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TITMICE IN WOODLANDS

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Figure 1. Blue Tit, *Parus caeruleus*

TITMICE IN WOODLANDS

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INTRODUCTION

The acrobatic titmice are among the most engaging of woodland birds. They are also among the best known, since they are often as common in suburban gardens as they are among the woods and hedgerows of the countryside.

Tits are characterised by their small size, a plump, thick-necked appearance, and by their gregarious habits. Six British breeding species concern us here—Great Tit, Blue Tit, Coal Tit, Marsh Tit, Willow Tit and Long-tailed Tit. A seventh species—the Crested Tit—has already been dealt with in Forestry Commission Leaflet No. 41 (H.M.S.O. 1*s.* 0*d.*), while an eighth species—the Bearded Tit—is outwith the scope of this account, since it is an inhabitant of dense reed-beds.

Tits are basically woodland birds which flit from tree to tree with a rather weak flight, though their wings beat rapidly enough. If the flight is at all prolonged it follows an undulating path. Titmice are omnivorous, for they eat insects, spiders and a variety of other small animals ; they take much vegetable material, such as buds, seeds, beech-mast and other nuts. They hold down the food with one foot while they peck at it. Food is usually carried off before being eaten.

When investigating a twig, a tit will often hang upside-down, and even swing momentarily on one leg, head downwards, while it pecks at some morsel on the underside. Sometimes the pecking sound can be amazingly loud for such a small bird. The tit may often actually take flight from the upside-down position.

Most species descend readily to the ground, where they rummage among dead leaves, and dig among moss beneath the trees. The feeding-heights of tits in trees tend to be zoned, Great Tits using the ground and lower branches, Marsh Tits and Long-tailed Tits intermediate heights, and Coal Tits and Blue Tits the top-most twigs and foliage.

Flights after insects, flycatcher-fashion, and hoverings to examine terminal leaves, are sometimes indulged in. Fighting for food is frequent, especially in mid-winter. Some species, particularly Long-tailed Tits, suffer greatly from severe winters.

" Titmice " is an ancient term which, like " Fluttermice " for bats, may be a survival from a time when any small active creature was referred to as a " mouse ".

Its more likely derivation, however, is from an ancient word " tit," represented by *titw* in Welsh and *tittr* in Icelandic ; and another equally old word now found as *meis* in Norwegian and *Meisse* in German ; thus the " mice " was once the singular form.

Apart from the Long-tailed Tit, which builds the remarkable domed nest of moss against a tree trunk or in a bush, all these tits nest in holes. They are usually holes already in existence, except for those used by the Willow Tit, which, though apparently ill-adapted for the purpose, normally hacks out its own hole, woodpecker fashion, in rotten stumps.

Most tits have a variety of call-notes, nearly all of which defy intelligent description on paper. None has a truly sustained and melodic song. Brooding birds hiss sharply when a finger is inserted in the nesting hole.

The majority of British tits are thought to be resident individuals, which, though they roam the woods in winter-time in nomadic parties, do not stray far from the place where they were hatched. These parties may often consist of more than one species. Unusually large numbers of tits which appear from time to time (though by no means every year) in autumn and spring, are thought to be temporary visitors from the Continent.

GREAT TIT

(See Figure 2)

Description

With a length of 5½ to 6 inches, the Great Tit is the largest British member of its family. The general colour of the upper parts is greenish-yellow, with bluish-grey on the wing-coverts, rump and tail ; the general colour of the underparts is sulphur-yellow. On each cheek is a conspicuous white patch below the

Figure 2. Great Tit, *Parus major*

eye. The crown and the nape of the neck are blue-black, and are pleasingly glossy. A black ring behind the cheek-patch runs from the nape down to the black throat. From there in turn, a broad black band runs like a " zip-fastener " down the centre of the breast towards the vent. There is a fairly conspicuous white wing-bar ; the outer tail-feathers also are white. As a rule the female is not so brightly coloured as the male nor is her " zip-fastener " so broad or so long. Young Great Tits have brownish caps and yellowish cheeks, and lack the striking colour contrasts of their parents. The bill is stout, short and mainly black in colour ; the legs and feet are lead-blue, and the iris brownish-black. The interior of the nestling's mouth is orange.

Distribution

The Great Tit breeds throughout the British Isles except Orkney, Shetland and the Outer Hebrides. In North-West Argyll, Western Inverness, Caithness and Sutherland, where its numbers used to be quite modest, it has now increased, following afforestation. In barren mountain and moorland areas it is quite a rare bird, being confined to valleys where there are trees. It is the only tit which breeds on the Scilly Islands.

