Cutaneous diseases of wild birds in Britain
D. K. Blackmore and I. F. Keymer

Plates 54-56

INTRODUCTION

Five years ago we published a brief account of the rather limited information available concerning skin diseases of wild birds (Keymer and Blackmore 1964). It was pointed out that the scattered records of ornithologists suggested that some particularly interesting pathological syndromes might exist in our wild bird population, but hitherto these records had not been correlated, neither had laboratory facilities been available for the examination of specimens. A request was made for future records and specimens to be sent to D.K.B., and more recently to I.F.K., so that the whole problem of skin diseases in wild birds could be examined in greater detail.

The present contribution gives the results of this survey, which includes 153 individual records. These records appear to reveal some information of considerable interest concerning avian comparative pathology and also indicate that a much more detailed study, particularly of specific syndromes, would be valuable. Table 1 shows the bird species and total records, while table 2 summarises the incidence of the various diseases in the order of the sections which follow.

(1) BACTERIAL INFECTIONS

Tuberculosis

Two cases associated with cutaneous lesions in a Kestrel *Falco tinnunculus* and an immature Herring Gull *Larus argentatus* were diagnosed. The skin overlying the ventral aspect of the right wing of the Kestrel showed multiple round and ovoid tumour-like masses up to 3 cm in diameter (plate 54b). Histological examination revealed typical granulomatous lesions containing acid-fast organisms resembling *Mycobacterium tuberculosis*. The immature Herring Gull had a large ulcerated swelling affecting the carpal joint of the right wing. Numerous acid-fast organisms were demonstrated from this lesion, and on cultural examination they were confirmed to be *M. tuberculosis*. The liver also contained minute miliary tubercular lesions.

Similar skin infections have been reported by others. Although tuberculosis is common in wild birds, the lesions are usually confined to the internal organs. Darkening of the plumage of infected Woodpigeons *Columba palumbus* was first reported by McDiarmid (1948) and later by Harrison and Harrison (1956). Harrison and Hay (1959) also recorded and illustrated loss of toes in a Moorhen *Gallinula chloropus* due to this disease.
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Table 1. Number of each species involved in the 153 records of cutaneous diseases of wild birds in Britain

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Species</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>Mallard <em>Anas platyrhynchos</em></td>
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<td>Blackbird <em>Turdus merula</em></td>
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<td>Kestrel <em>Falco tinnunculus</em></td>
<td>1</td>
<td>Robin <em>Erithacus rubecula</em></td>
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<tr>
<td>Pheasant <em>Phasianus colchicus</em></td>
<td>2</td>
<td>Sedge Warbler <em>Aerocephalus schoenobaenus</em></td>
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<tr>
<td>Woodcock <em>Scolopax rusticola</em></td>
<td>1</td>
<td>Blackcap <em>Sylvia atricapilla</em></td>
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<tr>
<td>Dunlin <em>Calidris alpina</em></td>
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<td>Dunnock <em>Prunella modularis</em></td>
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<tr>
<td>Herring Gull <em>Larus argentatus</em></td>
<td>3</td>
<td>Meadow Pipit <em>Anthus pratensis</em></td>
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<tr>
<td>Common Gull <em>Larus canus</em></td>
<td>1</td>
<td>Pied Wagtail <em>Motacilla alba</em></td>
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<tr>
<td>Woodpigeon <em>Columba palumbus</em></td>
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<td>Starling <em>Sturnus vulgaris</em></td>
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<td>Skylark <em>Alauda arvensis</em></td>
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<td>Greenfinch <em>Carduelis chloris</em></td>
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<td>Great Tit <em>Parus major</em></td>
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<td>Chaffinch <em>Fringilla coelebs</em></td>
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<td>House Sparrow <em>Passer domesticus</em></td>
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<td>Coal Tit <em>Parus ater</em></td>
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<td></td>
</tr>
<tr>
<td>Song Thrush <em>Turdus philomelos</em></td>
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Other bacterial infections

An unusual example of dermatitis below the mandible of a Robin *Erithacus rubecula*, caused by *Listeria monocytogenes*, was described by Macdonald (1968). Swollen eyelids and sinusitis associated with *Mycoplasma gallisepticum* was first described in Pheasants *Phasianus colchicus*, Partridges *Perdix perdix* and Red-legged Partridges *Alectoris rufa* in this country by Keymer (1961), and later elsewhere in Europe. Judging, however, from the annual reports of the Game Research Association (Jones and Wood 1968), the incidence of this disease appears to have declined in Britain in recent years.

