

The Author of this management guideline is looking for anyone who may be interested in taking on & updating this document as required. Any person interested in this task please e-mail avianrearing@googlemail.com for further details.

Management of

PEKIN ROBINS

and

SILVER-EARED MESIAS

In Captivity

DAVE COLES

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INTRODUCTION

This is the second booklet covering a single genus of birds produced by the author. The first, on laughingthrushes, was well received by keepers and it was at the suggestion of one of these that I decided to research the present volume covering the two species that comprise the genus *Leiothrix*. Pekin Robins and Silver-eared Mesias are popular cage-birds and much general information is available but widely dispersed amongst avicultural literature. The purpose of this booklet is to bring this information, along with the results of a questionnaire returned by over twenty keepers and breeders, into one volume that will cover most aspects of the captive management of *Leiothrix* in some detail.

Most of the information relates to Pekin Robins but a great part of it is equally applicable to Mesias. Where information between the species is known to differ significantly this is mentioned. It is the intention to cover all aspects of management that will hopefully provide the information needed to be successful with this genus.

Experienced keepers may find some of the information rather obvious but people new to softbills from other branches of aviculture should find it helpful. Whether keepers are experienced or not, information is likely to be available that is not covered by this book. Consequently, if you are aware of items not included, please do consider sharing such by contacting the author by post or e-mail so that the new information can be made more generally known.

Pekin Robins, in particular, are a great favourite of mine as they were the first softbill I kept as a 12 year old and, much later, provided the highlight of a trip my wife and I made to Nepal. The sight of a flock of Pekins flitting through the trees against a backdrop of the Himalayas was spectacular.

Other titles will hopefully be added in the future and while some information will overlap on certain aspects of management, as it does between laughingthrushes and the subjects of the present volume, it will be unlikely that all keepers will want to keep all of the groups ultimately covered. Likewise, there should be no need to search for details such as culturing suitable livefood. This booklet covers the subject as fully as I am able to make it. I have always tried to keep new details on file so that information can be up-dated periodically. This has been achieved successfully over many years with the First Breeding Records for Birds Bred in the UK.

With the simultaneous publication of this booklet and one covering GROWING AND COLLECTING WILD AND CULTIVATED GREENFOOD AND SEEDS, plus the recently revised and up-dated BREEDING RECORDS, details and up-dates of all my booklets are now available on the internet or by post on receipt of a fifty pence stamp.

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CLASSIFICATION

Until quite recently babblers were placed in the large family Muscicapidae which also included thrushes, warblers, parrotbills, fairywrens, flycatchers, monarch flycatcher and whistlers. Since the publication of Monroe and Sibley (1993) when birds were then classified using DNA there have been major changes. *Leiothrix* still retain their place within the Timalini along with other common avicultural subjects the babblers, fulvettas and yuhinas. The list below is the breakdown of the classification of the Sylviidae to which *Leiothrix* now belong. Numbers relate to genera/species in each component. Subspecies follow Howard and Moore (1984).

Family Sylviidae	101/560
Subfamily Acrocephalinae (Leaf-Warblers)	36/223
Subfamily Megalurinae (Grass-Warblers)	10/22
Subfamily Garrulacinae (Laughingthrushes)	2/54
Subfamily Sylvinae	53/261
Tribe Timaliini (Babblers and <i>Rhabdornis</i>)	51/236
Tribe Chamaeini (Wrentit)	1/1
Tribe Sylviini (<i>Sylvia</i> Warblers)	1/24

THE GENUS *LEIOTHRIX*

The generic name *Mesia* has been used for *argentarius* whilst *Leiothrix* and *Liothrix* has been used for both, especially in older literature.

The subspecies of each is given as listed in Howard and Moore. There is some variation between these and both the labelled skins at the British Museum in Tring and subspecies listed in Peters. Because of this, and the paucity of some subspecies in the collection, corpses should be offered to the museum for their skin collection.

Legend

- ° Subspecies believed indistinct from that bracketed.
- * Subspecies in Tring collection.
- ¹ Not listed in Howard and Moore. Validity in doubt owing to Type specimen originating from a captive bird found in a Marseilles market and named by Delacour. The bird in the collection at Tring is small by comparison to other subspecies, both in body size and wing length.
- ² Bracketed name is as labelled at Tring.

PEKIN ROBIN

Other names: Red-billed *Leiothrix*, Red-billed *Leiothrix*, Red-billed *Liothrix*, Pekin Nightingale, Japanese Nightingale, Hill Robin, Peking Robin, Peking Nightingale, Doubtful *Leiothrix*, Yellow-billed *Liothrix*, Yellow-throated *Liothrix*.

Subspecies and Distribution

*Leiothrix lutea kumaiensis**

W Himalayas

<i>Leiothrix lutea calipyga</i> *	E Himalayas
<i>Leiothrix lutea luteola (calipyga)</i> °	SW Myanmar, S Assam
<i>Leiothrix lutea yunnanensis</i> *	NE Myanmar, NW Yunnan, SE Sikang
<i>Leiothrix lutea kwangtungensis</i>	S China, NE Vietnam
<i>Leiothrix lutea lutea</i> *	SE & C China
<i>Leiothrix lutea astleyi</i> * ¹	?

Introduced to the Hawaiian Islands (Kauai) in 1918. Now established and common on Molokai, Maui and Hawaii; formerly common but now rare on Kauai and Oahu (A.O.U.).

Description: Dark grey moustache. Yellow throat and yellow-orange breast. Rest of underparts olive-grey with black tip to tail. Bill red. Primaries yellow (see key to subspecies and sexing).

Key to subspecies

Red edge of primaries reduced or absent. Pale underneath.....	<i>kumaiensis</i>
Inner primaries conspicuously edged with red.....	<i>calipyga</i>
Primary coverts orange. Broad breast band dark orange-brown.....	<i>yunnanensis</i>
Narrow dark orange-brown breast band. Dark chestnut on coverts.....	<i>lutea</i>
Smallest race. Much duller.....	<i>astleyi</i>

Imported subspecies: Most likely to be *calipyga* and *kumaiensis*. Very little is known about *astleyi* and the Natural History Museum, Tring should be consulted if small Pekins become available.

SILVER-EARED MESIA

Other names: Silver-eared Leiothrix, Silver-eared Liothrix.

Subspecies and Distribution

<i>Leiothrix argenteauris argenteauris</i> *	Himalayas, N Assam
<i>Leiothrix argenteauris vernayi</i> *	S Assam, Myanmar, W Yunnan
<i>Leiothrix argenteauris galbana (aureigularis)</i> * ^{o2}	E Myanmar, N Thailand
<i>Leiothrix argenteauris ricketti (rubrogularis)</i> * ^{o2}	SE Yunnan, N Indochina
<i>Leiothrix argenteauris cunhaci</i> *	S Indochina
<i>Leiothrix argenteauris tahanensis</i> *	S Thailand, N Malaya
<i>Leiothrix argenteauris rookmakeri</i>	NW Sumatra
<i>Leiothrix argenteauris laurinae</i> *	W Sumatra

Description: Black head with silver ear coverts. Orange-yellow throat and lower breast. Rest of underparts blue-grey as are upper parts. Primaries yellow fringed with varying amounts of red. Tail coverts red in male, orange buff in female (see key to sexing).

Key to subspecies

Nape pale orange and less extensive than <i>galbanus</i> ; palest race.....	<i>argenteauris</i>
---	---------------------

Lower nape lacks an orange wash.....	<i>vernayi</i>
Nape deep orange and more extensive than <i>argenteauris</i>	<i>galbana</i>
Throat dark orange-red	<i>rubrogularis</i>
Forehead with pronounced orange feathering	<i>cunhaci</i>
Throat light orange	<i>tahanensis</i>
Overall a more orange appearance.....	<i>laurinae</i>

Imported subspecies: At least two in recent times; *argenteauris* and *laurinae*. The latter inhabits Sumatra as does *rookmakeri*. However, *rookmakeri* is known only from the Type specimen, and it would be beneficial if any losses occurred with *laurinae* to submit them to the Natural History Museum at Tring for further investigation.

ACCOMMODATION

TYPE OF ACCOMMODATION

Leiothrix are active birds. They should only be kept in cages for brief periods of time. Once assessed as to their general health, newly acquired birds will benefit greatly from release into an outside enclosure, providing adequate shelter is available and ensuring that the weather is settled and warm. Even birds in poor feather will welcome the opportunity to experience a bit of fresh air. Only in times of ill health or if fighting occur should they be confined to small cages, and then for as brief a period as possible.

Practically all respondents to the questionnaire gave their birds access to an outside flight with some form of shelter attached. Tomlins (pers. comm.) keeps his birds in a large shed measuring 5 m x 2.5 m all year round with artificial light, removable panels and potted shrubs. These birds are also ideal subjects for tropical houses where quite a bit of success has been achieved, but little information noted. A tropical house is an ideal and potentially productive environment but these notes are intended for the hobbyist to maximise success by means that are more applicable to the majority of keepers.

With Mesias, housing them indoors for any length of time away from ultra-violet light may effect the colour intensity of plumage, especially if coupled with a restricted diet.

AVIARY CONSTRUCTION MATERIALS

There are no special requirements in the way of construction materials needed. For *Leiothrix* wooden-framed aviaries are adequate with 1" x ½" or ½" x ½" welded mesh or wire netting as a covering. This sized mesh also has the advantage of making the aviary fairly vermin proof, although mice can still seem to find there way in. A regular, careful check of wire adjacent to thoroughfares, where people carry equipment, is a necessity; a snick in small meshed wire, although not large enough for birds to escape through, may be large enough for a weasel to enter. Once a weasel has entered an aviary it is unlikely many small birds will survive the first foray of these efficient hunters.

DIMENSIONS

For both Pekins and Mesias relatively small aviaries can be used but they need to be comparatively well planted if anything other than survival is to be attempted. The smallest flights noted in the questionnaire were 2 m x 1 m x 2 m and 1.75 m x 1.2 m x 2 m. At this size, other occupants would need to be kept to an absolute minimum with no competing species. At the other end of the scale, Fielding kept a varied collection of birds in an aviary measuring 9 m x 9 m x 2 m, many of which bred, including both *Leiothrix* in the same year. The larger the aviary, the more chance there is of keeping and breeding species successfully, especially with mixed collections. Conflict between species is also liable to decrease proportionally to aviary size if occupants have been carefully considered.

BOUNDARY

Divisions between aviaries need to be nothing special, as there seems to be little conflict between pairs in adjacent aviaries, even when breeding. Gibson (1991) bred from Mesias in adjacent aviaries with no trouble, even though there had been aggression between them when kept together.

The sociable nature of *Leiothrix* and other species outside of the breeding season, can be accommodated in small adjacent aviaries if some form of connecting access are provided. This will allow birds to fly together making maximum use of available space from early autumn to late winter. In this respect, outside of the breeding season they can be housed with a number of similar sized species and live quite amicably.

When Rivers (pers. comm.) kept two pairs of Pekins in adjacent aviaries with a visual partition, one pair was still dominant and the second pair made no attempt to nest. The cock never sang and the pair skulked in the undergrowth all the time. When passed to a friend the birds bred immediately.

Most keepers use either wire, boarding or brick as a partition between aviaries but where glass is used as an aviary division, precautions need to be implemented before birds are introduced. Perhaps the best method is to use a chalk-based window cleaner. Completely cover the glass and leave in place for a week or so to allow new birds to become accustomed to the barrier. The chalky coating can then be given a light dusting over with a cloth to remove some but not all of it. Repeat the process every couple of days to remove more until it is finally clear some two weeks after introducing the birds. Removal of the barrier by gradually increasing the amount of clear glass is another option but this method allows windows of transparency through which birds may attempt to fly. From experience, the author recommends the former method of chalk removal.

When catching up any occupant of an aviary where glass is incorporated, it is advisable to repeat the coating but it can be removed immediately once catching has been effected. Once becoming accustomed to glass, birds will usually only attempt to fly through it when panicked, as when keepers attempt to catch aviary occupants, and over all it is comparatively easy to avoid fatalities.

WEATHER PROTECTION

In good health, *Leiothrix* are comparatively hardy birds. However, the cold encountered in their natural habitat is much drier than that experienced in a typical UK winter. It is therefore necessary to provide adequate shelter, as indeed it is for all captive birds.

Trying to coax birds to accept that a nice cosy shed is the ideal place to spend winter evenings is not the easiest of tasks to achieve so it is advisable to give as many options as possible. With *Leiothrix*, a large proportion of their time is spent skulking about in bushes and it is in these that they prefer to roost. The provision of at least one dense evergreen shrub or climber will be sufficient as it will create a fairly sheltered and waterproof site, establishing its own micro-climate, several degrees above surrounding temperatures.

The barest minimum for aviary covering should be several sheets of corrugated plastic on the roof to provide a dry area during heavy rain. A large percentage of respondents to the questionnaire provided more, covering over the whole aviary, the side facing the prevailing wind or both sides and all of the roof, with or without a solid panel to make it completely weather-proof. Several catch up their birds and place them inside for winter. Tomlins keeps his birds in a large shed with removable panels for when the weather is good.