Habitat

Besides woods of all kinds, but especially hardwoods, the Great Tit frequents parks, hedgerows, shrubberies, orchards and gardens. Its numbers in summer time in well-kept plantations of immature conifers depend largely on whether a few hardwood trees, old conifer stumps, walls and other features provide nesting-holes.

Food

The Great Tit is primarily an insect-eater, and probably no insects of any kind come amiss, even honey-bees falling victim upon occasion. An astounding number of caterpillars are brought to the young, and an estimate of 10,000 for a pair rearing a brood of eight chicks over a period of three weeks seems reasonable. Weevils and other beetles, caterpillars, chrysalids and adults of butterflies and moths, wasps, gall-wasps, ants, bees, grasshoppers and their allies, aphids, scale-insects and other bugs, flies and their maggots (especially those found in fungi) are among insect types eaten. Worms, small snails, slugs and spiders are among other small animal prey, while even small birds and a bat have been recorded as being killed.

Among vegetable matter, spring-time buds are damaged, but it is difficult to say to what extent this is offset by the destruction of harmful grubs inside the buds. In late summer and early autumn, fruit, peas, hazel-nuts and seeds of various kinds are eaten ; sunflower seeds are particularly relished.

Voice

The normal call-note of the Great Tit is a loud musical *tink-tink-tink*, which needs to be distinguished from the similar note of the Chaffinch. The most famous Great Tit note, however, is the loud " saw-sharpening " song which is best rendered as *teacher ! teacher ! teacher ! teacher !* These cheerful notes can be heard in every month of the year, although they are rare in July and August. On a fine winter's day, the ringing notes of this tit are one of the most joyful sounds to be heard in the woodlands. In addition, this species has a wide variety of miscellaneous notes which can only be learned from observation, combined with careful listening in the field. It can also imitate the call-notes of other birds.

Breeding

In March and April the Great Tit courts his hen by puffing out his black throat, black gorget and yellow breast, erecting his crown feathers, trailing his wings and elevating his tail.

The Great Tit will take readily to nesting boxes. By their use the number of Great Tits which frequent extensive conifer plantations where natural or artificial holes are scarce, can be greatly increased. Possibly, in such plantations, lack of nesting sites is a major factor in limiting the Great Tit population.

Any hole big enough to admit the bird, and to build a nest inside, which is otherwise suitable (e.g. not liable to flooding), may be used by Great Tits. Whether the site be natural or artificial is entirely fortuitous. Thus nest-holes in tree-trunks, branches, stumps, walls, rocks, sheds or other buildings are very frequent, but gate-posts, other birds' nests, squirrels' dreys, debris in hedges, woodpeckers', sand-martins' or kingfishers' nesting-holes, and all sorts of odd sites have been recorded.

Inside the cavity, a nest of moss and grass lined thickly with hair and other warm material, among which rabbits' fur is usually conspicuous, is built. Both sexes bring material. The warm fur of the lining often covers the eggs during periods when the bird is not sitting.

The clutch is normally 10 or 11, but any number from 5 to 18 eggs has been recorded. The larger clutches have sometimes been proved to be the product of two hen birds.

The eggs are white with reddish-brown blotches and spots, which may be fairly thickly distributed over the whole egg, or else may be grouped towards the thick end forming a loosely defined cap. The average size of a Great Tit's egg is 18 × 13·5 mm. or about ·72 × ·54 inches. It is a broad oval in shape, and the shell is slightly glossy.

The brooding hen sits very closely and is fed on the nest by the male bird, who incubates very little. Late April and early May is the normal laying season. Repeat clutches and genuine second broods (which are not very common) may be found in June. The incubation period lasts about 14 days once the clutch is completed. Both parents busily bring food to the young birds, which remain in the nest for around 3 weeks until they are ready to fly.

BLUE TIT

(See Figure 1)

Description

The length is about 4½ inches.

A Blue Tit, or " Tom Tit ", in the spring sunshine is a strikingly coloured little bird. Its crown, wings, tail-coverts and tail are brightest cobalt blue. A blue-black line runs from the bill through the eye and round the back of the head. Another dark band runs downwards through the throat, where it meets a dark horizontal collar at right angles. This collar travels backwards below the white cheek patch on either side, curving upwards towards the back of the neck, where it meets the upper band already mentioned. The forehead is white, and the blue of the crown is edged with white.

A white wing-bar is formed from the white tips to the greater wing-coverts. The mantle and back are green. The breast, flanks, and underparts generally are bright sulphur-yellow.

