana where they are found in slow flowing streams.

The Bronze Catfish, which can grow to 7cm, has a club-shaped body. The most discernible feature is the metallic green head and flanks while the belly is pinkish in colour. The gill covers are also metallic green and the black eye is rimmed in green. The fins are all transparent. This catfish has a double row of overlapping bony plates on each plates on each flank. Another protec-

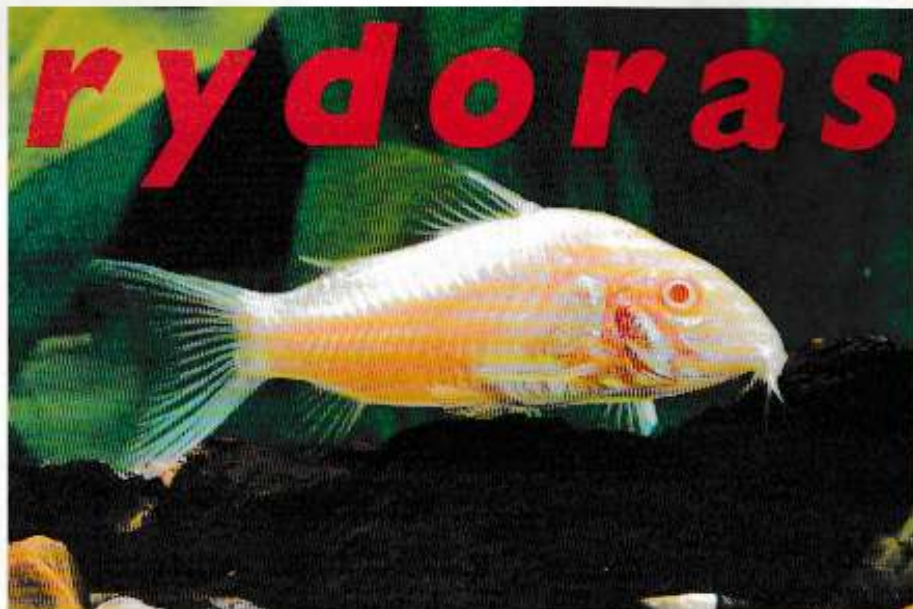


tion are sharply spiked dorsal, anal and pelvic fins. When the bronze catfish is netted it usually rigidly holds out its pelvic spines, which can get entangled in the net but could easily pierce the fishkeeper skin, so that one has to be careful during handling. The downward facing mouth has three pairs of barbels. Males and females when young look very similar, the sexes becoming discernible only in mature adults, especially as the female fills out with eggs. The Bronze Catfish like other *Corydoras* possesses a secondary intestinal res-

piratory organ, which explains why occasionally they suddenly dart up to the surface for a gulp of air. Another interesting feature is that the eyes are moveable and it is rather interesting to watch a *Corydoras* suddenly move its eyes and look downwards.

Today, many *Corydoras* species are available. A few species, such as *C. lotus*, *C. melanotaenia*, *C. semiaquilis* and *C. eques*, are similar looking to *C. aeneus*. Other commonly available species include *C. melanistius*, *C. similis* and even albino *Corys*.

Corydoras



Albino
Corydoras.



they will be seen swimming along the bottom combing the gravel looking for food tidbits. When in a shoal the Bronze Corydoras does come into its own, is much more active and is out and about even in the daytime, unlike some catfish which are nocturnal. Because the Corydoras only takes food from the bottom sufficient flake food is put into the tank to reach the bottom. My Bronze Corydoras also happily take sinking granular food.

BREEDING

Corydoras adapts to medium hard water but as it comes from the soft water regions of South America for successful breeding it does need soft water. The Bronze Corydoras, keeping to its social habits, is a group spawner and to increase one's chances it is best to use at least two females and five males. The group of mature Bronze Corydoras which should be at least a year old should be placed in a separate mature aquarium where the temperature is 80°F to start. The catfish should be well fed for two weeks, to include some live food such as small earthworms. When the females are noticeably plump the water temperature is dropped to 65°F by adding

FACT FILE

Scientific Name: *Corydoras aeneus*
Common Name: Bronze Catfish
Distribution: Venezuela, Trinidad and South America down to the River Plate
Size: 70mm