Several owners provide frost-free heating, while others set temperatures at between 10 and 13 °C. Neither *Leiothrix* need temperatures this high in winter, but this is the ideal heat if birds within a mixed collection do need a little bit extra by way of temperature.

For such small birds the provision of additional lighting during the shorter winter months, at both ends of the day, to extend feeding time is a must. Several respondents even consider it more beneficial than heat. Additional light can be provided by either strip lighting or by bulb and should be controlled by a timer and dimmer system so the light gradually fades rather than becoming instantly dark. The provision of a low wattage nightlight is also given by several keepers and eliminates any chance of injuries caused by panic during darkness.

SUBSTRATE

As a genus, *Leiothrix* spend little time on the floor of their aviary so no special substrate is necessary. However, of the two species, perhaps Mesias have the edge on the amount of time spent poking about on the floor although both will go down to bathe and to search out any livefood that is thrown in for them. It is not therefore of special benefit to put in a specific substrate such as leaf litter for this genus to scratch about in as it would be for other babblers such as laughingthrushes that spend time turning over the substrate in search of food.

Ease of maintenance should be the first priority. Several respondents have a grassed area, which, while useful in attracting insects, needs constant care in summer if it is not to become a hazard to newly fledged chicks when it is wet. Pea shingle, gravel, peat, leaf litter, chipped bark and sand are all easy to maintain and should be used in outside aviaries. They can also be left with an earth floor, but over time this will become

compacted and hard to fork over when the time comes to give the aviary a clean. Several owners provide areas of concrete, which is where outside food dishes should be placed to facilitate ease of cleaning.

Shelters should be easy to clean. Wood shavings or sharp sand are the most frequently used. To decrease the risk of dust when cleaning out, spray lightly with a plant mister or use a dust mask. Out of preference, I would use sharp sand.

WATER

Fresh water is one of the most important aspects of any stock management regime and *Leiothrix* are no exception in benefiting greatly from such provision. Drinking water should be offered separately to bathing water in a well-stocked aviary. Although it is often impossible to restrict birds to the appropriate receptacle, it does give them the option of drinking cleaner water and also allows for water to be drained from deeper bathing facilities should any fledglings be present in the aviary. If bathing facilities are kept outside, and drinking vessels inside next to the area where fed, this may encourage the birds to drink when feeding. Having said that, many birds will drink prior to, or following, bathing.

Receptacles used for drinking purposes only need able to restrict birds from bathing in them and with this in mind, the clear plastic seed/water fountains are ideal. If too many birds are kept in the same aviary, one drinker may not be enough. In which case, either a second can be given or, alternatively, jam jar water fountains can be used. Bases can be purchased from many pet shops to fit normal jam jars, which are not usually supplied.

The list and form of bathing facilities that can be provided is limitless. Most respondents provide a shallow bowl of some type, be it a plant pot base, saucer or bowl.

A shallow, gently sloping concrete pond is a good choice for an outside enclosure as the depth can be altered as and when required should young be present in the aviary. It can also be beautified by the inclusion of a rock surround. Taken one step further some keepers provide running water for their birds and this, with the provision of shallow bathing pools, gives the aviary another dimension.

It is stated (Bates and Busenbark) that Pekin nests are frequently built next to running water. If this is so in the wild, it is not reflected in captivity as most breeding take place in aviaries without it. Those who are fortunate enough to have large landscaped aviaries do not give it as a prime reason for nesting. There are more important factors that need to be in place to achieve successful breeding.

Another aspect of water, which is well worth considering, is the provision of a misting system for hot weather. This can be a simple affair, especially if mains water is nearby. At its most basic, all that is required is a length of pipe, an adapter for connecting to a tap, an end stop and one or two fine misters. At its best it can be connected to an underground water supply with a stopcock, timer and incorporate as many misters as required. All these items should be available from larger garden centres or by mail order from irrigation suppliers advertising in journals such as *Amateur Gardening*.

The tubing should be tied or clipped to the outside of the aviary and run over the top, ensuring that it is placed over a suitable site for rain bathing. A bush is ideal and will also have the added advantage of allowing the aviary to be wetted prior to cleaning which

is always a help if hosing down is incorporated into a cleaning regime. If used during spells of hot weather, it will be much appreciated.

Always make sure bathing facilities are available to *Leiothrix*. They enjoy it. There is little doubt that bathing contributes much to the well being of this genus. Often many importers and retail outlets have far from satisfactory bathing facilities available to their new stock - most species would benefit greatly.

Both *Leiothrix* are devoted bathers. They will do so even in the coldest of weather. Simmons (1961) lists five types of bathing in Passerines:- (1) Bathing while standing in shallow water; (2) In and out bathing; (3) Bathing from the air; (4) Rain-bathing; (5) Foliage-bathing. Of these, *Leiothrix* and most other babblers are "in and outers", repeatedly jumping in and out of the water in a single session which may number many times. While briefly in the water they dip and shake their head, rapidly flutter the wings and ruffle their body feathers. As they hop away, they continue to shake the wings. They then return for another dip and repeat it many times. Apart from wrens (Armstrong) it would appear that babblers are the only other family of Passerines to bathe in this manner. Simmons also suggests that the fluttering of the wings as they leave the water is anti-predator behaviour, allowing the birds to rid themselves of surplus water from the plumage. The whole "in and out" process could be conceived as anti-predator behaviour but why is it virtually restricted to the Timalini?

Both species also bathe by fluttering around on damp foliage, mostly after rain but also in the mornings during dry spells when leaves are covered with dew.

PLANTING

In the wild, both species are found in scrub, bush clad open spaces, secondary regrowth, abandoned cultivations and tea plantations. There is little doubt that because they spend considerable amounts of time skulking around in vegetation in the wild, the provision of some amount of dense cover in their aviary will benefit them immensely. It is also required for nest sites, providing both structure and security.

The range of plants suitable is immense, but care has to be taken with types that are liable to grow too big for the enclosures. Most varieties can be pruned but may ultimately lose their shape rendering them unsuitable for nesting purposes.

Vines and creepers are an ideal group to consider as most only need to be top pruned if leader shoots are not trained. Their structure remains relatively open while the leaves provide the cover. They can be trained through aviary netting, up aviary supports and over logs and stumps. Two breeders reared Pekins from nests built fairly low to the ground in ivy-covered stumps. If the vegetation is allowed to climb up netting, ensure that the thicker stems are pruned out every couple of years to prevent them from breaking the wire and creating an easy access for vermin.

Clematis and honeysuckle are the two most popular choices and a wide range of species and forms are available. If possible try to have at least one evergreen creeper in each enclosure to provide at least some suitable nesting cover should birds start to show signs of nesting early in the year. Clematis can be fairly robust and need to be watched so choosing the right one is important, although most people have their preferences, whether it be the large-flowered hybrids or the generally, smaller-flowered species and their varieties. Personally, I prefer the small flowered species and as an evergreen, *C. cirrhosa*

and its various forms are ideal. It is not too rampant and in most localities keeps its leaves all year round, although it can lose them in the autumn in which case they are replaced almost immediately. An advantage with this species is that it is early flowering, usually in March and April but often much earlier. Another suitable evergreen species is *C armandii*. Of the deciduous types, a great favourite is *C. montana* (pink/white flowers) as is *C. tangutica* (yellow), *C macropetala* (blue, pink and white) and *C. orientalis* (creamy-white).

Honeysuckle, although not available in anywhere near as great a variety as clematis, is available as evergreen and deciduous climbers and shrubs. Space should be made for at least one of the forms of honeysuckle. Evergreen climbers such as *Lonicera henryi* and *L. japonica* and evergreen shrubs such as *L. standishii* and *L. nitida* are ideal and should need little minimal maintenance as they rarely grow above 2 m in height.

Of the more exotic creepers available, Passionflowers (*Passiflora*) are used but in the UK are unlikely to provide the cover necessary for breeding though they have a wonderful leaf form that is quite showy. Few species are hardy. *Passiflora caerulea* is the species seen most often and it will survive outside during mild winters if given a protected site in southern England. *Passiflora* do however, produce acceptable fruit at the end of a good summer which is relished by many birds. Numerous others are available, some of which should cope in our climate with a little care. Growing in pots is perhaps the best ploy with this group, bringing them inside for the winter.

Other species of climbers that can be used successfully are hops, jasmine, ivy and Russian vine. If aviaries back on to a solid wall, Virginia creeper or one of the other *Parthenocissus* can be used as a wall covering but ensure it is not allowed to become too rampant. Take no notice of the standard ten feet in ten years growth expectancy as stated on the label of most climbers, as it is very misleading. Runner beans are a good annual climber to use as a creeper. They can be trained around twiggy supports and have the bonus of later being attractive to blackfly. If not, you may get a good crop!

Each aviary should have at least two bushes in them and again, if possible, one should be an evergreen. Many are available. Box, privet, choisya, holly, laurel, fatsia, buddleia, pieris, cotoneaster, pyracantha, escallonia, snowberry, fuchsia and elderberry are good choices.

The list is large for both shrubs and climbers and it is well worth thumbing through the gardening books and visiting a garden centre to see what is available.

Other plants can be used. Bamboo is likely to be an important plant, as and when it reaches a suitable height. Only one keeper (Isenberg) mentions growing bamboo in his aviaries and his Mesias built and successfully bred in it. It is the only grass likely to be of use for these birds. Keep away from Pampas Grass as the leaves can sometimes lose fine shreds which are like coiled springs. I have lost one laughingthrush that got one of these around its neck and recently rescued a Blackbird with a much larger piece of coiled leaf restricting its airflow. The seeding heads of Pampas Grass however, can be collected and may be of use as a nest material, if not by *Leiothrix*, then by other species.

A number of keepers grow conifers, which is fine. More rampant species will need to be kept in check, which may ultimately ruin their suitability as a nest site but may still provide adequate cover. One keeper has a Chusan Palm planted in his aviary which, although not much use as a nesting site or cover plant, is liable to provide a supply of fibre suitable as a nesting material.

The other angle to look at is planting to attract insects. A patch of nettles take some beating. Nasturtiums, lavender and buddleia are ideal garden plants worth considering.

Whatever is planted in aviaries, it is important to leave one corner, the most accessible, free of obstruction so birds can be chivvied towards there and caught.

Several keepers have noted both Mesias and Pekins have a liking for nipping off the buds and shoots of plants. This destructive behaviour can be partially overcome by growing evergreens, but if damage continues to be a problem the provision of a variety of greenfood is likely to help. Trial and error is the key – try any of the commercial greens such as lettuce, broccoli, cabbage or salad cress. Freshly cut branches of willow or sallow with new leaf shoots bursting or any of the usual wildfoods such as chickweed or groundsel may provide the answer (Coles, 2003).

PERCHING

Because both *Leiothrix* spend considerable amounts of time skulking away in bushes, the provision of additional perches is probably not necessary if there is good plant cover. If not, the inclusion of cut branches can be incorporated to give additional perching. It is important, as with planting, to leave one corner free of obstruction so birds can be chivvied towards there when catching.

Inside perching in shelters can be of dowelling, either 12 mm or 18 mm diameter. If shelters are well used, the provision of natural perching is preferable and the straight stems of hazel, willow or elderberry can be used as such material is more beneficial to birds' feet in the long term. Cut branches of fir are likely to be a more attractive alternative. Placed high in a corner, not only will it be used as perching, the additional cover may even persuade them to roost inside. Out of choice birds will not roost on straight perches that are out in the open unless forced to do so.

SUN-BATHING

Leiothrix like to sun-bathe. They adopt the usual Passerine posture of leaning to one side, head slightly cocked and feathers ruffled. They will use a perch, occasionally the ground, but most frequently a patch of sunlight shining on the top of a bush. It is worth considering where the sun shines on a bush and trimming away a couple of stems to open it up to create a larger area for the birds in which to soak up the sun. If there is nothing, placing a perch or two in a patch of sunlight will be much appreciated.

MAINTENANCE

A safety porch or double-door system is useful when keeping these birds in small aviaries, as, although Pekins and Mesias spend most of the time skulking in foliage, they can be very quick when the mood takes them. Safety porches should be large enough to take the largest item (e.g. lawnmower) that is likely to be taken into the aviary so that one door can be shut before the other is opened.

Cleaning regimes should be governed by the number of occupants in the aviary and can be judged over time on the amount of droppings produced. Care should be taken

that there is no build up beneath favoured perches. In particular bushes used for roosting and nesting are liable to be prime spots and should be checked regularly.

Aviaries can be raked or dug over periodically and hosed down to remove droppings, which, if done following rain, will make the task easier. Any regime should be altered to reflect any breeding taking place for disturbance at this critical time needs to be kept to a minimum, although *Leiothrix* are fairly tolerant if the usual patterns of daily disturbance is followed.

Inside accommodation should be able to withstand a thorough cleaning with a disinfectant solution.