The legs and feet are bluish-grey ; the bill is black, with a horn-coloured tip. The iris of the eye is dark brown.

The adult female is a shade less brightly coloured than the male ; juveniles, however, are much duller. They have yellowish instead of pure white on the cheeks, forehead and nape, greenish-blue instead of cobalt on the crown, and a duller green on the back.

Nestlings have the inside of the mouth a dull orange red.

Distribution

The Blue Tit is resident throughout the British Isles, excepting only the Shetlands, Orkneys, Outer Hebrides, and some of the Inner Hebrides.

Habitat

The Blue Tit is best known in gardens, parks and hedgerows, as well as orchards, copses and other artificial plantings. However, it is fundamentally a bird of natural hardwoods, especially those of oak ; among conifers the breeding population may be low.

In winter Blue Tits are even more widely dispersed than in the breeding season, penetrating rough marshes, downland and other unlikely haunts. They even forage and roost in reed-beds.

Food

Vegetable food includes seeds of many kinds, buds, ripe fruits, and beech-nuts. More

specifically, the seeds include those of conifers, birch, sunflower, cereals, grasses and poppy.

The Blue Tit is largely an insect eater, and every stage of a wide variety of moths, butterflies, beetles (including weevils), gall-wasps and other Hymenoptera, aphides and other bugs, are taken. In conifers, the larvae of various moths are greatly sought after in winter. Blue Tits are fond of searching for insects, spiders and millipedes on and under the bark of trees, especially on dead limbs, of both hardwoods and conifers.

Voice

The trilling and scolding notes of the Blue Tits are familiar to most people. The bird has not quite such a wide vocabulary as the Great Tit, though its various trills, churrs, scoldings and phrases can be bewildering enough. This is particularly so in the summer, when the leaves hide the vocalist. It sometimes calls in flight.

Breeding

In spring time the nomadic flocks of tits break up, and pairs are formed, though some birds remain paired through the winter. Each pair retains its old territory, or claims a fresh one. In late February the cock begins to display at and around a chosen nest hole. He may offer the hen a small morsel of food or he may pop excitedly in and out of the nesting hole. Crown-feathers are raised into a crest, throats and chests are puffed out, tails cocked up, and wings drooped and shivered.

At other times the male, with wings extended, and quills widely spread, planes down to the female from above. Another special nuptial flight is one in which the wings are moved very rapidly through a small amplitude. Sometimes the pair sit side by side on a branch.

Any kind of natural or artificial hole may be used by Blue Tits. Building may begin by late March, but perhaps not till nearly a month later in a late spring. The completed nest may remain empty for a few days, or even for over a week before laying starts. The materials are moss for the bulk of the nest, with some dried grass. The lining is usually of feathers, with hair or wool as well. Lining material continues to be brought in while laying progresses, so that the eggs get more or less covered up. One egg is laid per day, at any time from mid-April till the first week of May.

From 6 to 18 eggs, in size somewhat smaller than Great Tit's, form the clutch. A second brood is relatively rare, though a repeat nest, if the first fails, is fairly usual. The eggs are white, and may be quite unmarked, but typical specimens have small specks of light chestnut. These are not infrequently clustered in a zone at the larger end. Incubation takes 14 days from the completion of the clutch. The young remain about 19 days in the nest.

COAL TIT

(See Figure 3)

Description

At 4¼ inches long, the Coal Tit is the smallest of the group. It is a much less showy little bird, having a glossy black cap, chin and throat. It has the usual conspicuous white cheek patches, but in addition, it has a bold white patch on the nape of the neck. This patch shows up well from the rear, and it forms the diagnostic characteristic of the species. It is vastly larger and more conspicuous than the pale patches in a similar position in the Blue and Great Tits, which are not pure white.

The back is grey, with an olive-green tinge. The rather short tail is greyish-black. There are *two* white bars on each wing, formed of more or less continuous white spots. The breast and underparts are white, but the flanks and under tail-coverts are buff. The sexes are alike.

The juveniles, however, have yellowish cheek and nape patches, instead of white, and are duller generally.

The bill is black, the legs and feet lead-blue, and the iris of the eye is brown. The inside of the mouth of nestlings is pinkish-orange.

Distribution

The Coal Tit is found generally throughout the British Isles, being absent only from the Shetlands, Orkneys, and Outer Hebrides.