AQUARIUM CARE

Aquarium size: 36x15x12in (90x37x30cm)
Aquarium decoration: Well planted tank
Temperature: 26-28°C
Water: Soft preferred (pH 6-7.5, 2-5°DH approximately)
Diet: Flake, granular foods, some live or frozen food

AQUARIUM SET-UP

The Bronze Corydoras is usually kept in a community set-up with lots of other small gentle fish such as Tetras. However, the armour plating affords the Corydoras plenty of protection, even when kept with some of the smaller cichlids. The community tank set-up suits the catfish fine, except for the fact that it is usually kept singly. To get the most out of the Bronze Corydoras it should be kept in a shoal of four to six, when

Corydoras elegans, many species now available.

cold water. This change in water temperature occurs in their natural habitat and induces the fish to spawn. Spawning activity, which usually occurs at night, is interesting in that the female expels a few eggs at a time which she holds in her pelvic fins. After fertilisation the eggs are then plastered onto the

The Bronze Corydoras

previously cleaned, smooth surface. Over 200 amber-coloured eggs are deposited usually on the aquarium glass or other smooth surfaces. The

eggs are firmly stuck on but can be carefully removed with the aid of a razor blade. At this stage it is, however, best to remove the adults to another tank.

The eggs hatch in about two days and are free-swimming in another three-days. When they are free swimming feeding with a fine powdered food can be commenced. Like the parents the young are also bottom feeders.



CONCLUSIONS

The Bronze Corydoras is an interesting catfish usually kept singly to act as a scavenger in a community tank set-up. I would like to encourage you to keep them as a small shoal to get the best out of them. They might even spawn for you and perhaps this might bring the price of this popular catfish down a little.

Jackie's Juniors



Hi Junior fishkeepers! I have received details of lots of successful Junior activity at the recently-held Rolf C. Hagen-sponsored Supreme Festival of Fishkeeping. There were plenty of opportunities for the boys and girls to compete in all manner of activities from Fish Shows to Tugs o' War with other fun things in between.

First up was the National Junior Fishkeepers Association's Open Show at which no less than 136 fish were benched by 49 young aquarists. Many had brought their own fish but so that the other resident youngsters could join in the excitement of a Fish Show, a generous gesture by Aqua Marine ensured that they could adopt a fish for the purpose of the Show. As things turned

out the eventual top prizes went as follows: Interpet/BTC Best in Show — Angela Cank, Halton A.S. with the Highest-Pointed Junior being Robert O'Grady of Swansea A.S. who repeated his performance from last year's Festival and carried off the BTC Trophy.

In the main Hall the heats of the Junior Furnished Aquarium Race were well under way and the victors in the Final were Glow-worms from Seascale JFS who earned a place in the Adult's Final — and guess what? They beat the adult team from their own town, too!

A very happy event was the Junior Fancy Dress in which all manner of characters emerged but to everyone's surprise not one Teletubby

was to be seen. There was a few Vampires and Bats and a nasty-looking Spider but all fell to the victorious 'Flintstones' from Bracknell. Hard on their heels in second place came Little Bo Peep, created by Samantha from Seascale, whilst diminutive Tom and Ben frightened the judges into giving them third place with their version of Count Dracula and personal Bat.

Over the weekend other youngsters were painting away in the Aquarian-sponsored Junior Painting Competition and the result was a win for six-year-old Chris Jones from Yarton in Bristol. Dr David Ford explained that whilst there were no separate age categories this year, age (and effort) was taken into

consideration when evaluating the paintings. Second place went to nine-year-old Louise Pannell from Hastings with 13-year-old Yvonne Garbutt from Leeds taking third place.

There was a serious side of things to be sorted out, too, with the Tetra-sponsored National Junior Fishkeepers Association Quiz. Here the six finalists faced some stiff questioning from Roger Foggitt who wasn't pulling any punches. We've come to learn that if there's one thing youngsters dislike more than anything else it's being talked down to or being patronised.