LIBERTY

The release of any alien species in the UK is against the law and covered under the Wildlife and Countryside Act (1984) Section 14 (1). Hence, other than an occasional escape lasting a short period before capture was effected, there are very few recent accounts from the UK. Rishman (1991), in Canada, tried liberating a pair with chicks in the nest after several failed rearing attempts in the hope they would collect their own livefood. This "worked well for about four hours until the parents decided it was much more fun to play in the trees". They both returned to the aviary early in the evening but the chicks were cold. No age is given for the chicks when Rishman first experimented with liberty but this is more likely to succeed if chicks are several days old and the routine of feeding chicks has been established rather than if chicks had just recently hatched.

Two periods of "mass liberation" of captive birds in the UK occurred during the two world wars. The Duke of Bedford, writing in his autobiography "The Years of Transition" says of Pekins in a short chapter devoted to the liberation of foreign birds at Woburn Park prior to the 1914-18 war...."Pekin Robins left the garden, but established themselves in a dense privet plantation near one of the ponds. There they maintained themselves in a practically wild and independent state for a number of years but ultimately they disappeared. They are charming little birds and very sweet-voiced, but secretive and difficult to see". No mention is made of breeding.

Over the years the Duke of Bedford maintained a number of species at liberty, the most successful being a flock of Budgerigars which survived for many years. He also recorded the first UK breeding of the Lemon Dove *Aplopelia larvata* at liberty in 1908.

When World War II broke out in 1939, Boosey (1962) liberated Pekin Robins at Keston Foreign Bird Farm but they only stayed for several weeks, spending most of their time in the thickest undergrowth where he was able to hear their song though he saw them infrequently.

Alfred Ezra (1933) who reported liberating forty Pekins in May 1932 stated that only half a dozen still remained the following May, although several pairs had laid and hatched young.

The most successful and disastrous liberation occurred on the Hawaiian Island of Kauai where they were introduced in 1918. Having colonised several islands of the group they now compete with highly specialised endemic species.

DIET

BASIC DIET

Leiothrix feed on insects, seeds and berries in the wild. Being omnivorous, both species will take a wide variety of foods and this is evident from the great diversity of items offered by aviculturists. The basis for most diets is one of the many proprietary softfoods available to the aviculturist - Prosecto, Quiko, Witte Molen, Cede and EMP, all of which are termed general or universal types. Only one respondent offered a low iron softfood. There seems no evidence of Iron Storage Disease in *Leiothrix* but equally, there are no autopsy reports to pursue this matter.

Most proprietary softfoods contain either dried shrimps or juniper berries for many small softbills will take these. It is worth considering that if they do, to add extra amounts. These, along with a variety of other dried fruit, berries and insects, are available from Livefood Direct (01909 568953) and Rob Harvey Specialist Foods (01420 23986).

Most keepers change their softfood daily while others leave a bowl in and feed *ad lib*, replacing when consumed with fresh amounts. Care needs to be exercised that food does not become soiled, stale or become mouldy.

Fruit forms a large part of *Leiothrix* diet and a surprising range is offered by keepers - apple, pear, grapes, orange, kiwi fruit, banana, pawpaw, figs, pomegranate, plus dried fruits such as raisins, currants and sultanas. Tomlins offers the widest choice; besides the usual types of commercially available fruits he also feeds, seasonally, Elderberry, Rowan berries, Blackberry, Raspberry, Tayberry, Red Currant, Black Currant, White Currant and the berries of pyracantha, cotoneaster and privet.

Most keepers dice their fruit, some spike halved fruit on nails or place it in a bowl for the birds to pick over. Only one owner offers sweetcorn and peas and rather surprisingly no one offers tomato.

Other items given are grated or finely diced cheese, boiled or raw minced beef, hard-boiled egg, soaked dog biscuit, boiled rice and seed. A wide range of softbills take seed and their liking for it generally comes to light when they are kept with seedeaters. Canary seed and the various millets, either as separates or in mixtures, such as those produced for Budgies and for both British and Foreign finches are offered specifically to *Leiothrix* or other inhabitants of enclosures. Tomlins provides wild seeds and greens for his other birds and states they are also taken by his Pekins. These are Persicaria, Dandelion, Groundsel, Sowthistle, Nipplewort, Chickweed and the grasses, Annual Meadow, Rye, Couch, Canary *Phalaris arundinacea*, Timothy, Cocksfoot and Meadow Foxtail. He also offers wheat germ and oatmeal.

Livefood is greatly relished and offered by most owners as part of a basic diet. Mealworms seem to be the favoured type with most keepers restricting consumption to a maximum of six per day. The birds will take most types of commercial livefood - any of the smaller mealworm types and stages (grub, pupae, and soft-shelled adults), Buffalo Worms, crickets, early instar locusts, waxmoth (larvae and moth) and fruit flies. They will also search out and catch insects that enter their aviary. Houseflies, craneflies, bees, wasps, all aphid species and moths are just some of the wild forms taken.

Wild insects can be encouraged into enclosures by various means. Growing runner beans (blackfly) and roses (greenfly) against the side of an aviary will attract

aphids. The former can be grown using the aviary netting as support and, being an annual and fairly soft stemmed, they will not damage netting. Moths can be attracted by a low wattage light bulb left on at night for several hours; moths will settle in the vicinity of the bulb and be searched out the next day. A mercury vapour moth lamp should not be used as it will soon decimate moth populations if all are used for birdfood. Wasps and flies can be attracted using either honey or sugar water, making sure that any container is adequately covered to ensure birds do not drown. Fruit can also be used, which is probably a safer option. Bees can be enticed inside an aviary by planting one of the many plants attractive to them such as lavender or buddleia. Water will also attract midges.

Pekins and Mesias seem reluctant to eat earthworms (Gibson). There are mixed reports on maggots, with some breeders reporting their birds eat them while others say they steadfastly refuse to take them. Interestingly, on this last point, pairs that refuse maggots are offered wide varieties of other insects. Personally, having witnessed Botulism caused through the feeding of maggots, albeit some time ago, I would not feed them although they are reputedly much safer to use these days. Wasp larvae and ant pupae are also eaten when offered. Some birds will also take honey water and nectar mixtures.

Greenfood in the form of buds and new leaves are also consumed, which may play havoc when trying to establish plants, but which will benefit the birds greatly. Rishman moved a pair of Mesias to a small aviary planted with bamboo, cotoneaster and forsythia. Over a two week period they systematically removed every leaf until only the greenery on a fir was left untouched. Try offering either commercial greens (lettuce etc.) or a soft-leaved wildfood such as chickweed to minimise damage to aviary herbage.

Gibson also offered grit (see Health).

DIET ENHANCEMENT IN PRE-BREEDING SEASON

Many respondents do not alter the diets for their birds to coincide with the onset of the breeding season, while others increase livefood, mainly mealworms, to help bring birds into condition. Diets are likely to be enhanced naturally with the advancing of Spring through the increasing availability of wild insects, and these will be taken with relish by both species.

SPECIAL DIET REQUIREMENTS

The provision of livefood, especially in the early stages of development, is essential if young are to be reared. Dummert (Barnicoat) states that newly hatched young were deposited dead on the feeding table. Chicks were only reared when the livefood elements of their diets was addressed. Both Rivers and Gibson (see Health) point out a problem encountered when Pekins fed their young solely on mealworms. However, at least four respondents state their only additional livefood at this crucial time was mealworms and none report a problem but equally, no data is given on the number of young reared.

Livefood is essential, and while mealworms are undoubtedly the most economical to purchase, varying diets with other types is likely to have increased benefits. Mini mealworms, Buffalo Worms, second or third instar crickets, fruit flies and white

mealworms (growing larvae which have just shed their skin) are the best commercial livefoods to offer newly hatched chicks. As the chicks grow, regular mealworms, wax moth larvae and adult crickets can be given. One breeder offers whiteworms and several offer cleaned maggots. Dummert, in South Africa, offered termites during the breeding season. These are an abundant and valuable wild livefood in countries where they are found and are to be highly recommended.

The only additional non-livefood item offered while young were in the nest and not given as part of the basic diet is bread and milk sweetened with honey. Lee states his Mesias, upon hatching young, fed livefood and sponge cake for the first four to five days. After this they appeared to take lettuce and soft pear to the nest. Overall, from this age, the parents seemed to feed mostly sponge cake and soft pear with very little livefood.

One keeper provides compost and manure heaps to attract flies - grass clipping and leaves will also attract insects and simply turning over the heaps will expose livefood. Another keeper collects from nettles that, if time allows, can be very beneficial in the early days of a chick's life. Before the wide variety of commercial livefood was available, nettles provided the small invertebrates needed to give the chicks of smaller softbills a start and I have used them on numerous occasions, most successfully when rearing a Tacazze Sunbird in 1977 at Padstow Bird Gardens.

The method I adopt is simple. A net is by far the best way to gather livefood. This can be purchased or homemade using a nylon stocking stitched on a loop of wire connected to a handle. Nets are subject to a lot of wear and need replacing frequently. On a fine day all that has to be done is to find a patch of nettles and sweep the net through. On wet days, however, the catch will be less than satisfactory. The contents can then be placed in a large jar for transporting. Long grass can also be swept with a net though such vegetation is generally less productive.

Livefood will have to be fed frequently when chicks are in the nest, especially if other softbills are housed in the same aviary. Several breeders replenish livefood up to six times a day, which of course is not possible for all keepers. Even if no softbills are present, some seedeaters are rather partial to livefood, even if not breeding. During breeding, the supply of ample food will be the single most important factor to success.

During the course of keeping, and especially when breeding, mealworms are still going to be the most used form of livefood. Although fairly economical, the best way to buy is in bulk. Both Livefood Direct and Rob Harvey Specialist Foods (see Basic Diet) supply in bulk and buying 2 kg of mealworms at time will work out to be economical in the long term. The author has kept a 5 kg bulk purchase ticking over for five winter months by just keeping it cool and feeding the mealworms on bran adding an occasional slice of apple or carrot for moisture. During the summer months the duration will be reduced to around two months unless kept in a cellar or similar situation where temperatures are likely to remain stable and cool. Done correctly, there should be minimal loss, but before feeding to chicks, the mealworms should have their food value increased either by dusting with or feeding one of the special diets that are now available to allow incorporation of important vitamins and minerals which may have been lost in prolonged storage.

The Mesias owned by Rishman took guppies when feeding their young. At what age they were first taken is not stated but during the three week rearing period, 2000 "feeder" guppies were consumed along with 2500 crickets and 8000 mealworms. Spiders

are a particularly good food for small softbills and Gibson states that on the two occasions when spiders were offered for the first couple of days, the success rate for Pekins was much higher. Collecting large quantities of this valuable livefood is a laborious task but it should be needed for only a short time before other forms of livefood can be given.

Although the breeding of hybrids is not to be encouraged, the novel way Cleaver (1975) had of collecting livefood for his Pekin x Siva chicks is unlikely to be available to many but may amuse. Mr Cleaver had a swimming pool in his garden that each morning had a number of brown beetles in it, presumably attracted by a light the previous night. These were scooped out of the water each morning and were eagerly accepted by the chicks. Not wanting to poison the birds he stopped putting chlorine and other chemicals in the pool which, in time, made it turn green, attracting more insects. Don't know if a child's paddling pool would be as beneficial! If chicks will take beetles, it may be worth setting up mealworms well in advance of the breeding season to have some ready in time.

When *Leiothrix* have young is the time when the greatest variety of livefood is likely to reap the most benefit. Below are several sections from THE CULTURING AND COLLECTING OF LIVEFOOD FOR AVIARY, AQUARIUM AND VIVARIUM (Coles 2003) which may assist in providing a greater abundance of livefood at this critical time.

ANTS

Very few bird species eat adult ants but the nutritious pupal stage, commonly known as "ant eggs" is taken avidly by a variety of creatures. Culturing is a relatively straight forward matter but, because of the vast number of pupae that can be eaten by a comparatively small number of individuals, culturing large scale, to satisfy all your needs, is not a practical proposition. Breeders wishing to experiment are advised to consult the reference section at the end of these notes for construction details of an artificial chamber for those ant species which live below ground, and for a nest to accommodate Britain's largest species, the red and black Wood Ant *Formica rufa*, whose large nest mounds are often found in pine woods. It is from the Wood Ant that commercially available pupae are obtained, mainly through importations from Eastern Europe.

To all intents and purposes the collection of fresh pupae is the most favoured option and can be easily achieved. The Red *Myrmica rufa*, Black *Lasius niger* and Yellow Ants *L. flavus* are all common species about the garden, building their colonies under stones, rotting wood or at the base of walls. In these species, pupae are visible once the object under which the colony exists is removed. Early afternoon is the most productive time to search as pupae are brought close to the surface on warm days.

As colonies which nest in close proximity to man are often of nuisance value, the whole nest can be removed. Using a trowel dig out the whole nest, or part as required, and place in a bucket or directly onto a sheet. Low, dark areas must be provided so the ants can transport their pupae to a safe place. This is best done by turning over the corners of the sheet which can then be periodically lifted and the accumulated pupae collected. This method can also be adopted for the Wood Ant but a much larger sheet is required, and a spade, rather than a trowel, should be used. It is possible that, when using

this species, a surplus of pupae may arise, in which case they can be frozen for later use. Caution must be exercised however, as this species not only bites but is capable of squirting formic acid in defence. This is a painful irritant, especially if contact is made with eyes or broken skin, and should be washed off immediately.