Figure 3. Coal Tit, *Parus ater*

Habitat

The Coal Tit is the commonest tit of coniferous woods ; in the old Caledonian pines of Speyside and Deeside, and in some of the older planted forests, it is often positively abundant. In the younger and more extensive plantations of pure conifers the Coal Tit will sometimes be the only member of its genus present. It can use a mouse-hole in a bank, or other hole in the ground for its nesting site ; hence its numbers are not limited by a lack of holes in the trees.

Despite this partiality for conifers, the Coal Tit is still quite at home in hardwoods, orchards, and gardens. It is more widely dispersed in winter-time than in the breeding season.

Food

The insects and the seeds of conifers play a much more prominent part in the diet of the Coal Tit than they do in that of the others. However, other insects (especially ones taken from tree trunks), and seeds, as well as spiders, nuts, beech-mast, fat and meat are readily taken. Hunting is often done, tree-creeper fashion, by climbing up the trunks.

The Coal Tit has the engaging habit of making little stores of food. Morsels as different as nuts and slugs are concealed in chinks in bark or walls, or are buried in the ground below moss, leaves or grass. Sometimes they are deliberately covered, even if lodged above ground in a hedge.

Figure 4. Nesting site of Coal Tit, in a tree stump at ground level

Although there is some evidence that the tits can remember hiding places, what proportion of the food is recovered by the same birds as concealed it is not known. Great Tits sometimes watch the Coal Tits, fly to the hiding-place, and steal the food !

Voice

A somewhat less vehement and clarion, yet sweeter and perhaps more persistent, edition of the Great Tit's *teacher* ! *teacher* ! *teacher* ! note heard coming from the top of some spruce, pine or larch will almost certainly prove to be the charming little song of the Coal Tit. At other times the normal call-note, a thin and not very loud *tsee-tsee-tsee-tsee*, must carefully be distinguished from the similar note of other tits, the Tree Creeper and the Goldcrest.

Breeding

The Coal Tit has an attractive little display in which, perched before the female, he puffs out his breast feathers to show off his black throat, holding his head up high and fluttering his wings continually. Sometimes he feeds the female with a choice tit-bit. Sometimes, too, an aerial chase through the trees takes place.

Besides holes in trees, holes in banks, or elsewhere in or near the ground, are often favoured. (See Figure 4.) Thus natural nest sites are readily available, even in areas of young conifers. The holes may be very tiny, especially when, for instance, chinks in walls are used.

Both birds bring in the moss from which the bulk of the nest is constructed. The lining is the usual tit layer of felted fur, down or hair, with some feathers often present as well.

From 7 to 11 eggs comprise the majority of clutches ; they are white with reddish-brown freckles of two shades, rather thickly present. Late April sees the start of the laying season, the peak of which occurs early in May. Incubation lasts just under a fortnight, and the chicks spend about the same period in the nest. Both parents feed the young. There is usually only one brood.

MARSH TIT

(See Figures 5 and 6)

Description

The length is 4½ inches. The Marsh Tit is an even plainer bird than the Coal Tit, lacking entirely the white patch on the nape of the neck, and it has a slightly longer tail. It is typically warm-brown on the back instead of olive-grey. The tail and wings also are brown ; there are no wing-bars.

The crown is glossy-black in the adult Marsh Tit ; the chin is also black. The small cheek-patches are dull white. The underparts, too, are dull white, tinged with buff, especially on the flanks and under tail-coverts. The sexes are similar, but juveniles have a dull (not glossy) black crown, and have greyish-brown, rather than warm brown on the upper parts. At all ages the legs and feet are blue-grey, and the bill black. The interior of the chick's mouth is brownish yellow.

Distribution

The Marsh Tit is found in small numbers in all parts of England and Wales. In extreme South-West England, North Wales, and the approaches to the Scottish border, it is local ; in Scotland, it occurs only in Berwickshire. It is not found in Ireland.

Habitat

The Marsh Tit is somewhat misnamed, as its only association with marshes is purely incidental. It is primarily a bird of broad-leaved woods, copses, orchards, and gardens. It joins the flocks of other tits as they wander about, but out of a flock of several dozen, only two or three will be Marsh Tits. It is always worth looking for this species in elder brakes among deciduous woods. It takes less kindly to pure conifers than any of the other species.