After a tense battle the Quiz Champion emerged in the shape of Matthew Fiddes, an independent young

FABULOUS SEABRAY AQUARIUM COMPETITION FOR READERS OF A&P

You can win a superb 'New Design' Dolphin Aquarium and Cabinet (pictured right) from Seabray in this easy to enter competition. The 39in aquarium is housed in a hand-built quality cabinet which has two doors beneath allowing access to spacious cupboards. The new cut-out plinth fascias make for elegant appearance (and less imprinting of the carpet!). The colour of the high quality veneer is left for you to decide (Oak, Dark Oak, Black Ash, teak, Cherry and Mahogany), or you can even ask Seabray to colour-match it to your existing furniture if necessary.

All you have to do is to answer the following questions (clues to the answers can be found in the separate 'OUT & ABOUT' feature on the company, pages 60-61).

- 1 When did the Seabray tank building service start?
- 2 Name the Shopping Centre built over a previous Seabray site.
- 3 What is the latest cinematic appearance called in which Seabray plays a part?



Send your answers and your name and address on a postcard (or sealed-down envelope), to: Seabray Competition (AP12), Coxton House, Wellesley Road, Ashford, Kent TN24 8ET, to arrive no later than January 23 1998. The first correct entry to be drawn will win the Seabray Aquarium and Cabinet. Collection arrangements must be made by the winner through the nearest Seabray stockist.

aquarist who has attended most of the Festivals in past years. Whilst there can only be one winner Roger Foggitt praised the determination and interest of the other finalists, Richard Lawn, Ruth Price, Clare Louise Iawn, Angela Cank and Elizabeth Porter who will surely be hotly contesting next year's Quiz Final.

The 'Grand Finale' of the weekend had to be the traditional, ever-popular Tug o' War Heats and Final which was judiciously supervised by Geoff Copes, Hagen's strong-but-gentle Budgie expert. Standing no nonsense, but allowing the youngsters to have their own few minutes of very noisy fame, Geoff masterminded the heats with equally-biassed favouritism but in the end there was no doubt of the winners, the appropriately-named 'Simply the Best' who beat their Seascale compatriots 'Seascale Predators' into second place.

BELOW Best in Show Angela Cank (Halton A.S.) with FBAS President Jack Sillwell and Amanda Smethurst of Hagen.

RIGHT Junior exhibitors — winners all

BELOW RIGHT Junior Fancy Dress winners 'The Flintstones' from Brocknell A.S.



Remember, those lovely people at John Allan Aquariums are giving a prize for the best received — SO DON'T DELAY — DO IT TODAY! Please write to: Jackie's Juniors, c/o A&P, Mj Publications Ltd, Coxton House, Wellesley Road, Ashford, Kent TN24 8ET

Out & About

The British Aquarists Festival 1997



The A&P stand and Champion of Champions display at BAF 1997.

NORA GREEN reports:

Changing venues is always a worrying situation but as this year's event was held at the George Carnall Leisure Centre, Urmston, Manchester, just a mile or two from the previous year's venue, we did not feel that our 'regulars' would have any difficulty in relocating.

First appearances are important, and the Hall being much smaller than the previous location, I think gave a more cosy, friendly atmosphere. It made it a lot easier for friends who only meet at these Festivals to find each other for a start. Also available, was a professionally-run, free creche, a great idea allowing parents to dump their children while they enjoyed the Show; not to mention saving a few heart-stopping moments when you see some youngster, having escaped their parent's clutches, charging towards the tanks! The cafe

also deserves a special mention, where else would you get a massive bacon barm cake for £1.10? Enough to keep you fuelled for the rest of the day.

Once again *Aquarist and Pond-keeper* sponsored both Tropical and Coldwater Finals of the Champion of Champions.

Looking around the six 'Wet Fish' stalls there was a good variety of fish on sale, from the cheaper community fish to the specialised, more expensive, fish as well as some unusual Barbs, Catfish and Rasboras from India; elsewhere there were some Coldwater fish not normally on 'open sale'. Whether or not there were any really rare fish on sale I wouldn't know, mainly because I couldn't find any with a label stuck on their heads saying: "I am rare".