Few species will eat adult ants but if keeping a species that will, the best method of collecting is simply to place slices of apple, orange, or for that matter, any variety of sweet fruit near an active nest. After a short while, simply pick up the fruit and its passengers and drop it into a sealable container. Feed to stock as soon as possible after capture. Cloth moistened with sugar solution or honey water will also attract adults. Ants will survive for a short while but trying to keep them for any length of time is not recommended. Pekins, and possibly Mesias, are known to "Ant" and it would certainly be worth providing at least some to give the birds the opportunity to do so.

APHIDS

Aphids are abundant in the warmer months of the year and many species are to be found in Britain. Most are host specific, completing their complex breeding cycle on only one type of plant. Several, however, use more than one and, in such cases, each plant is an essential requirement for a particular period in an aphids' development. The summer host is usually the most productive in terms of harvestable insects and it is these that should be encouraged or planted if aphids are to be utilised as livefood.

Although aphids are taken by only a limited number of species because of their small size, their collection is worthwhile in order to add variation to an otherwise restricted diet. Species that will take aphids tend to be small insectivores and as such they can form a substantial part of the diet of some reptiles and amphibians. The types most likely to be encountered are the Black Bean Aphid *Aphis fabae*, a species able to live on a number of plants, including elder, nasturtium and most varieties of cultivated bean plants, and also, the "greenflies" which infest roses and nettles.

Collecting is easily done by removing the infested section of the plant, if practical to do so, or by removing the aphids with a fine paint brush. If small numbers only are required periodically, the colony can be left intact and a number removed as and when needed. If a heavily infested plant is located, surplus aphids can be frozen. This is best done by placing cut pieces of the plant, complete with aphids, onto a tray in the freezer and, once frozen, usually in a very short time, a light tap will be enough to dislodge them and they can then be placed in containers and sealed for later use. Doing it by this method ensures that individuals remain separate and do not result in a solid, sticky mass.

Encouraging the Black Bean Aphid is simply a matter of growing broad or runner beans in pots - before long and with conducive weather conditions, aphids should soon colonise the plants and multiply rapidly. If they don't, look on the bright side, you should have a good crop of beans!

Aphids have a breeding system conducive to mass production. Over-wintering eggs hatch to produce wingless, parthenogenic females which, once mature, give birth to live young. These, in turn, do likewise leading to many generations being produced in a short space of time. Some winged females are produced by each generation and these fly off to start new colonies, hence the sudden appearance of aphids in areas that only days before were clear of them. As autumn approaches, some males are produced and mating

takes place to provide the eggs needed for over-wintering. This is a much simplified explanation of what, in reality, is a very complex breeding cycle. Suffice to say, if properly managed, aphids can produce an abundant source of livefood for the species that will take them.

SPIDERS

It is unfortunate that none of the numerous species of Arachnids lend themselves to culture on a worthwhile scale. They are one of the most useful of livefoods, especially for the keeping and breeding of insectivorous and nectar-feeding birds.

The chief advantage spiders have over most other forms of livefood collected from the wild is that they are still available late into the autumn, well beyond the peak of wild invertebrate abundance and can, therefore, be quite a valuable addition to the diet at that time.

Spiders are present in most habitats but are more abundant, both in terms of species and population densities where there is a proliferation of other invertebrate species upon which they prey. Nettles are an ideal place to search for them and they are best collected by sweeping a net through the tops of the plants. This method has the added bonus of bagging a variety of other insects. Sweeping verges and tall meadow grass also proves worthwhile, as does ivy, which produces a number of the large *Araneus diadematus*.

In some localities, ground dwelling *Pardosa* are numerous and are often seen scuttling across lawns or waste ground. Catching can be effected with a jar, a net, or even by hand. Any spiders caught should not be kept together for prolonged periods for they tend to be cannibalistic and numbers are soon reduced. If intended for release into an aviary, foliage will ensure ample hiding places allowing them to keep out of each other's way for long enough to be of benefit. Once birds become accustomed to this, they soon learn to search for the spiders when released.

Although impractical to culture, the removal of egg-masses can produce an abundance of tiny spiderlings in spring. Egg-masses, located in autumn and winter, can be left *in-situ* until the following spring when they can be gently removed to a container for hatching. Resultant spiderlings should be fed to stock immediately. Corners of windows, beneath shelves and inside old buildings are all likely hunting places for egg-masses. If a note is made of all those found, then, come spring, quite a number will have been located.

COLLECTING LIVEFOOD FROM THE WILD

The true value of collecting from the wild depends on the amount of time one is able to devote to it, for it is generally, a very time consuming business. However, with certain species of birds, reptiles and amphibians the need to provide a particular form of livefood, especially where newly hatched young are concerned, makes it a chore that has to be done if success is to be achieved. Purchased livefood is convenient, but if a species has young and are proving difficult to rear on commercial livefood, then collecting from the wild will usually provide the answer.

A wide array of creatures can be caught if searched for in the correct locality. Pit-fall traps (shallow containers sunk in the ground) have only a limited use for, quite quickly, predators get to know the receptacles and thus are provided with an easy meal! When collecting, one must constantly be aware of the need for conservation and so, for this reason, moth traps should be avoided, other than for use on farmland and in gardens where research has shown little effect on populations if used in moderation. Indiscriminate use of moth traps could do untold damage unless one is expert in the identification of nocturnal Lepidoptera; and can, thereby, release rare species from the trap.

The general rule for collecting is to restrict it to areas where one or more common plant species occur abundantly. Invertebrates tend to be host specific in their requirements, either for each stage of development or its entirety. It is therefore less likely to cause decimation of a fragile population if collecting is restricted to areas dominated by nettles or ivy, as it would, say, in a mixed woodland where a tree species may be represented by only a single specimen, which, although it may not be a rare species, may represent a habitat for nationally common, but locally rare species. Gardens are a particularly good place in which to collect.

Another method sometimes used is beating. This involves placing a sheet under a tree and beating it with a stout stick. However, while this yields a certain amount of livefood, the use of a net is preferable if you have a choice. When collecting, a site that is known to be free from contamination must be used, uncertainty can lead to loss of stock through poisoning.

On a final note, legislation in some countries prohibits the taking of certain species, and by certain means. If in doubt, always check with the appropriate authorities as the author cannot accept responsibility for the contravention of any such regulations.

BREEDING

BREEDING GROUP SIZE

Like many other babblers, out of the breeding season, *Leiothrix* are quite sociable birds forming mixed flocks in the wild and some keepers replicate this by running their pairs together at this time of the year without trouble. Pairs should be separated in late February or early March in ample time for them to settle and avoid possible conflict.

In captivity, during the breeding season, where more than one pair is held, most keepers seem to keep pairs separate because of squabbling, fighting or the dominance of one pair. There are exceptions to the rule, as one would expect, but answers such as "Hen of one pair killed other hen" and "Male harried other male until he had to be removed" indicates that it is best perhaps to keep only one pair of each species to an aviary. Several breeders that do keep more than one pair together state that one male will become dominant but fail to mention if it eventually deteriorated into aggression.

Some report no trouble at all, but it is likely to decrease any chance of breeding. Tomlins kept three young (1.2) with their parents for three years with no trouble until the old pair died but they did not breed while the offspring were present. Fielding kept a trio together and did breed them, but his aviary was 9 m square. Gibson also states that both

his Pekins and Mesias would not tolerate others in the same aviary during the breeding season.

Several keepers report housing both Pekins and Mesias together during the breeding season with no adverse effects and Fielding bred from both in the same year, as did Dummert in South Africa. Both these breeders housed their birds in very large, planted enclosures, measuring 9 m x 9 m x 3 m and 11 m x 6 m x 5 m respectively. Dummert however, kept two pairs each of both Pekins and Mesias but reports only one pair of each bred. However, Rishman, in Canada, states that when he kept both species together a dominant pair of Pekins commandeered a nest built by Mesias and appeared quite content to stop anybody from laying. He does not indicate size of aviary or how heavily planted it was. They only bred when they were moved to a 2 m x 1 m 2 m flight.

PARENT-SIBLING CO-OPERATION

Unlike other babblers such as *Garrulax* and *Turdoides*, I can find no trace in any avicultural or ornithological literature of the young from either *Leiothrix* co-operating with their parents in the rearing of subsequent broods during the same season. However, two respondents, both with Pekins, witnessed a limited amount. Bradburne (pers. comm.) has recorded assistance given by only females whilst Hay (pers. comm.) had one bird only assisting (no sex given).

From a captive viewpoint the main drawback with helpers is the sheer volume of livefood that needs to be provided to cater for the extra mouths. Priority is given by helpers to the feeding of chicks but once their appetites have been sated, they will then tuck into what is left of the livefood. Several respondents give this additional livefood burden as the sole reason for removing young once independence has been gained.

CO-EXISTENCE WITH OTHER SPECIES

Conditions within an aviary often dictates who gets on with who but both Mesias and Pekins can be classed as ideal mixed collection species. There are however, instances where there has been trouble, as one would expect with species that have been kept by so many breeders over the years and shared their housing with such variety of species and in vastly differing conditions.

Probably the single most important factor is being able to provide enough aviary cover to allow them to behave naturally. Lack of it is liable to cause frustration and agitation and manifest itself as aggression, as is does in many species that feel uneasy with their surroundings.

Virtually the whole gamete of small to medium-sized seedeaters and smaller softbills has been kept with both *Leiothrix* with very little trouble being noted. Prevailing conditions will dictate, especially during the breeding season, at times of overcrowding or the introduction of new birds. Lee, in particular, noted aggression in his Mesias on the introduction of new birds which otherwise lived happily with established occupants.

The list below, while not exhaustive, does give an idea of some of the species they have been kept with and is worth including, if only to give less experienced keepers some ideas. All have been mentioned in available literature and by respondents.

Diamond Doves, canaries, Japanese and Chinese Painted Quail, Zebra Finches, Java Sparrows, firefinches, numerous weavers and waxbills, Yellowhammers, Green Singing Finches, rosefinches, House Sparrows, Greenfinches, various Australian Finches and Tomlins currently keeps his Pekins with 18 species of munias. Softbills include Red-whiskered Bulbuls, minlas, Yellow-bellied Tits, Yellow-throated and Spectacled Laughingthrushes, yuhinas, Amethyst and Spreo Starlings, sunbirds, fruitsuckers, zosterops, Japanese Waxwings and fulvettas. Larger birds include Turquoise Parakeets, Golden Pheasants and Mandarin Ducks.

As can be seen, this genus will mix with numerous other species but it is unlikely that they will be inclined to rear if kept with some of the above, especially softbills. To rear both species, Dummert (Barnicoat) had to provide mealworms and termites every hour during the first few days following hatching, a provision not many breeders will be able to supply. The rule of thumb for breeding is to keep Pekins and Mesias with non-competing species and not to overcrowd.

The only record I have of either species killing adult birds of other species is provided by Carnell (pers. comm.) whose Mesias killed a pair of Blue-winged Siva within a day after spending over two years in the same aviary.

One breeder states he had trouble with Green Singing Finches being aggressive to Pekins. It is quite likely that generally aggressive species will be that way with *Leiothrix* as they are inquisitive birds and like to know what is going on. As long as there are ample food stations and sufficient cover into which they can retreat, they should be safe from most species.

Another problem that was brought to light by Rivers (2000) is that of cannibalism in Pekins. It is a problem that still needs further investigation as to whether it occurs when Pekins themselves have young or is a trait more widely practised. Rivers' Pekins shared their aviary with Chinese Painted Quail which were incubating eggs behind a piece of board leaning against a solid back. When the eggs hatched, the Pekins were observed to actually seek out the quail chicks from inside the nest. Despite the efforts of the female quail to defend the chicks, the Pekins took the chicks to a perch and proceeded to rip them to pieces, starting with the head. This was then fed to their four day old chicks and by the time they had finished, all that was left were the legs and adjoining skin. He goes on to say that mysterious disappearances from canary and other nests in the past may well have been down to Pekins.

Far from being a behavioural trait with one pair of Pekins, Hay also witnessed the same behaviour with his pair. When they had chicks, young Chinese Painted Quail chicks would be caught and their heads ripped off. They then attempted to feed these to their chicks.

Tomlins reported the unwitnessed disappearance of small finches including a nest of fully-grown Javan Mannikins. The initial culprit was thought to be either a Red-whiskered or White-cheeked Bulbul but even after these were removed, the odd fatality still occurred. However once the Pekins were removed the fatalities stopped. Hutchinson (pers. comm.) also had Pekins take young silverbills from the nest but left well alone a pair of Red-whiskered bulbuls that were rearing young. In the last two instances, neither pair of Pekins was rearing young. It would be worth keeping an eye out for any mysterious disappearance of nestlings and consider either moving the Pekins or the aggrieved to another aviary.