Birds are less susceptible than mammals to secondary infection of wounds by bacteria, but some cases of localised staphylococcal infection were recorded during the course of this survey and are noted in the section on INJURIES AND LOCALISED INFECTIONS (pages 324-325).

(2) Virus infections

Pox

The carcases of five House Sparrows *Passer domesticus* with cutaneous encrustations around the eyes were received for examination, and the condition diagnosed as pox. One was from Burnley, Lancashire, while the other four were from an area in west London where other House Sparrows had been seen dead or dying. Three were male and one female (the fifth’s sex was not recorded). All had encrustations of the skin around the commissures of the beak and the eyes. In one case there were similar lesions on the head, while in another there was involvement of the hard palate and dorsal surface of the tongue. Histological examination of these lesions revealed typical Bollinger bodies, diagnostic of avian pox. Identical lesions were reproduced in experimental House
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Table 2. Analysis by conditions and species of the 153 records of cutaneous diseases of wild birds in Britain

<table>
<thead>
<tr>
<th>Condition and total</th>
<th>Species</th>
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<td><strong>BACTERIAL INFECTIONS (2)</strong></td>
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<tr>
<td>Tuberculosis (2)</td>
<td>Kestrel <em>Falco tinnunculus</em></td>
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<td>Herring Gull <em>Larus argentatus</em></td>
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<td><strong>VIRUS INFECTIONS (30)</strong></td>
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<td>Pox (27)</td>
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<td></td>
<td>Blackbird <em>Turdus merula</em></td>
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<td>Dunnock <em>Prunella modularis</em></td>
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<td></td>
<td>Starling <em>Sturnus vulgaris</em></td>
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<td>House Sparrow <em>Passer domesticus</em></td>
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<td></td>
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<td></td>
<td>Common Gull <em>Larus canus</em></td>
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<td><strong>MYCOTIC INFECTIONS (7)</strong></td>
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<td>Mycotic dermatitis (7)</td>
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<td></td>
<td>Dunnock</td>
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<td>House Sparrow</td>
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<td><strong>PARASITIC INFESTATIONS (5)</strong></td>
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<td>Knemidokoptic mange (4)</td>
<td>Pheasant <em>Phasianus colchicus</em></td>
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<td>Skylark <em>Alauda arvensis</em></td>
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<td><strong>NEOPLASIA (20)</strong></td>
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<td><strong>INJURIES AND LOCALISED INFECTIONS (5)</strong></td>
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<td>Blackbird</td>
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<td></td>
<td>Robin</td>
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<td></td>
<td>Blackcap <em>Sylvia atricapilla</em></td>
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<td>Alopecia of unknown etiology (74)</td>
<td>Mallard <em>Anas platyrhynchos</em></td>
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<td>Blue Tit</td>
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<td>Song Thrush <em>Turdus philomelos</em></td>
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</tr>
<tr>
<td></td>
<td>Dunnock</td>
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<td></td>
<td>Pied Wagtail <em>Motacilla alba</em></td>
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<td></td>
<td>Starling</td>
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<td>Greenfinch <em>Carduelis chloris</em></td>
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<tr>
<td></td>
<td>Chaffinch</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>House Sparrow</td>
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<tr>
<td><strong>Articular gout (2)</strong></td>
<td>Woodpigeon <em>Columba palumbus</em></td>
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<tr>
<td><strong>Claw and bill deformities (8)</strong></td>
<td>Starling</td>
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</table>
Sparrows by the injection of material from Canaries Serinus canarius which had died as a result of 'Canary Pox'.

Records were also received of eleven juvenile House Sparrows, ten caught at Morden, Surrey, over a two-year period and one at Northampton, which all showed lesions probably associated with a chronic pox infection. Seven had small 'wart-like' lesions on the feet, three had similar lesions on the head, especially around the eyes and beak, and one had lesions on the flank. Similar lesions were observed on the heads of four Starlings Sturnus vulgaris and three Dunnocks Prunella modularis from the same area in Surrey. Two other Dunnocks, one from Morden and one from Chippenham, Wiltshire, had similar lesions on the feet.

Histological examinations were carried out from wart-like lesions on the leg of a Dunlin Calidris alpina (Green 1969) and from the wing of a Blackbird Turdus merula. The appearance of both lesions was strongly suggestive of pox, with intracytoplasmic acidophilic inclusions in the epithelial cells.