The Habitat Section, won by Brian Walsh from Darwen A.S., had eight excellent set ups, whilst the Furnished Aquarium Section (also won by Darwen) included 20 tanks of

Cichlid, Coldwater and Marines. An excellent idea, enabling the general public to see just how nice the tank in their living room could look with a bit of time and practice. There was always, throughout the two days of the Show, quite a lot of interest in this section and, hopefully, some will have gone home with the idea they could do that, even though the majority looked very professional, as we have come to expect from Clubs like Darwen and Alden. However, there was one tank that stood out from the rest, unfortunately, the person (which modesty forbids me to name) didn't quite understand, until it was pointed out to her on the Sunday afternoon, what 'furnished aquarium' meant — therefore her's ended up as a sort of cross between furnished and habitat for want of a better description!

Although some of the old traders were missing many new ones were present, with the usual bargains available, ranging from small, inexpensive pieces of bogwood or fish food, to high tech, control systems. In short, with the vast variety of tanks, equipment and plants, this show was an ideal place to purchase, relatively inexpensively, a full set-up.

The best feature of the Show as always and what, I at least, have come to expect from the British Aquarist Festival, was the amount of advice available. With so many experts like Ben Helm from the Brooksby College, Dr David Ford with the Aquarian Advisory Service, FAITAG members Justin Bell, Dr Peter Burgess, Ivan Dibble and John Jarvis, plus the Hagen Helpline staff on hand throughout the weekend to answer any queries, be they fish health, feeding, conservation or equipment issues. The amount of knowledge, assuming unlike me, you are able to accumulate, from talking to these people is fantastic. Being

the nosy so and so that I am I stood around eavesdropping to some of the discussions taking place and they covered every imaginable fish subject.

Northern Goldfish and Pondkeepers Society created a landscaped garden pond displaying some magnificent fish where you could either sit around on the garden furniture to watch, or get advice from the experts.

On the showing side the Champion of Champions, again sponsored by *Aquarist and Pondkeeper*, was Tropical, Mr and Mrs Tyson, with *Leporocanthicus galaxias*; Coldwater winner was Alan Ratcliffe with a London Shubunkin; Best in Show went to M. Mackay from Halton A.S.; Best Coldwater to Mrs. B. Colley, Oldham A.S.; whilst the exhibitors with the most points were Mr and Mrs P. Jones, Cast 88. The FNAS Show League was won by Halton with 694 points and A. Cank, Halton, won the Junior Show League. The FNAS Breeders' Scheme saw I. and Y. Cank receiving their Master Breeders' Diploma as well as having the highest-pointed Breeding Pair.

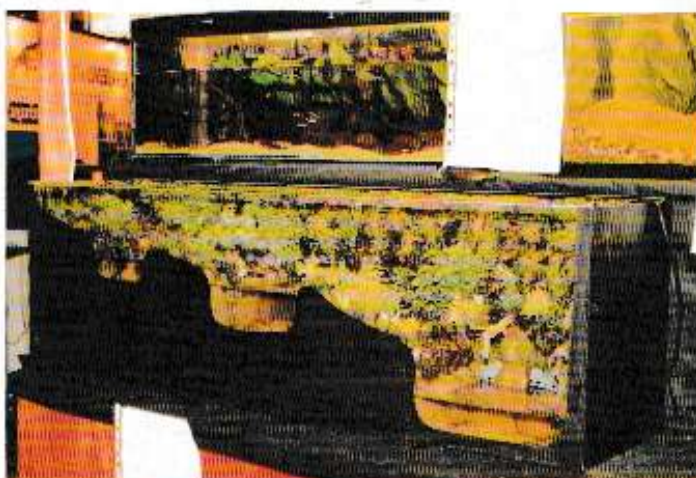
Alden A. S. (as is becoming the norm) won the Best Tableaux with their beautiful Christmas House, closely followed by Darwen and Bradford, all three Tableaux showing that a lot of hard work had gone into producing them and they rightly deserved the acclaim they received.

Dr David Ford again hosted the Aquarian Aquachamp Final and of the six finalist taking part Alan Race of W.A S.F. was the outright winner, answering every question correctly (which, according to Dr Ford, were 'toughies').

Although the main theme of the Festival is competitive, fish people in general are the most helpful, friendly people in the world and in spite of all the hard work that

goes into putting on a Show of this magnitude on the two days of the Show it is the fishkeepers and public that make it the Show we've become accustomed to. From

Shows such as this the F.N.A.S. hope to encourage people, not only to take up the hobby, but to learn and do it properly, whether we keep fish for showing or decorating the living room, the welfare of those fish should be our first priority. The British Aquarist Festival, I think, did the job superbly.