Rivers suggests that the possible inclusion of a little raw mince into the diet may assist in curtailing this trait and it will be interesting to see if it does have any effect. At least two breeders say their Pekins will not eat raw mince but at least three pairs do. Another possible solution to this may be to offer larger forms of livefood from an early age to compliment smaller types - because chicks grow so quickly, there may be a fine line between providing small and the need for larger livefood. Rivers did offer larger livefood but it may be the case, as in egg eating, once they acquire the taste it is difficult to break. This may not be the case but is worth doing the first time chicks hatch. Both species are capable of dismembering prey, so it would certainly be worth trying giant mealworms. Similarly, third or fourth instar locusts might be accepted, as perhaps would "pinkies". These are newborn mice, which lack any fur and should be obtainable frozen from larger pet shops dealing in the requisites for reptile keepers. It would definitely be worth trying these if any birds should develop a tendency towards cannibalism.

Eating the eggs of other species is another trait associated with Pekins. Not all keepers agree but at least seven said they have found or seen evidence of Pekins eating eggs. Gibson didn't and reared, over the years, Cockatiels, Bourke's Parakeets, Diamond Doves, Blackbirds, Cut-throat Finches, Strawberry Finches, canaries and Gouldian Finches in the same aviary as breeding Pekins without much trouble. On one occasion, the Gouldian's laid the same day and each reared three young, in nests that were built at the same height about four metres apart. Each would drive the other off if they approached within about a metre of the other nest but they would collect food from the same feeding station.

For *Leiothrix*, like many of the babblers, egg-eating probably stems from their inquisitive nature. Once becoming accustomed to egg-eating, it will generally stay with them though only occasionally manifesting itself to include their own eggs. Egg-eating usually starts when a broken egg is found and sampled, so it is best to remove any signs such as shell and any residue once seen. If birds go into nests after eggs there is little that can be done other than to remove the birds you least want to breed from to another aviary. Ensure, also, there are ample nesting sites and receptacles for the birds kept - chances are two pairs will squabble over the same location. Try to keep them uniform, and if possible, at the same height if using boxes.

All the references to egg eating and cannibalism that I have been able to trace concern Pekins. At no time have I heard Mesias mentioned in this respect and, as of fact, Isenberg states that in over 20 years experience with Mesias, he had not known any nest robbing. However, because of these traits in Pekins, it may be more widely practised than thought and it would certainly be worth keeping an eye on Mesias if there is any doubt over the mysterious disappearance of either eggs or young from nests, especially if conditions are overcrowded.

NEWLY IMPORTED BIRD SUCCESS

As with all breeding, success is dependent on the birds' condition. So, it figures, the purchase of birds that are reasonably active and of good feather is likely, not only to give a good chance of survival, but of breeding success in the shortest possible time if the right conditions prevail.

For imported Pekins, breeders report anything up to three years before nesting was attempted but success was achieved in the majority of cases in their first or second season. Three breeders purchased their pairs at the National Cage Birds Exhibition in December and reported nesting from mid to late summer. Others missed a season and started early the next year.

Little information is available for Mesias but most pairs seem to have been established for some time before any attempt is made. There is only mention of one pair having laid or bred successfully in their first year of trying and that was by a pair purchased straight from quarantine by Lee, early in 1987. He reports that in October of that year his pair laid and he gives the impression, although not specifically stated as such from that nest, two young were reared. Perhaps the paucity of Mesia records is reflected in the overall lack of breeding success as compared to Pekins.

ESTABLISHED PAIR DISTURBANCE

Both *Leiothrix* are hardy birds and are often given access to outside flights all year round by many keepers, especially in southern areas of the UK. Those that do keep them inside during the winter months do not note any significant disturbance to breeding once given access to outside aviaries. Two breeders that do keep Pekins inside during winter report their pairs commenced nesting in April. Established proven breeding pairs of laughingthrushes can be moved to different aviaries and, providing conditions are right, will continue to breed relatively quickly (Coles) and there should be no reason why *Leiothrix* will not do the same.

Gibson reports this with his Mesias where the young from the previous year were left with their parents. These young became dominant and the adults had to be removed to another aviary where they nested shortly afterwards. Three breeders of Pekins (two with established wild caught and one with captive bred birds) report nesting three months after arrival. Tomlins (pers. comm.) purchased a pair of Pekins that had been with their previous owner for four years which, after only one week, commenced nesting. This pair was kept with other birds but with few competing species, given a good diet and provided with plenty of plant cover. Most pairs when established should at least attempt to nest if provided with what they need.

ESTABLISHED PAIR SEPARATION

The loss of one of a breeding pair can bring an abrupt end to any future progress. Sadly, many breeders move on most young that are reared, failing to retain any for the future. Losses at some point are inevitable and birds will need to be replaced. The only reference to re-establishing a pair in all the notes to hand was by Rivers who, after three years of success, lost the hen. He then paired the cock to a yearling hen and they bred the same year.

Available suitable space precludes surplus birds being kept by many but it is worth considering retaining at least the first three or four young in some way, either by holding on site or by loaning to friends or other breeders, if possible exchanging for unrelated birds. Any retained birds should be given the opportunity to breed, but holding birds in reasonably sized aviaries, as a backup for losses, is acceptable. Selling birds

blind may result in unsuitable housing for breeding elsewhere so there is nothing wrong in holding on to surplus birds if you feel able to provide only one pair with the conditions conducive to breeding. So many breeders get no further once a pair has been broken because birds to re-pair are no longer available to them.

One option is to hold single sex populations. Gibson states for his Pekins that any number of the same sex may be kept together. Babblers are sociable birds and this is a feasible option. It worked well at Beale Park where the same sex of several species of laughingthrushes lived amicably together, even though the size difference between some of the species was quite marked (Coles).

Gibson however, did experience problems when trying to introduce new blood to his pair of Pekins by switching birds as it generally provoked bitter attacks from the resident bird, either cock or hen, even when the usual mate had been removed from earshot. He does not state whether there was any gap between taking out the paired bird and introducing the new partner. The best procedure to adopt if wishing to split an established pair for whatever reason is to remove the remaining bird and place it and the new mate into a different aviary. If one is not available, then place in adjoining cages for several days before introducing them back into the aviary again. Babblers as a family have a strong bond and if re-pairing for anything other than death of one of the pair, the usurped bird will need to be isolated, both visually and audibly. If there is a choice of sexes, aim to exchange males.

BREEDING SEASON

As would be expected from two species of small omnivorous softbills which become mainly insectivorous when feeding young, successful breeding takes place during the months with the longest daylight hours, mainly because of the time able to be devoted to food collection for young with a high metabolic rate. No breeder reports the nesting of Pekin Robins later than September for birds nesting outside. Tomlins had young hatch in October, November and January but kept his birds inside a large shed throughout the year and extended day-length by means of artificial lighting.

Commencement of nesting outside was usually during the three months of March, April and May for established pairs with May the most cited month. Birds in the possession of Gerald and Ethel Nancarrow (pers. comm.) started in March and this early start is perhaps explained by their locality in the milder, damper climate of south-west England. The three April starts follow no pattern and are recorded as far a field as Hampshire, Cheshire and Norfolk. Two breeders had birds start nesting in July but these were from pairs purchased earlier the same year.

Mesias seem to be in full swing by April but again, there is an early start recorded by a Devon breeder, this time in February. Breeding seems to cease a month earlier than in Pekins with Mesias finishing in August.

Those in Tropical Houses are liable to breed in most months of the year. Gibson recorded his Pekins nesting in nine months of the year in outside aviaries, but the successful rearing of chicks took place in the six spring to early autumn months.

An interesting theory put forward by Gibson who bred both species is that they differ in respect of conditions needed to trigger breeding. Pekins needed the arrival of twelve hours of daylight whereas Mesias started nesting during the first extended spell of

warm weather which, in Portland, Oregon, where he lived, was at any time between February and June. This resulted in a much later start for the Mesias in most seasons. This is an interesting theory and it would be worth making notes as to what weather conditions and day length are prevailing at the time if any breeder is lucky enough to breed from both species.

SEXING

PEKIN ROBIN

For the inexperienced keeper, the simultaneous purchase of stock from one supplier or breeder and through following the various methods given below, should lead to the reasonable assumption that pairs can be picked quite easily. The problem usually arises when one of a pair is lost and an attempt is made to find a mate – the same supplier may have sold all available birds, have only single sex birds left or have a different subspecies available through having received a new consignment of birds.

The yellow throat and yellow-orange chest are much brighter in males whilst females lack the red patch on the primaries. Care needs to be taken when using primaries for sexing as different subspecies have varying amounts present. Likewise some races are brighter in overall body colouration than others. If choosing a pair from imported birds, pick the two extremes – in theory, the brightest should be a male, likewise, the duller a female. One respondent to the census indicated that males have a redder beak and pale legs while females have dark legs and a paler beak. Gibson (1978) points out the problem with sexing subspecies visually in his two pairs ".....and the old cock would pass for a hen of the brighter coloured cock". His original bird was permanently scalped following a fight, hence he was able to differentiate between the two males. It was also a different race to the other three.

Pekins are renowned songsters and it is the vocalisation of the male (or lack of it in the female) which is the most reliable method of identifying the sexes. So much so that Gibson, who seemed to be able to imitate the call of a female, states that he could sex young as early as two or three weeks of age by this means. It seems extremely early and I would welcome confirmation of this from other breeders if possible.

The call of the female is a simple two-syllable whistle repeated up to five times. That of the male has been described variously as tee-tee-tee-tee-tee... According to Gibson, calling females will illicit a response from both sexes if they are separated, thus enabling sexing.

MESIA

Tail coverts are red in males and orange-buff in females. Chicks can be sexed at about a week old (Gibson) just as the tail coverts begin to show – males are rusty red, while those of the female are buff. Booth (pers. comm.) states young sexable at 6-8 weeks presumable by the same method. Sexing presents no problem with this species if this method is used.

According to some authors, males have a scarlet collar, throat and rump with both sexes displaying a red patch on the wings, this being the only red present on the hen. This

may be a dubious method of sexing as in all the skins checked at Tring there was never a great deal to choose between sexes on plumage brightness or colouration. My guess is that pairs may have been of different races.

NEST BUILDING

In his Mesias, Gibson states it to be the male that selects a suitable site and proceeds to loop long grass stems or string to form a substantial base. From this, the female constructed the greater part of the nest. Ali (1983) reports this in both *Leiothrix*. Of the eighteen nests built by Gibson's Mesias, seventeen were made of black horsehair with the occasional leaf or two added to the lining. The only radical departure from this was the one remaining nest, which was constructed out of grass and lined with dried leaves and a few strands of horsehair. Dried grass formed the main construction material, along with the occasional dried bamboo leaf incorporated in all nests built by his Pekins. The rather sparse lining was of either horsehair, sisal twine, string or, most commonly, fine grass. Other materials such as cloth, paper and feathers were never used in the fifty or so nests built by his Pekins.

Moody (1944) describes the nest as a deep cup, partly suspended from ever-hanging twigs, almost basket-like in appearance and constructed entirely of sedge grass with the odd last year's beech leaf or two.

Pekin nests measured by Gibson were 5.75 cm inside top diameter and about 5 cm deep. Brooding birds usually only had their beak and tail showing.

Many nests built by respondent birds were largely of coconut fibre, with straw, hay, dried grass and sisal fibre also used. Several pairs incorporated some wool and cotton wool into the lining. As with many species, nests will be built with anything suitable that is available with coarse material used to build the shell and softer items for the lining.

Six breeders, including Gibson, had problems with nests collapsing and either eggs or young falling out. Two nests were gently lifted and placed inside a small wicker basket, which in turn was securely wired. Others were wired beneath to stop them slipping further while Gibson shored up the nests of his Mesias with so many twigs that subsequent nests were built on these without the additional need for support. None of this was reported as upsetting the nesting process. Newton (1989) had a Pekin nest collapse to such an extent that part of the nest and eggs had to be removed temporarily and placed under a heat lamp while he made repairs. A four-pointed cup was manufactured out of electrical wire and the remains of the nest, plus that under the heat lamp were placed back and tied to the original site. The three eggs were replaced and the female continued to incubate. One chick was reared successfully.

Care needs to be taken in providing enough nesting material as there could be a problem, as experienced by Hinze (1988), in that other occupants may destroy other nests by collecting material for their own. In his case Lavender Finch and Zebra Finch, both of which started to collect the dry grass from the Pekins nest. Zebra Finches in particular can be very demanding in their need for nesting material because of their habit of building nest upon nest until finally settled.

Nests can be built quite quickly with Mesias taking three or four days to complete one when in full swing but as is often the case with cup nesters, the first of the year takes

longer, as would those interrupted by inclement weather. A pair of Pekins belonging to Jean Frost built one nest "overnight". Time to refurbish a previously used nest was not noted.

The same nest can be used more than once in some instances. Although quantitative data is lacking, it appears that a nest is more likely to be used again if viable young have been produced. It seems more pronounced in Pekins than Mesias but this may be a reflection on the larger number of records for the former species. However, if birds are going to use previous nests, it figures that those that have proved successful will be used for the simple fact that all aspects for rearing a family have been met at that site, be it food, security or whatever.