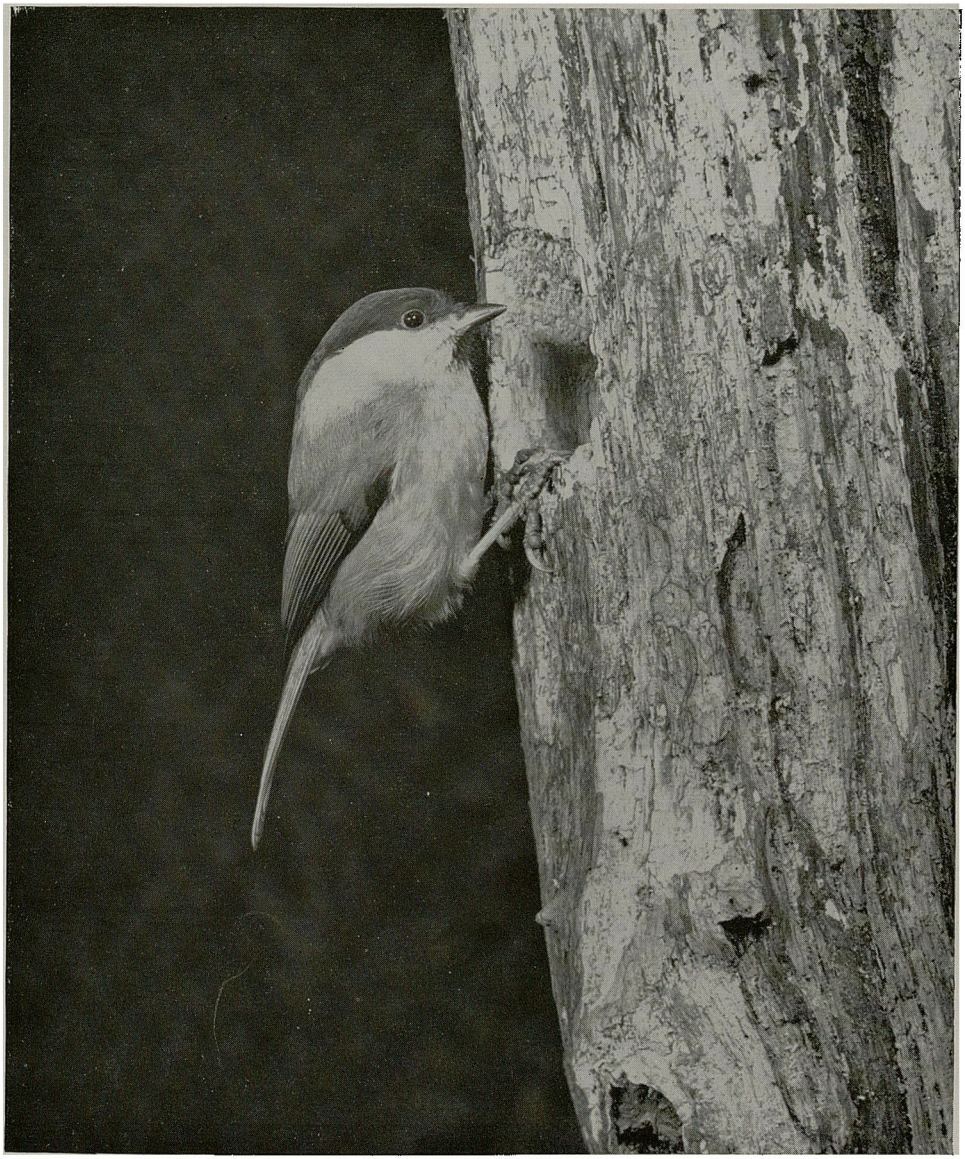

Figure 5. Marsh Tit, *Parus palustris* at its nesting hole in spring

Voice

The Marsh Tit has several distinctive call-notes. A loud *pitchew* or *pitichewee* is diagnostic of the species, as the similar-looking Willow Tit does not make it ; there is a harsh, nasal *tchair, tchair, tchair,* and *chick-adee-dee-dee-dee* is a scolding note often heard when the bird is put off the nest by human intruders. The song is a simple affair, in which bubbling musical notes or little phrases are uttered. An important use of this song is by rival males to denote the limits of their territories in the breeding season ; after May song ceases and the *pitchew* note takes over that function.

Food

Insects, seeds and berries form the food of the Marsh Tit. Like the Coal Tit, it will hide food away. The most interesting recorded example concerns a hoard of a dozen small crab-apples, which were purposefully stowed away in a crevice at the base of a tree.

Breeding

Inspection of possible nesting holes, to the accompaniment of song and display, commences in mid-January. During display, the glossy black cap or the black bib are shown off, together with tail-fanning, wing-shivering and other actions. Rival males indulge in quite fierce fights on the boundaries of their territories.