It is surprising that during this present survey we have received no reports of pox in Woodpigeons. Whether this means that the disease is less common than previously, or that it has been overlooked, is impossible to say. Certainly the condition appeared to be common in Britain several years ago in the experience of Marriage (1961) and of I.F.K. who carried out a survey of diseases of wild birds from 1st March 1954 to 17th January 1962. During this period 284 Woodpigeons were examined and pox was diagnosed in 17 cases. This figure is low because observers did not shoot every infected pigeon, and usually several in a flock were seen to be affected. Outbreaks were mainly encountered during the winter months in 1954, 1955 (Keymer 1958), 1957, 1959, 1960 and 1961, the disease being reported in Cambridgeshire, Essex, Huntingdonshire, Norfolk, Hampshire and Surrey, although it may well have been more widespread. Murton (1965) thought that the disease was unusually prevalent during the 1955/56 winter, and this also seemed to be the case during the winter of 1960/61.

Both immature and adult Woodpigeons of both sexes are affected. The lesions in the early stages take the form of vesicles or pustules on the skin, especially around the eyelids, near the base of the mandibles and on the feet and legs. Almost any part of the body may be affected. Lesions are not infrequently seen on the wings and around the vent. In chronic infections, the lesions are very firm brownish granulomatous growths, which frequently cause lameness when the feet are involved. Lesions of this type have been illustrated by Keymer and Blackmore (1964). The disease, especially the acute form, can be readily transmitted experimentally to Domestic Pigeons Columba livia.

Pox is by far the most common virus causing skin lesions in wild birds and a comprehensive bibliography has been compiled by Kirmse (1967). In all species the lesions consist mainly of wart-like growths
affecting the eyelids and feet. There are at least three avian strains of
the virus, mainly affecting birds of three orders: Galliformes, such as
Domestic Fowls Gallus gallus, Pheasants and probably Partridges;
Columbiformes, especially Domestic Pigeons and Woodpigeons;
and Passeriformes, such as Canaries. There is an increasing amount of
evidence that several other strains exist and, as little is known about
these, it is particularly important to attempt isolation of the virus from
wild birds.

Pox lesions at the commissures of the beak in Woodpigeons can
resemble the lesions produced by the protozoan disease, trichomoniasis,
which in the early years of this century was referred to by game­
keepers and others as diphtheria. This parasitic infection also affects
birds of prey and has been known for centuries by falconers by the
name ‘frounce’.

Puffinosis or vesicular dermatitis
Three cases of vesicular lesions of the feet of gulls, possibly initially
caused by this virus infection, were reported to us. Two Herring Gulls
and one Common Gull Larus canus (plate 54a) were affected, but in only
two cases were laboratory examinations carried out. The foot of an
immature Herring Gull, from Bangor, Caernarvonshire, contained a
large vesicle on the ventral surface of the web of the left foot, between
the second and third digits. This vesicle had apparently originated
within the epithelium, and contained a milky fluid from which a
coagulase positive Staphylococcus was isolated. The lesion was similar to
those recorded in Manx Shearwaters Puffinus puffinus affected with puf­
finosis (Harris 1965).

The whole foot and lower part of the tarso-metatarsus of a Common
Gull was grossly swollen, due to subcutaneous inflammatory reaction,
from which a mixed growth of organisms was isolated, consisting of
species of Pseudomonas, Proteus and Streptococcus. This bird was from
Mousehole, Cornwall, where several other gulls similarly affected had
been observed. A juvenile Herring Gull, with apparently the same
condition, was observed by D.K.B. in exactly the same area four years
later. This bird had a circumscribed large swelling affecting the medial
aspect of the base of the foot and lower tarso-metatarsus.

This disease appears to be confined to certain species of seabirds
in the orders Procellariiformes, Pelecaniformes and Charadriiformes.
A useful review of the recorded host range was published by Macdonald
et al. (1967).

Other virus infections
There appear to be no other virus diseases recorded in Britain, or
indeed in Europe, which are associated with cutaneous lesions in wild
birds.
(3) MYCOTIC INFECTIONS

One of the major reasons for carrying out this survey was an attempt to gain more information about fungal infections of the skins of wild birds. Our previous paper (Keymer and Blackmore 1964) reviewed the very limited literature up to that time. Virtually nothing has been published since, but Pepin and Austwick (1967), who have examined some of the birds in the present survey, stated that in eight skin scrapings from wild birds examined by them during 1955-66 no common dermatophytes were isolated. They believed, however, that the isolates were in fact pathogenic, on the basis of the histological lesions and certain cultural characteristics.