NATURAL NEST SITES

Gibson had numerous nests from his Pekins over the years and describes them as following the same basic pattern – a loose, deep cup suspended from suitable stems. The preferred support, he goes on to say "is an even-sided triangle of horizontal twigs of about 12.5 cm long or a similar arrangement from which the nest can be slung in concealment". He does not say what plants grew in his aviaries housing the Pekins but recommends "vines and evergreens". His Mesias built in "bushes and plants" at a height of between 1 m – 1.7 m above ground, mostly in hollyhocks but also slung between the stems of *Helianthus*. Ali reports Mesia nests in the wild generally to be within 2 m of the ground with several as low as a couple of centimeters.

Other natural nest sites for *Leiothrix* included fir bushes, conifers, Shrubby Honeysuckle *Lonicera nitida*, cotoneaster and ivy-covered stumps. Height seems unimportant and is heavily outweighed by the need to feel secure. Pekins in particular are willing to nest fairly low down. If birds are happy with their nest site, they may well use the same one again or, if not, try elsewhere.

Ledges are sometimes used by Mesias as reported by three breeders.

ARTIFICIAL NEST SITES

Artificial nest sites can be created and Pekins in particular seem willing to build their nests in wicker baskets and, to a lesser extent, canary nest pans. At least four breeders report rearing Pekins in wicker baskets and one successfully bred in an open-fronted nestbox. It must be remembered that feeling secure is of prime importance to any breeding bird and simply sticking a basket in a fairly open situation is unlikely to induce much confidence in potential breeding birds. The best way around this is to provide cut greenery in which the basket can be placed. By far the best plants to use are conifers, for they remain green for long periods and even when they turn brown, will still provide adequate cover. Be sure however, to avoid Christmas Tree types as they soon drop their needles. The infamous *C. x leylandii* is ideal.

PRE-BREEDING PLUMAGE CHANGE

There is no discernible change in plumage colour at the onset of the breeding season but change in the colour of the beak has been noticed by several. Mesias lose the

blackish tip to the bill, which becomes ivory according to Gibson while Pekins lose, the blackish base to the bill which becomes all red, being reddish-orange at other times of the year.

DISPLAY

Little seems to have been recorded in the way of display behaviour from either species. Simmons (1961) records a single display sequence, which he observed only once during seven years of keeping Pekin Robins. It occurred during a thunderstorm and is described thus "My current pair were clumping in a small, dead fir tree. The male 'danced' rapidly round and round the female, swaying his head, which was pointed up, and the front of his body from side to side, showing off the throat and breast colours. He did ruffle his feathers to enhance these,his head feathers were sleek, indicating a measure of fear [excitement?]. As he dodged about thus, he displayed the pattern of both wings at the same time in a striking lateral posture, leaning towards the female, lowering the near wing and inverting the far wing, still largely folded, so that it showed over his back. This posture varied from moment to moment as the male endeavoured to keep in front of the female in a lateral position. She in turn either seemed to ignore him, or hopped away or even pecked at him. When on the ground, the male apparently tried to mount the female but, as she avoided him, a kind of "leap frog" resulted. Of course the male may have been attacking the female for I was not able to establish whether his intentions were courtship or hostile ones".

No other reference can be found on the display of Pekin Robins. Even Gibson does not mention it in his exhaustive account covering the species. They are secretive birds and it is likely that it is rarely performed away from dense cover. Equally, because of the males' superb song, vocalisation is likely to be an important factor.

Mesias, being slightly less secretive by nature, have been witnessed displaying on several occasions but never in as much detail as that just described for Pekins. Lee states that the male would carry a piece of hay or similar in his beak and dance along perches with his wings drooped and spread out. When the female approached he would fly to a ledge and she would follow. As this is the location where the nest was ultimately built, this may not necessarily be a pre-mating display but rather the male trying to coax the female to inspect a prospective nest site. Gibson records similar behaviour with the male standing bolt upright, with head feathers raised. Both sexes then raised their wings above head height with the hen sometimes holding grass too. They would then slowly bow heads and bob tightly folded tails.

MATING

As with display, this act, despite both species being frequently kept and bred, especially Pekins, is rarely witnessed. Rivers (pers. comm.) describes it in his pair of Pekins as follows "Male jumps over the female, from side to side whilst she presents herself to him. Both sexes utter chattering noises". As brief a description, as this is, there seems little else recorded other than that noted by Simmons under the last heading. In this he states that after a period of displaying, the male tried to mount the female but when she avoided him what followed couldn't be interpreted positively as either courtship or

aggression. It is, however, quite possible that what Simmons witnessed was an attempted mating by a male to a female that was not yet receptive. Various keepers describe mating in Mesias as "normal bird copulation" lasting two or three seconds.

CLUTCH SIZE

Clutch size recorded for Pekins varies between two and five, with one breeder recording both ends of the scale. Three or four seems to be the normal clutch that can be expected. Two is at the low end, and the cause of these small clutches is likely to be that the females were still attaining full breeding condition or they were on their last clutch of the season and starting to lose condition. Other possible causes are young or old birds, and eggs broken or predated. Clutches of five eggs are reported by several keepers and would appear particular to their hens and not a sporadic occurrence across all pairs kept. Diet can reflect on clutch size in other species but does not generally equate to an increased number of hatched and reared chicks.

The personal exception to this was when a pair of White-naped Cranes, normal clutch two, laid, hatched and reared three young. At Beale Park, the same year, a pair of Demoiselle Cranes laid three eggs but reared their customary one. This increased clutch size was brought about in both pairs by a change of diet prior to the breeding season to a special formulated diet for cranes. The larger clutch size did not appear the following year despite the adults still being fed the same pre-breeding diet.

The diets of those Pekins recording five egg clutches, however, do not significantly differ from others except, perhaps, that livefood seems to be fed more regularly as part of the basic diet as opposed to during the breeding season as with most others. There is an exception though with the keeper offering the largest variety of livefood not recording five.

Two respondents, Bradburne and Tomlins, indicated clutch size might decrease during the year. Bradburne gives a clutch size as two or three for late nests and Tomlins notes likewise in detailed data given for 1995/96 breeding seasons. Four clutches were laid by his Pekins in each of the two years, the first three clutches of each season consisted of three eggs while the fourth comprised only two. Both sets were fertile, and all hatched but none were fully reared. Interestingly, those of 1995 hatched November 8th, the latest recorded, although his pair were kept inside. Gibson reported a pair of his Pekins sitting on two eggs outside during November in his aviaries in British Columbia.

Clutch size for Mesias seems to be three or four, with no captive records of five as in Pekins. Ali, however, records clutches of five in the wild but gives their occurrence as rare. Gibson (1979) gives three eggs as consistently being laid by his pair for 18 nests while respondents to the questionnaire mention three or four. Putt (pers. comm.) records three nests, each containing four eggs while the fourth nest contained only two eggs.

CLUTCHES PER YEAR

The number of clutches per year depends on several factors. Two breeders report imported Pekins obtained at the National Cage Bird Exhibition in December managing at least one clutch the following year when acclimatised and placed in a planted aviary.

Established pairs of Pekins manage at least three or four clutches a year with at least one pair achieving only two. Coleman (pers. comm.) expected only two. If some success is achieved in all broods, three clutches should be the maximum reared from. However, failure often does not mean the end of nesting and Mesias are recorded as having as many as six attempts in a season, whilst some Pekins managed seven, some of which were successful.

A prolific pair of Pekins in the collection of Jean Frost (1999) reared a total of eight chicks which turned out to be four pairs from five nests (2.1.2.1.2) with a further three chicks thrown out during a productive year in 1999. After the third brood she made efforts to stop them breeding by taking away as much material as possible but still they managed to build and lay in a nest constructed overnight. She relented and let them continue. However, after the fifth nest, she destroyed as they built. Regrettably, the hen then became egg bound and only just survived following some intensive treatment (see Health).

Some birds can be persistent and seem to conjure up a nest from nothing and in the most unusual places. If there is any worry about a bird's well being through repeated breeding, removal to another aviary or large cage for a short spell will generally suppress the urge to nest again. Never be tempted to over-breed.

Be sure to remove both birds and if males persist in either nest building or continue to pester hens, separate the sexes but do not under any circumstance take the hen out of the breeding aviary then put her back after only several days. This is asking for trouble and likely to result in a very stressful period for the hen.

Both Gibson's Mesias (18 clutches) and Pekins (50 clutches) give an idea of how prolific these species can be if given the right conditions. In his original pair of Pekins first year of laying (1974), a total of 7 clutches were laid, totalling 26 eggs (3,4,4,4,3,4,4) of which 23 hatched. Although he failed to mention the number of chicks reared, he does state later on in the article that "chicks were reared from two nests in 1974".

The biggest incentive to re-nest is egg or chick failure.

TIME BETWEEN CLUTCHES

When established as breeding pairs, the time between clutches can be relatively short. Gibson's Pekins laid fifty clutches over the years and he reports his hens laid again when chicks were between 14 - 20 days old. He does not mention the span between failed nests but it must have been fairly short because in a single season, one of his pairs laid seven clutches. Four respondents Pekins started to lay again between seven and ten days after chicks fledged. Two other respondents give four and ten weeks respectively, but these are quite lengthy gaps and I suspect other elements came into play to cause this.

Several breeders of Mesias give lengthy spells between clutches of five to twelve weeks, but two others equally report a much earlier recommencement of nesting. One breeder actually gives this as a possible cause of loss of chicks from the previous round through neglect by the parent in not continuing to feed their chicks in preference to putting all their efforts into nest-building. It seems that some birds are eager to re-nest and it might, in some instances, manifest itself into a problem whereby chicks are harassed or neglected. If this happens it may well be worth removing for at least a week any new nests that are started.

Weather, will of course play its part in dictating how quickly birds will lay again. A spell of wet and cloudy weather will often delay the process for some time.

NEST INSPECTION

Leiothrix, like many babblers, are tight sitters and usually a visual check is all that is needed to see that things are alright. Sitting is at its tightest when eggs are being incubated and for the first three or four days after hatching. After this period, the parents will usually vacate the nest.

Gibson's Pekins proved extremely steadfast sitters and would only leave the nest when almost touched, a resolve reported by several others. Both species chatter angrily when nests are approached or disturbed.

Gibson inspected his Pekin nests daily, a risk not many breeders seem willing to take, but he goes on to mention the birds objected little at these daily intrusions once they became accustomed to them. Several other breeders who checked the nests of their Pekins regularly also mention no objection shown and it is likely that birds will become used to such intrusions if they are frequent and no harm is done to the nests. All other respondents register that some form of protest is made when the birds are disturbed. Jerrard (pers. comm.) inspected nests to get a date for the first egg and again five days after the first egg to ascertain clutch size.

Gibson witnessed in two male Pekins a type of distraction display. It took the form of the birds being found sprawled on top of a bush with wings spread, legs dangling and beak open. On close approach they would fly away. He noted this behaviour when first starting to inspect nests but it soon stopped with time and was never witnessed again.

Desertion was not mentioned by any breeder through nest inspection and Gibson had it only happen once and that by an incubating female when the male with two fledged chicks were removed. From that point on, the pair were left together and it did not occur again.

Because of the consumption of large quantities of mealworms by a Chinese Bulbul and a pair of Heck's Grassfinch, Flory (pers. comm.) had cause to capture these birds to remove the competition for livefood. Despite having chicks several days old, his hen Pekin sat tight throughout the process.

EGG LAYING

Eggs are laid on consecutive days by both species of *Leiothrix*. Gibson reports that most eggs produced by his Pekins were laid before 9 a.m.

BROODING DUTIES

Where this is mentioned, all records report the duties of incubating eggs and brooding young is shared by the sexes in both Pekins and Mesias. Hens usually brood at night, although Tomlins gives the honour of night-time duties in his Pekins to the male. Most males perch nearby or occasionally on the edge of the nest. Gibson records his male Mesia as sometimes sleeping in the nest squeezed between the hen and the rim.

Both sexes of Pekins take their share during the day and seem to relieve each other at half to two hour intervals, although females can manage up to three-quarters of the daytime duties. Mesias seem to be a little more reliant on females performing a greater share. Gibson states his male Mesias relieved the hens for up to ten minutes at a time but usually, only just long enough for her to feed, about five minutes and at 30-40 minute intervals. As incubation progressed, males tended to sit longer and he did time one male sitting for 47 minutes, in short spells, during a period of 1½ hours. Carnell indicates his hen Mesia to do all the incubating, while Putt and Booth (pers. comm.) stated their females incubated at night, with their males exchanging at regular intervals during the day.

EGG COLOUR AND SIZE

Mesias:- Off-white with largeish reddish-brown spots at the large end. The spots range from few in number to a heavy ring around the widest part of the egg. Eggs laid by Gibson's pair averaged 22.75 mm x 16 mm. Baker (Ali) gives the average of 200 eggs as 20.9 mm x 16.1 mm for wild taken eggs.

Pekins:- A comparatively large off-white egg with the faintest of greenish-blue tints. The eggs are sparsely marked with large brownish-red spots. Baker (Ali) gives 21.9 mm x 16.1 as the average for 200 wild taken eggs.