MAIN RESULTS

Champion of Champions

Tropical: 1st A. Tyson, Bracknell A.S.; 2nd and 3rd S. and T. Derrick, Halton A.S.

Coldwater: 1st A. Ratcliffe, NGPS; 2nd S. Moore, NGPS; 3rd J. Rees, NGPS.

Best Fish in Show: Stan Taylor Trophy and Best Tropical Fish, G. W. Cooke; Memorial Trophy, M. Mackay, Halton A.S. (AOV Catfish).

Best Coldwater Fish: Belle Vue Challenge Trophy Mrs B. Colley, Oldham A.S. (Moors & Veitails).

Society Furnished Aquarium: Alden A.S.

Individual Furnished Aquarium: A. and D. White, Alden A.S.

Aquascope Furnished: I. Haworth, Darwen A.S.

Highest Pointed Breeding Team: I. and Y. Cank, Halton A.S.

Exhibitor Gaining Most Awards: Mr and Mrs P. Jones, CAST 88.

Society Tableaux: 'Harry Penhal Memorial Trophy', 1st Alden A.S.; 2nd Darwen A.S.; 3rd Bradford A.S.; 4th CAST 88; 5th Oldham A.S.

Habitat Class: 1st and 3rd Mr and Mrs B. Walsh, Darwen A.S.; 2nd B. Drake, Darwen A.S.

Young Artist of the Year: 5-7 years, 1st Mark Killinail, Limeside School; 2nd Gemma Kerstow, Limeside School; 3rd Paula Black, Limeside School. 8-11 years, 1st Donna Buckley, Limeside School; 2nd Austin Durose, Limeside School; 3rd Mark Iatton, Limeside School.

Handicrafts: 1st G. M. Williams, CAST 88; 2nd and 3rd J. Lawn, Silk Town A.S.

TOP
This clever 'cutaway' shows detail in Habitat Class.

MIDDLE
Tony Tyson of Bracknell A.S. Champion of Champions (Tropical) winner.

BOTTOM
Alan Ratcliffe of Northern Goldfish & Pondkeepers Society Champion of Champions (Coldwater) winner.

The Scottish Aquarists International Fishkeeping Festival

The SAIF (Scottish Aquarist Festival) has come a long way since it ended its annual show at Motherwell. Now it is run jointly by the USA (Union of Scottish Aquarists) and the FSAS (Federation of Scottish Aquarist Societies) and incorporates the Scottish Supreme Champion, the International Champion and Best in Class Awards. The SAIF Scottish Champion is now three awards too: Scottish Supreme Tropical, Scottish Supreme Coldwater and new for 1997, the Scottish Supreme Junior.

After moving around the Scottish Clubs for the past three years the SAIFF has settled in ... Butlins! The Open Show was held in the Butlins Ballroom in Wonderwest World at Ayr. Most

of the guests paid to spend the weekend at Butlins with board and meals at the Holiday Centre from Friday evening, 3 October

to Monday morning, 6 October.

The Open Show was held on the Sunday and visitors needed to pay the Butlins day rate of

£10 to enter their fish. However, all the camp's facilities were available during the judging by the panels of Scottish and international (which means English!) judges.

Judged a great success by those who booked into the camp for the weekend, there was some criticism by Open-day visitors who overlooked the Butlins entry fee. Another factor was that the Fish Show was not advertised by Butlins themselves, so most of the thousands of holiday guests in the camp for the week missed seeing over 240 fish entries and displays by the only two manufacturers supporting the Show — Aquarian and Hagen. The FSAS and USA committee are now looking into these problems and an announcement about SAIFF '98 is expected soon.

Results

Scottish Supreme Champion Tropical was won by S. and T. Derrick with their *Panaque nigrolineatus*.