By mid-March the pair have focussed their attention on one particular hole at the entrance to which they peck vigorously, chipping away the bark. The cavity may be excavated by the birds if the wood is rotten (cf. Willow Tit). Pecking at the entrance hole is characteristic of all the hole-breeding tits, several holes, not only the favourite one, being pecked at. Marsh Tits use natural holes in trees more often than other types of hole. Most sites are within four feet of the ground, and holes as small as $\frac{7}{8}$ inch may be used.

The female starts carrying moss from the opening days of April. The male does little, if any, nest-building. The chief materials used, other than moss, are grass, hair, wool, fur (e.g. rabbit) and down (e.g. willow herb), though the proportions vary greatly, not all being used in any one nest.

Laying starts by mid-April, even a late bird commencing by early May. From 7 to 10 white, red-spotted eggs form the usual clutch. The hen alone incubates, hatching occurring after about 13 days. Both sexes collect food, and feed the young, which fly after 17 days.

WILLOW TIT

(See Figure 7)

Description

Being of the same size and general appearance as the Marsh Tit, the Willow Tit was not even recognised as a different species until 1900. It can best be identified by ear, as it has some distinctive call-notes. However, the main plumage-differences (all of which are apparent only under good observational conditions) are :

Firstly, the Willow Tit usually exhibits a pale broad patch on the closed wing, formed by the contrasting edges of the secondary wing-feathers. This patch (never conspicuous at the best of times) is even less obvious in summer-time, when the pale edges get worn away.

Secondly, the crown is *dull* sooty black instead of bright polished *glossy* black, but, here again, in strong light even the Willow Tit's crown shows a slight gloss. Nor is this feature of service with the juvenile Marsh Tit, which also has a dull crown.

Thirdly, the crown feathers are of a looser texture in the Willow Tit, giving it a less well-groomed appearance, compared with the sleek crown-feathering of the Marsh Tit.

Fourthly, the under parts, and especially the flanks and under tail-coverts, appear darker in the Willow Tit, as the buff has a warmer shade. Thus, there appears to be less contrast between the upper-parts and the under-parts of a Willow Tit than between those of a Marsh Tit.

Figure 6. Marsh Tit, *Parus palustris*, at a winter feeding point

Fifthly, both the black cap and the black bib are usually rather larger in the Willow Tit.

Lastly, the Willow Tit's tail is rounded at the corners (but this shows only when the tail is fanned), whereas that of the Marsh Tit is more square-ended.

In the field all available evidence from song, call-notes, nesting arrangements and geographical locality, as well as plumage, must be considered in order to establish certain identity.

Distribution

The Willow Tit is a bird with a rather patchy distribution. It is rare in, or absent from, Cornwall, the Scilly Isles, the Isle of Man, Anglesey and Ireland. In Scotland it breeds in small numbers as far north as Wester Ross, its main haunts being in the Lowlands.

Habitat

On the Continent the Willow Tit, like the Coal Tit, is largely a bird of coniferous forests, and in Britain our native race is found among plantations in East Anglia, Lanarkshire and, doubtless, elsewhere. However, its main preference is for rather damp deciduous woods with a good secondary undergrowth. Alder holts, and other damp woods and copses with plenty of rotten stumps, especially near water, are favoured for nesting. In winter time it may travel into hedgerows and more open country, away from trees.

Voice

The song of the Willow Tit includes sweet warblings and twitterings comparable to those of a Canary, but less loud. No other tit in Britain has such a song. An attractive call-note resembles the *pioo pioo pioo* of the Wood Warbler, while notes reminiscent of the Nightingale, Tree Pipit and Goldfinch may be heard. The females sing at times.

The chief call-notes are a thin, distinctive, but easily missed *eez eez eez*, which is frequently given, and a loud nasal *chay chay chay* which, once learned, is diagnostic as it is deeper and more grating than the equivalent note of the Marsh Tit.

Food

Relatively little is known about the food of the Willow Tit, but it certainly consists of insects at all stages, spiders, fruits, including honeysuckle and spindle berries, and seeds. Food is often hidden. The young are fed on whatever catepillars are locally abundant.

Breeding

Territorial boundaries are adjusted and stabilised about mid-March, when courtship, including courtship-feeding, display-flights, and song are in full swing. The breeding territory is quite often in a swampy thicket where rotten stumps occur. In one of these—most likely a birch, willow, elder or alder—the Willow Tits dig out their own nesting chamber, almost woodpecker-fashion. (*N.B.* occasionally Marsh Tits excavate their own hole.) They may make a false start or be evicted by other tits. A natural hole is used only rarely, even repeat holes being self-excavated. Most of the larger wood chips are carried away.