EGG WEIGHT

Mesia:- 3.25 g (one egg)

INCUBATION PERIOD

Mesias:- Gibson states hatching time is thirteen days from the time the hen commences sitting. He does not however state when she starts to incubate but Putt gives from the third egg and Carnell the fourth egg with incubation lasting 12-13 days.

Pekins:- Hatching time is accurately predicted reports Gibson, by adding twelve days to the date of laying of the second egg. Birds incubate from the first egg but, in four egg clutches, the first three hatch on the same day. In a clutch of three eggs, two will eventually hatch on the same day and the last on the following day. His Pekins laid before 9 a.m. with a few exceptions and individual eggs varied between 11½ and 12½ days incubation.

Respondents give incubation as 12-14 days (mostly 13-14) which is not far removed from Gibson's data. There is evidence to suggest that incubation times within a clutch do vary to enable more than one to hatch at the same time. Incubation starting with the second or third egg is reported by two respondents.

On hatching, shells are deposited at a point farthest away from the nest.

LOSS OF CHICKS

Major reasons for loss of chicks while still in the nest are either insufficient livefood or unsuitably sized livefood for the age of chicks. If other species are kept in the same aviary, they may also be consuming livefood, so what may be considered ample provisions for two or three *Leiothrix* chicks, may not actually be the case. Choosing other aviary occupants very carefully will also help, bearing in mind that even some seed-eaters will take certain types of livefood even if not breeding. Most become familiar with mealworms so offering at least some crickets and waxmoth larvae may help. The shortage is most likely to be associated with keepers being away for long periods during the day and thus unable to check and replenish any shortfall. Placing a bowl of livefood near the nest may help, although *Leiothrix* are not particularly aggressive in defence. Planting to attract insects may also help to span the times between topping up livefood. Two breeders report loss of chicks through nest collapsing.

Upon fledging, the primary cause of loss seems to be accidents. Gibson reports all 1976 fledged Pekins to have died from drowning, a preventable cause. Rather surprisingly, there are four other reports of Mesia and Pekin chicks drowning. However, simply providing a small amount of water in the bottom of a steep-sided dish in no guarantee of safety, certainly in the first few days after fledging. Young *Leiothrix* are not very mobile at this stage of their development and dishes even 2.5 cm deep may prove quite an obstacle. Even with the shallowest amount of water in, chicks may soon become waterlogged.

A concrete pond with gently sloping sides is always the better option as the birds can hop to safety without too much difficulty. Water should be kept to a minimum for the first week after fledging. Gibson also reports seeing a Pekin bathe at 20 days old after watching its father but even so, water should be kept to a minimum for about three weeks after fledging (32-35 days old) or until they're mobility is considered ample. Care must be taken in hot weather that water does not evaporate completely. Chilling through bathing or following a drenching after rain may also be a cause.

Broken legs, wings, and beaks are also reported with chicks most susceptible, not immediately on fledging, but after four or five days as they become more aware of their surroundings and more liable to panic if disturbed.

Even when everything is in place for what may seem a successful rearing, total mortality of most softbills is quite high with the highest percentage occurring inexplicably up to four days old, despite adequate livefood and conducive weather conditions. In both species, breeders report losing young, once fledged, at between 14-18 days just as the parents are starting to nest again and put it down to neglect. Gibson reports that after six hours without food, chicks at this age start to deteriorate very fast.

HAND-FEEDING

I can find no trace of an attempt at hand-rearing of either *Leiothrix* from the egg. Gibson augmented his Pekin feed while still in the nest because, although he had not experienced rickets, he feared it might become a problem. At between two and five days old his Pekins were fed scrambled egg mashed with either margarine or butter and made quite moist with milk. Once their eyes were open he found it more difficult to hand-feed

as they would only accept food from their parents. To overcome this, he would stand unseen beneath the nest and tap on the side. When the chicks popped their heads up with mouth wide open, he would quickly put some of the food in.

He only persisted with this technique in his early broods, chicks thereafter being left alone with no sign of any deficiency. The actual problem of rickets seems not to have been recorded for either *Leiothrix*.

DEVELOPMENT AND CARE OF YOUNG

The most detailed accounts of *Leiothrix* development are those by Gibson in his articles covering both species and this section relies heavily on those two excellent articles.

Chicks of both species are the typical pink of newly hatched chicks, blind and covered with sparse grey down and have a pinkish-orange gape. By five days, greyish feather quills are poking through and when chicks leave the nest at between ten and fourteen days they are fully feathered, but duller versions of their parents with tails about 1 cm long. Bills are much duller. At this stage the chicks are about half adult size and develop rapidly, being indistinguishable from their parents at three months of age.

On leaving the nest, the period of which can be either weather or disturbance dependent, chicks of both species usually stay put for several days, moving as little as possible. The capability of flight at this period is very limited and is not undertaken unless forced. There is a clear preference to scramble about amongst shrubbery, which they are able to do with surprising ease.

Livefood constitutes the largest part of nestling diet, especially in the early days. Feeding commenced within two hours of hatching in Gibson's Pekins. Bisham records his Mesias swallowing all food for four days and feeding chicks by regurgitation, as did Gibson and Jerrard for the first two days with their Pekins. Gibson mentions insects being picked into small pieces before swallowing and regurgitation whilst Dummert observed limited regurgitation in both species (Barnicoat), presumably during the early stages of rearing. Thereafter food is fed whole and pushed down the throat as the chicks beg. Gibson's Pekins started their next clutch at between 14 - 20 days at which point the male would only offer food at which the chicks were expected to grab. This action is presumably meant as an encouragement for the growing young to start picking at food for themselves.

Nests are kept particularly clean during the 10-14 day period chicks are in the nest. Because of this cleanliness and constant removing of droppings until chicks leave the nest, Gibson was of the opinion that this may have led to the consuming of dried droppings at other times of the year which his Pekins were seen periodically to do.

Faecal sacs, if not swallowed, along with eggshells and small dead chicks may be deposited as far away from the nest as possible.

The loss of a parent while nesting is rare, but Hinze lost his hen Pekin to egg-binding before the young were independent. The chicks continued to be fed successfully by the male and reached independence.

SEPARATION OF CHICKS

The time young are left with their parents once independent seems to follow no particular pattern and most available options are employed by the various breeders. Tomlins left three young (1.2) in with their parents with no animosity shown during the three years until both parents died. But he does go on to say that they did not breed again because he believed they required only one pair per aviary to breed, the scenario which prompted the breeding in the first instance. Gibson over-wintered a young pair of Mesias with their parents. The following year, the young male gradually began to assert his dominance to the point where, after several skirmishes between the males, the adults were removed for their own safety.

Two respondents stated they took Pekins away once they were confident young were independent and well able to fend for themselves because males would kill the youngsters, although neither specifically stated young had been killed. Two respondents separated young simply because of the livefood that would be needed for the extra birds. Jerrard removed young when they reached the age of twenty-six to twenty-eight days. Gibson separated them at twenty-four days old. Six breeders left young Pekins in the same aviary until either the following spring or until they were either sold or exchanged. Fielding bred from both species in the same aviary.

Newton (1989) records slight harassment by parent Pekins of a fledged chick when the next brood hatched. This was periodic and without apparently causing much harm for it did not become too serious.

Rishman (1989) states his young Mesia remained dependent on its parents until almost six weeks old but probably started to feed itself well before that! It seems that Mesias are reliant on their parents for a longer period than Pekins and therefore should correspondingly be left longer. A minimum of six weeks is recommended unless trouble is experienced earlier.

Between twenty-four and forty-two days for the separation of young *Leiothrix* from their parents is a short span of time in which they must become accustomed to the ways of aviary life. Making this crucial time as easy as possible by giving them accommodation to themselves or with species that are not liable to dominate or compete with them for anything, is important. Provide plenty of cover and adequate food and in as wide a variety as possible with plenty of their favourites if they show a preference. Livefood is generally a safe bet. Do not undo success by carelessness through lack of thought!

SEXUAL MATURITY

Leiothrix will breed at around twelve months old. But as is pointed out by Jerrard who bred from both species, because of their long breeding season, birds raised in May/June may breed the following years while those reared in August/September may not, missing the following season before starting early the next. Many breeders seem to dispose of young so quantitative evidence is lacking in many cases. Gibson had both Mesias and Pekins lay at ten months old. The Mesias were in the same aviary as their parents, which they eventually forced the removal of to another aviary. This pair went on to rear young but no mention is made as to whether it was from this first, or subsequent

nests that young were reared. He does go on to say that three generations were raised in three successive summers. No mention is made of the outcome of the Pekin eggs so I can only assume they did not produce chicks. At least three other breeders report success from year old Pekins.

Putt had a cock Mesia nest for the first time at 10 months old, paired to a four year old hen. Carnell bred from a one year old hen Mesia.

BREEDING VIABILITY

With a maximum life-span of around ten years, it figures that breeding viability of *Leiothrix* is not going to be particularly long. Pekins seem to have a maximum of five years as reported by three breeders while six others have bred them for three or four successive years. Bearing in mind the number of isolated breedings with other softbills, for nine breeders to have hatched or reared Pekins for a minimum of three successive years shows how adaptable and successful these birds can be. With a breeding co-ordinator to relocate young birds and to pair up singletons, Pekins are one species of softbill that could easily become established (See Conservation and Breeding Programmes).

Mesias on the other hand lack the number of breeders but there are a few impressive accounts. Carnell owns a wild caught pair in which the male is at least seven and the hen a minimum of nine years old. Although they failed to rear in 2000 they have hatched or fledged young for six years.

Of the two species, Pekins seem to breed more readily, at least judging by the number of replies to my questionnaire and to the annual Foreign Bird Federation Breeding Register. Other than several breeders who report second generation breedings with their birds, subsequent generation breeding seem not to be recorded. Mesias fared better in the past with Gibson recording three generations while Mats Tell in Denmark succeeded to at least five generations.

LONGEVITY

Both Pekins and Mesias are comparatively long-lived birds because of their adaptability to captive life once established. The oldest bird of known age that I can trace is a hen Pekin owned by Woodley which he bred in 1990 and was still alive in June 2001, having laid but broken the egg. Two keepers own wild caught Pekins that are eight and nine years old respectively while a high proportion of the rest are between three and six years old. Other than Woodley's hen, the oldest recorded captive bred Pekin is six years old.

A nine year old, wild caught hen Mesia belonging to Carnell was 10 years old when she hatched eggs, but failed to rear young in 2001. There seems to be no record of any substance relating to the age of a captive bred Mesia.

HYBRIDISATION

Softbills will hybridise but thankfully it is not a common occurrence and in the case of *Leiothrix*, I can trace only two references.

A hybrid pairing involving a male Mesia and female Pekin reared young for Hervouët in the late 1960's.

In the aviaries of Ron Cleaver three young from a Pekin Robin x Blue-winged Siva were produced after one bird from each pair were lost (Barnicoat,1975).

Possible candidates amongst avicultural subjects for hybridisation with *Leiothrix* are members of *Minla* (which now includes *Siva*) and *Liocichla* and it would perhaps be advisable not to keep opposite sex singletons of these genera with either Pekins or Mesias.

MARKING FOR IDENTIFICATION

Rishman states his Mesias were upset when the chicks were handled but unconcerned by the rings once on, while Gibson was of the opinion that because of the meticulous cleanliness of Pekins, ringing chicks would be a risk which he was not prepared to take. No other mention is made to the problem or otherwise of ringing but if a breeder has had a problem I would be interested in hearing.

Details of ring sizes for *Leiothrix* are available through A.C. Hughes at www.achughes.com.

BEHAVIOUR

In terms of modern classification, behaviour plays little part in the overall scheme of things. However, even with the DNA system of classification, each family is still liable to have a large percentage of characteristics shared by members within a genus and family, each or combined making them unique. Babblers are no exception and have a number of features that are fairly distinctive to them. It is not my intention to cover these in great depth within this chapter as individual traits are given under the relevant section but there are several areas which are worth touching on that do not have an obvious place elsewhere and which may be of interest.

Babblers as a group have been studied in great depth by very few. Simmons (1961) kept and studied Pekins for a number of years and published his findings in the Avicultural Magazine, from which these notes draw heavily. They also include his studies on a number of other babblers, mainly from observations at London Zoo.

HEAD SCRATCHING

The area around the head is scratched with the claws of one foot while gripping a perch with the other foot. Two methods are employed; indirect method whereby the wing is slightly lowered and the leg brought between body and wing and over the shoulder. The direct method involves lifting the foot straight up without any wing movement. Most

Passerines head scratch indirectly but at least eight genera of babblers scratch directly, including *Leiothrix*.

CLUMPING

Both *Leiothrix* are social birds and will sit close together (clumping) all year round, appearing as one body mass with the appropriate number of beaks, legs and heads. Odd birds will even seek out the company of other sociable species to roost alongside. So strong is this instinct that even single sex birds will do this. Several reports indicate that if singletons of both *Leiothrix* are kept in the same aviary, they will also clump together.

MUTUAL PREENING

Babblers are great mutual preeners and I have seen it in fifteen species of laughingthrushes. Simmons witnessed it in both Masked Laughingthrushes and Pekins. Mutual preening mostly involves the head area with the bird being preened remaining perfectly still as if in a trance while its partner preens the head, throat and chin. While clumping one bird will indicate its wish to be preened by giving the other a short preen about the head then moving his head into position by way of invitation.