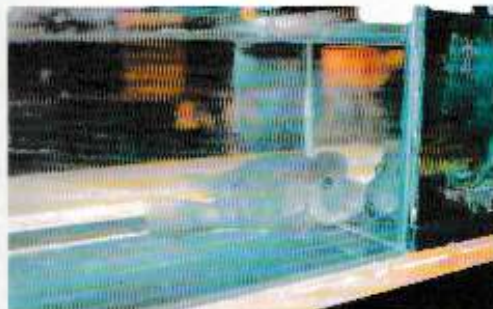
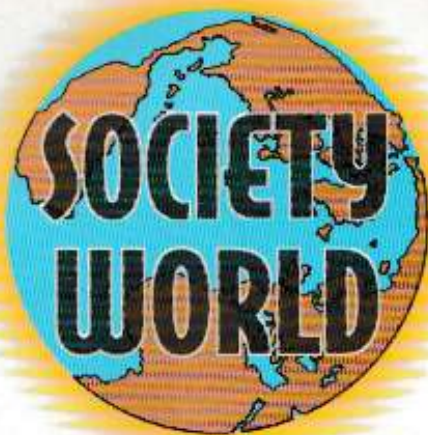
Scottish Supreme Coldwater was also won by S. and T. Derrick with a *Cyprinella (Notropis) lutrensis*.

Scottish Supreme Junior was won by Paul Stenhouse with his *Steatocranus casuaricus*.

The International Tropical Winner was R. and K. Kirkup with *Peckoltia platyrhynch*.

International Coldwater Winner was Mr and Mrs Silk with a Calico Fantail Goldfish.

Open Show awards were: Best Pair, G. Mackay; Best Breeder, D. Wyper; Best Livebearer, J. Arkley; Best Egglayer, R. and K. Kirkup; Best Junior, R. McCafferty.



The Scottish Aquarists International Fishkeeping Festival PHOTO CALL



FAR LEFT Winner of the new Scottish Supreme Junior Championship is Paul Robert Stenhouse of the Kirkcaldy A.S., seen here receiving his Aquarian Junior's Cup from Mrs Dorothy Ford of the Aquarian Advisory Service.

ABOVE The winner of the new for 1997 Scottish Supreme Junior Champion award — a magnificent *Steatocranus casuaricus*.

LEFT Judging under way under the chandeliers! The Open Show exhibits in a Butlins ballroom.

WYMAG Symposium '97

This year the West Yorkshire Marine Aquarist Group's symposium was held at Leicester ▶

University's Gilbert Murray Hall on Sunday, 12 October.

Supported by Underworld Products the speakers were from Monaco, Germany and the USA. An audience of 180 mariners were treated to lectures and videos on the aquarology of captive marine systems.

Dr Dieter Broekman, the science writer for German and American magazines, compared the chemistry of the Calcium chloride/Sodium bicarbonate system with Kalkwasser (saturated lime) and a limestone reactor. The effects on pH, Calcium and phosphate contents were discussed, the final recommendation being that a combination of adding lime plus using a reactor was the best way of maintaining stable marine chemistry.

Peter Giles is the Assistant Curator at the Musée Océanographique de Monaco and he showed a fascinating video of their work behind the scenes at the aquarium. This included farming hard corals and cementing the baby growths into the public aquaria.

Martin Moe from the USA is famous for his books on breeding marine fish in captivity and he let all the WYMAG members into his secrets with a talk-over video and slides. His method of raising plankton on V8 (a USA vegetable drink) was obviously successful and much easier than growing marine algae.

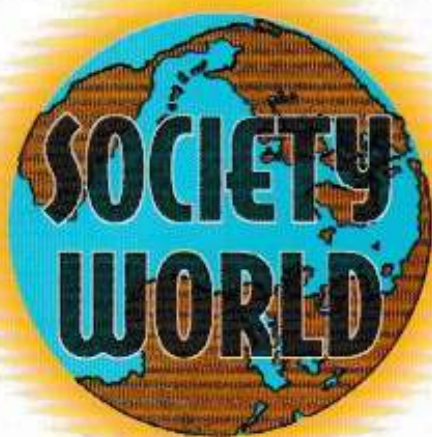
Solway A.S. Open Show

By a mere two points the host Society, Solway, retained the Lismanis Trophy for the Best Pointed Society with Scotland's largest Society, Greenock, in second place, Workington third and Dundee fourth. Over 500 entries from 52 of Britain's top exhibitors were on the bench, making the collection of awards for everyone very difficult.