On the wood chips of the nest-hole floor, a loose foundation of vegetable material, such as fibres, grass and bark-strips, is built. Moss is usually absent (unlike other tits). A thin pad of rabbit's fur, down or wool serves as a lining ; the whole affair is typically a far less bulky structure than that of the Marsh Tit. 8 or 9 eggs are the usual clutch. The white, red-speckled eggs are slightly more richly and brightly marked on the whole than those of the Marsh Tit. Laying occurs late in April or early in May.

The hen alone incubates, the cock feeding her on or near the nest. Hatching occurs after about the 13th day ; both parents feed the young, which leave the nest about 18 days after hatching. The pale wing-patch and rounded tail (due to the shortness of the outermost feathers) are apparent even in a juvenile.

Figure 7. Willow Tit, *Parus atricapillus*

LONG-TAILED TIT

(See Figure 8)

Description

The long tail of this tit accounts for half of its length of 5½ inches, and makes recognition of an adult immediate and certain. The call-notes are quite distinctive, too, and often attract attention to the bird. Once located in the bushes, it is seen to be a study in tones of pink, white and black. The head is basically white, with a broad ragged black stripe over the eye. The back and upper parts generally are mixed pink and black ; the tail is black with the outermost feathers white.

Below, the bird is generally dirty white, becoming pinker on the flanks, towards the belly, and on the under tail-coverts. The wing feathers are mostly brown with white edgings. The juveniles do not have the pink; they have dark sides to the face, and have much shorter tails. The bill is black, and the legs and feet dark brown in adults ; in juveniles these parts are black with yellowish base and tip, and dull flesh-colour respectively. The iris is a dark hazel, and the whole eye has an attractive bright pink ring round it. The inside of the mouth of the nestlings is yellow ochre.

Distribution

The Long-tailed Tit is found over the whole of Great Britain and Ireland, but is only a straggler to the Scillies, Isle of Man, Outer Hebrides, some of the Inner Hebrides, Orkney and Shetland.

Habitat

This tit is more a frequenter of bushes and thick hedges than of dense deciduous woods ; when found there, it is either on the outskirts, or in places where there is a good deal of shrubby undergrowth. It is quite fond of young coniferous plantations where the trees are wide apart, and are six feet or more in height. In fact, after the Coal Tit, the Long-tailed is the one most fond of plantations. It visits gardens less than the other species, not usually nesting in them. Old orchards, however, often attract it.

Food

As with other tits, the diet primarily consists of insects, with other small animals, such as centipedes and spiders, mixed with vegetable matter, such as seeds and buds.

Voice

A low *tupp tupp tupp*, a trilling *tsirrup* and a repeated *see see see* are the main call-notes of this bird. It has also a modest bubbling little song in which the call-notes feature prominently.

Breeding

The roving, follow-my-leader flocks of Long-tailed Tits, which are such a feature of the winter woods and hedgerows, begin to break up in February. Pairs are formed, in the process of which various displays occur. One type of love-flight is an aerial chase of extra-ordinary swiftness for such a weak-flying species.

Nest building often begins in March, for the " Bottle Tit " is the earliest breeder of them all. A favourite site is in the heart of a thorn or sloe bush, a gorse, broom, juniper, bramble or low conifer also being likely choices. (See Figures 8 and 9.) A completely different type of site is up against the trunk of a tree, where an entwined honeysuckle, for instance, may support the structure. Then, again, the angle between a side branch and the trunk, or a bifurcation of the trunk itself, is often used to seat the nest. Although most nests are at the height of a man, or lower, occasional examples are up to seventy feet above ground !

Both partners bring materials to build the nest. How different is this from that of other tits ! The pair usually arrive back home together, each diminutive bill bulging with a parcel of mosses, lichens or feathers. Only one bird works at a time while the other impatiently waits its turn on a nearby twig. The constructor shapes the cup with its breast,

Figure 8. Long-tailed Tit, *Aegithalus caudatus*, and young at their nest in a whin bush.

its tail waving vertically above, while on occasions, when the nest is three-quarters built, the bird all but stands on its head!

Moss forms the main material ; it is bound together with cobwebs and hair, and decorated with lichens. The shape is an upright oval ball, with the entrance-hole on one side, quite near the top. The lichens of the nest blend remarkably with those around, when the tree trunk type of site is used.

The lining is as extraordinary as the exterior, in that 2,000 or more feathers may be amassed for the purpose ! Even if several are carried at a time, the journeys required to gather the lining alone are formidable.