The possibility of vent-preening may exist in Pekins at least. Simmons saw this behaviour in Masked Laughingthrushes quite distinctly and later twice noted a female Pekin assume a posture that invited the male to preen her ventral area. She stretched upwards her head and tail and fluffed out the feathers around her vent. She then remained motionless but in both cases the male failed to respond.

OILING INACCESSIBLE AREAS OF PLUMMAGE

Many birds oil their plumage to keep it protected. They first stimulate the oil (Uropygial) gland with the beak. Again, babblers seem to have a different procedure of distributing oil to the head, the most difficult area of the body to reach. Simmons states his Pekins "scratch the bill merely to distribute the oil on it. They then simultaneously rub the bill and the head on an extended wing and the wing against the head, all at great speed, alternating from wing to wing and, at full intensity, spreading the tail and thrusting sideways to steady the wing by pressing against it".

USE OF FEET IN FEEDING

This behaviour, so well adapted in some Passerine families, is not widespread amongst babblers. Some forty years ago Simmons witnessed it in only four genera *Leiothrix* (present subjects), *Minla* (Blue-winged Siva), *Heterophasia* (sibias) and *Garrulax* (laughingthrushes). As most of his observations were on captive birds, there were not the numerous other species available in captivity at the time of his studies as there is at present and consequently there is the possibility it may be more widespread.

Two methods are employed when holding food. Clamping by which the food is held against a perch with the front three toes while the hind toe grips the perch. Grasping

involves holding the food with one foot while grasping the perch with the other. *Leiothrix* use the former method.

ANTING

Although the term is self-explanatory, the reason why birds "ant" is not completely known but likely to be done in the cause of feather maintenance, either helping to elevate an ecto-parasite burden or as a deterrent against attack. Other theories have been put forward relating to this behaviour and the literature is littered with accounts, mostly of captive birds and, admittedly, using items other than ants, but all are likely to help in discouraging parasites. Smoke, lighted cigarettes, mothballs and various insects are amongst reported items used.

On the several occasions I have witnessed anting with ants, vigorous preening followed on all occasions and in one instance, a prolonged bathe ensued; both of which may assist in the removal of parasites after anting.

Anting behaviour seems to be restricted solely to Passerines and of these, members of the *Corvini* (Crows, Jays and Magpies) and *Timalini* (Babblers) seem to participate the most. Both *Leiothrix* ant and in experiments undertaken by Simmons (1961) would use workers of the Wood Ant *Formica rufa*, the largest British species. Other ant species recorded as being used by birds as a whole also belong to the formic acid-producing species of the *Formicinae*. These include Robber Ant *F. sanguinea*, Slave Ant *F. fusca*, Jet-Black Ant *Lasius fuliginosus*, Garden Ant *L. niger*, Brown Ant *L. brunneus*, Hill Ant *L. flavus* and Lawn Ant *L. umbratus*. Stinging ants are not used.

Gibson (1991) has observed both *Leiothrix* using plant material to "ant". A wild caught hen Mesia was seen to pluck a sprig of Nasturtium, and adopting the anting posture, scrub herself vigorously with the plant for "two or three spells of between 10-15 seconds each". He also witnessed this behaviour in a young, captive bred hen Pekin but this time, a leaf of an *Actinidia* vine was used. Nasturtium plants have a peppery-flavour, and the leaves are frequently used in salads because of this, so it seems quite feasible that it was used for the same purpose as ants. As for the *Actinidia* leaf, Gibson doesn't state which species it was but goes on to say that it had no taste but that the common factor may have been that both sprigs were "sappy". If the use of leaves is more common than recorded (no other reference can be found) it may be the young Pekin had not learnt which plants to use, or that they were not available in its aviary. Gibson states "This phenomenon (plant use) must be a trait of the *Leiothrix* genus".

Two types of anting have been reported in birds. The least opted for method is indirect anting whereby birds simply allow the ants to swarm all over them while on the ground. The most frequent form involves the picking up of ants and rubbing them over various parts of the plumage, coating it with the formic acid exuded by the ant. The posture adopted by both *Leiothrix* seems to be the same - a high, stretching stance with individual ants vigorously rubbed on the wings. They may be taken from either on the ground or from foliage, mostly the former. Gibson's Pekins anted by "rubbing the ant violently on its feathers either directly on the body under an extended wing, or on the outside of the primary feathers of an outstretched wing" These birds would then eat the ants rather than discard them.

CALLS

Mesias have a variety of chirps and whistles with which they communicate throughout the year. The breeding song is a five-note call. A shorter, softer version is used when sexes are separate. Females reply with a high-pitched double trill. A quiet "churr" is often made when in dense vegetation. In spring and autumn, the cock shortens his usual five-note song to either three or four notes. Gibson also notes that males as young as six or seven weeks make concerted efforts at this song.

The call of a male Pekin is an oft-repeated tee-tee-tee... while the hens call is a two-syllable whistle repeated three to five times. Other hens will respond immediately with the same call while males will reply with a short burst of song. As with Mesias, Pekins have a quiet chirping call uttered when in dense cover.

The males of each of two unidentified races of Pekins kept by Gibson uttered slightly different calls. The slightly larger and brighter cock had a louder and marginally lengthier call.

Both species share an angry chattering utterance when alarmed and an explosive alarm call when chased or caught, even when young.

Some years ago, a male Pekin in the collection at Padstow Bird Gardens learnt to mimic a male Blackbird, only much softer. This is the only record of mimicry in either species I can trace.

TAMENESS

Under normal conditions and in times of stress both *Leiothrix* will seek out the security of dense cover but with patience by the owner, they can become quite confiding. Pekins in particular do tame down very well, even to the point of taking food from the hand. Offering livefood greatly assists steadying birds.

HEALTH

Like many of the babblers, both Pekins and Mesias, are adaptable birds and settle well into a captive environment if their basic requirements are met. Both are regarded as ideal birds for beginners and this is in no small part related to their general toughness.

Basic needs are covered under the appropriate headings but a good diet and heavily planted aviary will benefit their health immensely by providing the nutrition for these active birds and the cover required to reduce stress if they feel threatened.

Like all stock, problems will arise from time to time although from all the literature to hand, surprisingly little is noted. There is, however, a paucity of post-mortem reports available, even amongst UK public collections where a request in the Passerine Taxon Advisory Group newsletter failed to provide any. However, Cathy King of Rotterdam Zoo provided two for Mesias, neither of which showed any malady to be involved in their demise. One, an adult, died of injuries sustained to a leg while a two week old chick died of impaction through consuming nesting material.

Coccidiosis is a problem that is likely to be more widespread than suspected. Gibson noted its presence in over 200 caged and wild birds in his area of Canada. He

identified the genus *Isospera* that does not respond to normal sulphur drugs used to treat pigeons and probably others with the related *Eimera*. However, since his article was written not only has the classification of parasites seen some change but the manufacture of drugs to combat internal parasites has progressed apace. Faecal samples should be sent to a vet or Veterinary Investigation Centre for analysis and treated with the aid of a vet.

Infestation is likely to occur in overcrowded and unhygienic conditions, probably at point of capture holding facilities. Burdens do decrease if kept clean, especially if drinking water and area where they spend most of the time are given particular attention.

Four respondents worm their birds routinely at intervals of one month, six months (2) and yearly although only one, Blanchard (pers. comm.), reports his birds as actually having had worms. He treated gapes successfully with Panacur. Cornell does not mention the preparation he used but Panacur and Harker's Worm Powder are the other two anthelmics used by respondents. Several products are now on the market and while worms may not trouble *Leiothrix* greatly, there is no doubt that worming at least twice a year, in February and August, will help to reduce any risk. Flubenvet (Jensens Ltd.) sprinkled over, or mixed in with food, is a good one to use and can be obtained from stockists of Farming supplies. It comes in tubs and although expensive can be used to treat most softbill species. The author has used it routinely for laughingthrushes, starlings and a host of other non-passerine species quite safely. It must be noted that few preparations are produced specifically for softbills but those mentioned are relatively safe. If in doubt consult a recognised bird vet before proceeding.

I can trace no specific disease recorded in *Leiothrix*, mainly because fatalities are generally not investigated further but injuries seem to crop up from time to time. Broken wings and legs mainly which can result from any number of causes - cats and sparrowhawks being mentioned by several.

Gibson had problems when mealworms were fed, particularly in the early part of rearing when the male fed whole mealworms to chicks that were only three days old. Two chicks died of ruptured intestines. He put this down to inexperience and it was not repeated the following year when the adults became more experienced. Rivers reports that in 1999, after two abortive attempts, his Pekins successfully reared three very healthy chicks fed on his usual diet. The next round, despite being offered a wide range of food items, the parents insisted on feeding mealworms and nothing else at all. After withholding mealworms in the hope that they would feed something else, he again provided mealworms after losing one chick. The three remaining chicks matured very quickly and fledged at 12 days. They remained with their parents until 10 weeks old when they were placed in an adjoining aviary. But these babies looking a picture of health would still only take mealworms. At 12 weeks they appeared to develop bloated stomachs and two weeks later were all dead. They were not post-mortemed but on opening them up, their livers were so large as to almost fill the stomach area.

The cause of death in a two day old chick from Gibson's pair was a blockage of the exit from the stomach by a piece of quartz measuring 5 mm x 3 mm x 1.5 mm. Thereafter he provided grit and subsequent chicks examined from two days old contained small pieces of grit.

Contaminated food also caused losses in some of Gibson's Pekin chicks. The intestines proved full of *Bacillus*. Gibson's diet contained a large percentage of items

prone to contamination (e.g. scrambled egg) and the problem was solved by freshly preparing the food as needed or by keeping it refrigerated.

Egg-binding has been recorded by Jean Frost in a female Pekin after having laid five clutches, of which some young were reared from each. The hen was found huddled up and almost dead and placed in heat and administered Calcivet (Pet Care Ltd.) and glucose via a crop needle. This was repeated several times and within two and a half hours the hen was perched with an egg on the floor. Isenberg feared it in a female Mesia and administered "sweet oil" and she recovered but he does not say whether she passed an egg. Hinze (1988) had a hen Pekin die of what was believed to be egg-bound peritonitis and later found, after consulting a number of friends, that five Pekins had suffered egg-binding, two with fatal consequences.

Many keepers give additives in water or sprinkled over food to increase vitamin and mineral levels. Calcivet and Daily Essentials (Pet Care Ltd.) are two products mentioned although any number of preparations can be used but if a varied diet is given, their benefit will be negligible other than if conditions prevail where birds are stressed such as over-crowded conditions. Several breeders routinely give Probiotics.

CONSERVATION AND BREEDING PROGRAMMES

Both *Leiothrix* are popular aviary birds and as can be seen from the first breeding records below have been kept and bred for a number of years. They are easy to keep and breed if given the right conditions. However, as is beginning to become apparent with several once common species, numbers are beginning to dwindle. Pekins in particular are now quite uncommon avicultural subjects commanding nearly 10 times the price they were offered for less than two years ago. They should be easy to establish and it is hoped that the two groups below, coupled with these guidelines, may help to establish this beautiful genus in captivity.

Very few softbills are established in captivity and only after a concerted effort, as is happening with both the Bali Starling and Yellow-throated Laughingthrush, do they become so. Unlike the previous two species, Pekins and Mesias will need the help of private keepers and the rather insular approach of the governing body for UK public collections, could be a hindrance to what should be a relatively easy genus to establish.

FIRST BREEDING RECORDS

Pekin Robin	1891	Breeder unknown	Avicultural Magazine 1898:178
Silver-eared Mesia	1906	London Zoo	London Zoo Reports 1906:39

Taken from Coles (2003)

FOREIGN BIRD FEDERATION BREEDING TOTALS 1985-2001

	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	01
Pekin Robin	23	15	13	27	21	44	24	24	23	35	11	7	16	25	9	12	27
Silver-eared Mesia	-	-	-	10	11	4	1	8	10	8	5	2	5	4	31	2	6

PEKIN ROBIN INTEREST GROUP

An informal interest group has been formed mainly for private breeders of Pekins in the UK. This species has seen an increase of 125% in numbers bred between 2000 and 2001. Any breeder interested may contact the author for forwarding.

JOINT MANAGEMENT OF SPECIES PROGRAMME

Both Pekins and Mesias are recommended species for keeping and breeding in member collections of the Zoo Federation but no data is available. It is currently believed that only one collection is breeding Pekins.

NUMBERS HELD IN AMERICAN ZOOLOGICAL COLLECTIONS

Numbers recorded as being held in American collections subscribing to the International Species Inventory System (ISIS) for the years 1985-99. Taken from www.riverbanks.org/aig and originally compiled by the Avian Interest Group for the American Association of Zoological Parks and Aquaria. No breeding data is included.

	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
Pekin Robin	102	154	124	152	144	165	166	170	165	180	175	183	190	224	215
Silver-eared Mesia	19	14	39	63	62	77	102	104	97	97	94	92	75	70	67

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NOTES