Six carcases of wild birds—two Robins, two House Sparrows, a Dunnock and a Blue Tit Parus caeruleus sent from Surrey, Somerset, Hertfordshire, Oxfordshire and Yorkshire—showed fungal infections of the skin, with associated loss of feathers, and a similar condition was found in a captive Bullfinch Pyrrhula pyrrhula (plate 55a). The head was the most consistently affected area, and in five of these seven birds it was the part most seriously affected, although in one of the House Sparrows the lesions were confined to the ventral surface of the neck, and in the captive Bullfinch to the leading edge of the wings. The other House Sparrow also had lesions on the neck, one wing and the inner aspect of the upper part of one leg, whilst one of the Robins also had extensive lesions on the breast. In all cases, the affected skin showed varying degrees of thickening with yellow or white superficial encrustations and loss of feathers. There was a fairly distinct demarcation between the feathered and denuded areas, giving the birds a very distinctive ‘bald-headed’ appearance; a typical example of this was illustrated by Soper and Hosking (1961). Histological examination of all seven birds revealed a hyperkeratosis and infiltration of the keratinised layers of the skin and feather follicles with slender fungal hyphae. In most cases, P. K. C. Austwick (in litt. 1966), of the Central Veterinary Laboratory of the Ministry of Agriculture, Fisheries and Food at Weybridge, was able to isolate fungi from the lesions, but these isolations either could not be identified or were species, such as Penicillum, which are not normally considered to be pathogenic.

Data and material were also received from another Dunnock which had suffered severe loss of feathers from the head, associated with encrustations of the denuded areas of skin (R. H. Poulding in litt. 1965). Histological examination revealed infiltration of the skin with fungal hyphae.

(4) PARASITIC INFESTATIONS

Knemidokoptc mange

Skin lesions of parasitic origin are almost entirely caused by arthropods, especially mites of the genus Knemidokoptes (=Cnemidocoptes). Six
definite or apparent cases involving the legs and feet of wild birds were recorded in this survey (though two of them came from Africa). They concerned a Pheasant, four Sedge Warblers *Acrocephalus schoenobaenus* (two in Nigeria) and a Skylark *Alauda arvensis*.

The Pheasant, which was a free-living individual shot during its first winter at Cranborne, Dorset, was shown to be affected by the mite *K. mutans*. The shanks of both legs were swollen and had marked yellow encrustations, especially on the posterio-lateral aspects, with distortion and raising of the scales of the leg (plate 55b). Numerous mites were isolated, and histological examination revealed marked hyperkeratosis and mites in the *stratum corneum*. The feet and legs of two of the Sedge Warblers, which were trapped in Nottinghamshire, were affected by very similar lesions and, although no laboratory examinations were carried out, the photographs taken strongly indicated a similar parasitic infestation. The two Sedge Warblers in Nigeria had almost identical lesions which proved to be caused by *K. jamaicensis* (*Fry et al.* 1969). The Skylark, trapped in Suffolk, was said to have ‘wart-like’ growths at the junction between the claw and digit on the external, middle and hind toes of the left foot, and one similar lesion on the hind toe of the right foot; the hind claw of the left foot was completely missing. Very significantly, it was observed that ‘the skin of the left leg was dry and flaky’ and it is possible that these lesions were also due to a *Knemidokoptes* mite.

It should be added that *Kirmse* (1966) published an excellent paper on *Knemidokoptes* and other mite infestations of North American birds, and listed several references to occurrences of these mites in Britain and other parts of the world.

Other types of acarine mange

A number of species of mites of the family Epidermoptidae, such as *Microlichus avus*, may produce mange-like lesions as illustrated by *Keymer* and *Blackmore* (1964); this family of mites has also been reviewed by *Fain* (1965). Mites of the genus *Harpyrhynchus* invade the feather quills and follicles and may produce cysts (*Macdonald* 1965a), whilst those of the genus *Syringophilus* may also, but less frequently, be implicated. *Keymer* (1969) has recently reviewed the pathogenicity of skin mites and other ectoparasites of birds.

Other parasitic conditions affecting the skin

Occasionally tick infestations may be so heavy that, when viewed from a distance, they can be confused with warts. I.F.K. encountered such a case at Weeting, Norfolk: a hen Pheasant had the parasites *Ixodes ricinus* clustered around both eyes (plate 56a). A Blackbird affected by a very heavy louse infestation is recorded under *Alopecia of unknown etiology* (page 325).
Although trichomoniasis does not cause skin lesions, heavy infections of the buccal cavity may occasionally cause deformities of the mandibles in Woodpigeons, and these may be confused with pox, as already stated.