The building takes about nine days, the lining, which takes about the same time, being added after a 2-3 day rest. Laying, at the rate of one egg per day, starts a few days after completion of the lining, i.e. over three weeks after building started. The clutch numbers from 7-12, 8-10 being most frequent.

The eggs are smaller than those of other tits, white, with light red and pale purple markings. These can vary from being almost negligible to being arranged in quite a bold cap or collar at the large end. Laying can occur early in April, mid-April being normal.

The hen does most of the brooding. The long tail is cocked forwards over the back, so

Figure 9. Nest of Long-tailed Tit, built amid brambles

that its tip sticks out of the entrance-hole. The eggs hatch about 13 days after completion of the clutch, and the young fly in just over another fortnight. Both parents feed them, and since both roost in the nest at nights, it is positively bulging by the time the young are feathering ! There is only one brood each year.

The family party keeps together throughout the summer, joining other families in the autumn and winter, when up to 50 may be seen. They then mix freely with nomadic tits of other species.

TITMICE AND FORESTRY

The inter-relationships between birds, insects and trees have been subject to much controversy. Numerous and variable factors are involved, but valuable and enlightening research has been done in Britain, Holland and Germany. This work continues.

Since 1946 the Edward Grey Institute, Oxford, has been carrying on a research programme on the population ecology of tits, under the general direction of Dr. David Lack. The work has been done in mixed woods near Oxford, and also in Scots and Corsican pines in the Forestry Commission plantations at Thetford Chase, on the borders of Norfolk and Suffolk.

While this research has shown that in oak-woods in summer-time the thousands of larvae eaten by tits represent only a small proportion of the total, the position in pine plantations in winter time may be quite different, for then the proportion of insects taken can be quite significant.

At Thetford, Dr. John Gibb and his associates have shown that birds, especially tits, eat a substantial proportion of the insect population in winter. Predation by tits (also Goldcrests) at that season is now thought to be a significant factor in governing the insect numbers. On the other hand, it has been shown that the density of the small birds themselves is determined largely by the total available winter food supply.

While it is thought certain that birds can make no significant inroads upon a major insect plague once it has broken out, it looks as though they can have a worthwhile (but not decisive) part to play in keeping populations of insects within normal bounds. The state of present knowledge, together with references to other published results, is summarised by Dr. Gibb in the *Ibis* (April 1960, Vol. 102, No. 2).

While final conclusions can certainly not be drawn and further research is required into an extremely complicated subject, the likelihood is increasing that the active encouragement of tits and other small birds in plantations may be beneficial.

NESTING BOXES

Foresters wishing to increase the number of tits in their woodlands should experiment with nesting boxes. These should have an entrance hole not greater than 1⅛ inch, which is small enough to keep out sparrows. A simple box suitable for mass-production has been designed by Mr. D. A. Cousins and tried out in the Forest of Dean. Details are given on p. 9 of *Nest Boxes*, by Edwin Cohen and Bruce Campbell. (Field Guide No. 3, published by the British Trust for Ornithology, 2 King Edward Street, Oxford, price 2*s.* 6*d.*)

Apart from normal commercial sources nest boxes may be purchased from the Royal Society for the Protection of Birds, 25 Eccleston Square, London, S.W. 1, or 21 Regent Terrace, Edinburgh 7. These boxes are made by Scottish war-blinded ex-servicemen at Linburn. The current price is 10*s.* 0*d.*, post free, complete in a suitable carton and containing an instruction leaflet.

CONCLUSIONS

It will be seen that the tits are fascinating forest birds which are more likely than not of benefit to the forester. Although locally, wherever conifers have replaced hardwoods, the numbers of tits may have been reduced, the afforestation of large tracts of open hillside, especially in Scotland and Wales, has resulted in a huge increase in tit populations, Coal Tits and Long-tailed Tits being the chief beneficiaries.

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This leaflet has been written by Mr. C. E. Palmar, Curator of the Department of Natural History in the Glasgow Art Gallery and Museum. He wishes to acknowledge reference to various papers which have been published in *British Birds*, *Bird Study* and the *Ibis*, especially to the invaluable paper by Dr. John Gibb in Vol. 102, No. 2 of the *Ibis* for April 1960, to which the reader is referred for fuller details of tits and forestry, as well as bibliographical references.

John Markham took the photographs, except for Figures 4 and 9, which are by the author. In Figures 1 to 3, and 5 to 7, the birds are shown at a little less than life size.

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