Mount Sydney Inn Trophy for Best Fish on Show went to Rob and Karen Kirkup from Washington (W.A.S.P.) with their *Polypterus ornatipinnis*. Best Pair on Show, Gavin Cowan of Solway A.S. Best Breeder in Show, Malcolm Bryson from Livingston A.S.

MAJOR AWARD WINNERS WERE:

RAC Trophies: Guppies, Phil Holden, Preston; Large Cichlids,



D Wilson & T Ridley, Workington; Tropical Minnows, T. and A. Cannon, Workington BNFL Trophies were awarded to the following: Cultivated Livebearers, T. and A. Cannon, Workington; Wild Species Livebearer, Berbs, N. and D. Lynch, Newcastle; Aquatic Art, Gavin Cowan, Solway; Best Junior Exhibitor Coldwater, Lisa Steel, Solway; Breeders' Egglayers, M. M. Bryson, Livingston; Murray Aquatics Trophies, Angelfish, Keith Liddle, Killilish, B. Grant, Paisley; Best Junior Exhibitor, Livebearer, T. McCartney, Greenock; Nitrosdale Clearing Trophies, AOV Livebearer, Pam and Ray, F.I.E.A.S.; Small Cichlids, B. O'Neil, Workington; Cannon Cinemas Trophy (Characins), Keith Liddle, Dundee; C. Ross Trophy (Large Characins), Keith Liddle, Dundee; Solway A.S. Trophy (R.V. Cichlids), Keith Liddle, Dundee; RAC Trophy (Corydoras), Keith Liddle, Dundee; P. Mukic Trophy (Large Anabantids), Keith Liddle, Dundee; B & R Aquatics Trophy (Loaches/Botias), Keith Liddle, Dundee; D. Brunton Trophy (Rasboras), T. and A. Cannon, Workington; D. Bell Trophy (Synodontis), T. and A. Cannon, Workington; G. Cowan Trophy (Rainbows), G. Cowan, Solway; K. Taylor Trophy (Small Catfish), G. Cowan, Solway; RAC Trophy (Livebearer Pairs), G. Cowan, Solway; Lormac Trophy (Danos), G. Cowan, Solway; P. Heinrich Trophy (Large Catfish), Rob and Karen Kirkup, Washington; Ial Studios Trophy (AOB Egglayer), Rob and Karen

Kirkup, Washington; J. Buchan Trophy (Fighters), N. and D. Lynch, Newcastle; Beaumont Park Trophy (Small Anabantids/Colias), D. Wyper, Greenock; JWB Taylor Trophy, B. and S. Chish, Doncaster; C. Gillan Trophy (Egglayer pairs), G. Mackay, South Scotland; T. and F. Dyer Trophy (Albino), M. Bryson, Livingston; Border Cars Mazda Trophy (Coldwater), D. McCartney, Greenock; Gates Rubber Co Trophy (Best Junior Exhibitor Egglayer), R. McCafferty, Greenock; J and BH Sandhu Trophy (Breeders Egglayers), M. Bryson, Livingston.

Solway Society wish to thank everyone for support given in sponsorship, without which it would be impossible to promote the Open Show.

North East Federation of Aquarist Societies

N.E.F.A.S. wish to inform all fishkeepers of their forthcoming one day Open International Fish Show, on Sunday, 8 March 1998.

The Show will take the normal agenda of an Open Fish Show, complete with an Auction of Surplus Fish and Fish Items. We would like to invite ALL fishkeepers to attend and enjoy a great day out.

Further details from John Chapman on 01325 354815.

DIARY DATES

DECEMBER
7 Gloucestershire A.S.
Bill & Gavel, Cattle
Market, St Oswalds Road,
Gloucester. Quiz and
Christmas Buffet. Contact
Andy, 01452 372918, or
Christine, 01242 520428

OPEN SHOWS

Rd = Road; A = A of A;
FB = FBAS; IN = INAS;
IS = ISAB; I = International
Goldfish Standard; N = NFFAC
U = USA; Y = YAAS

1998
8 March NEFAS Open
Shows
21/22 March Yorkshire
Aquatics Festival,
Doncaster
30/31 May Fishworld
98, Dumfries
28 June York & D.A.S.
(Y)

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