(5) Neoplasia

Squamous papilloma of the feet of Chaffinches

Neoplastic conditions or tumours are uncommon in wild birds, with the notable exception of this disease of Chaffinches Fringilla coelebs. The first record in Britain appears to have been that of Jennings (1959) who briefly referred to ‘papilloma of claw’ of a Chaffinch. The first record of the condition in this survey was by Washington (1964), and the nature of the lesions was later confirmed (Keymer and Blackmore 1964). The condition appears to be specific to Chaffinches. Records of 16 further cases have been received and, although only eight of these were actually examined histologically, the other diagnoses of this very characteristic disease appear to have been correct. Of the 16 cases, eleven were of free-living wild birds and five of aviary-kept birds. There appears to be no sex susceptibility, six of the affected birds being males, nine females and one of unrecorded sex. In only two cases were the ages known, but it is interesting to note that in both these the affected individuals were under two years old. In twelve cases only one foot was affected, but in the other four the lesions were bilateral.

The lesions have already been described by Keymer and Blackmore (1964) and illustrated by Washington (1964). The whole of the diseased foot and lower part of the tarso-metatarsus is usually affected by a highly keratinised papillomatous lesion, which often obscures the individual digits and results in considerable overgrowth and distortion of the claws. Histologically, the lesions are typical papillomas exhibiting marked acanthosis and hyperkeratosis with comparatively little fibrous supporting tissue. A record was also received of a flock of about 20 Chaffinches, predominantly males, approximately 50% of which were affected by a scaly wart-like growth of the legs and toes. Unfortunately, none of these was subjected to a laboratory examination.

This papillomatous condition of the feet of Chaffinches is apparently a relatively common disease, although its exact incidence is unknown. D. Washington (in litt. 1968) reported that four out of 244 (1.6%) free-living wild Chaffinches handled by him were affected. The condition has also been recorded in Britain by Macdonald (1965b) and in Germany by Groth and Abs (1967). The latter described it in 19 Chaffinches and considered that it was probably of viral origin, although they failed to demonstrate the presence of a virus.

Other neoplastic conditions

Apart from the Chaffinches with papillomatosis, only four other records
of birds affected by possible neoplasms have been received. Both a Coal Tit *Parus ater* and a female Starling were observed to have a single smooth wart-like lesion on one eyelid. The lesions may have been sebaceous cysts or due to a chronic pox infection. A captured male Starling was noticed to have a small haemorrhagic wart-like lesion near the base of the upper mandible. A record was also received of a Meadow Pipit *Anthus pratensis* with a dark grey neoplastic-like mass at the back of its mouth, extending into the lores and preventing complete closure of the beak in a manner similar to that described in a Starling by Park (1959). In both cases it is possible that the lesions were caused by a chronic pox infection.

Wart-like growths involving the skin and other external surfaces have been reported in a number of species, but cannot be differentiated from such virus infections as pox without microscopical examination of the affected tissue. What appear, however, to be authentic records of neoplasms affecting the feet and legs of wild birds in Germany have included papillomas on Starlings (Heller 1910); a probable epithelioma affecting a crow *Corvus* sp. (Joest and Ernesti 1916); and a type of carcinoma involving the tibio-tarsal tarso-metatarsal joint of a Lapwing *Vanellus vanellus* (Schlegel 1916).

(6) INJURIES AND LOCALISED INFECTIONS
There is little doubt that the vast majority of lesions affecting the mandibles or feet and legs are traumatic in origin and several specimens received have revealed some interesting abnormalities.

An adult female Starling found in a collapsed state in Burnley, Lancashire, subsequently died and was sent for examination. The direct cause of death appeared to be associated with a very heavy tapeworm and roundworm infestation. It was noted, however, that almost all the primaries and secondaries of the left wing were badly singed, and that the epidermal scales overlying the left digital tarso-metatarsal joint, the dorsal surface of the left foot and the medial aspect of the right foot were absent. The skin concerned showed a low-grade inflammatory reaction and degenerative change of the epidermis. It is tentatively suggested that these lesions may have been caused by the bird indulging in so-called smoke-bathing (see Simmons 1964); this behaviour has been previously recorded in different species of birds and is probably related to anting.

Staphylococcal arthritis in Pheasants was described by Hole and Purchase (1931), who thought that the organisms entered the skin and joints through scratches inflicted by thistles. Macdonald (1965a) also reported a similar condition in gulls and a staphylococcal dermatitis in a Peregrine *Falco peregrinus*. The feet of a Woodcock *Scolopax rusticola* shot at Cranborne, Dorset, were received for examination: the left foot had a large swelling approximately 1 cm in diameter in the inter-
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digital region on the ventral surface. The lesion had a necrotic granulomatous core, from which a coagulase positive *Staphylococcus* was recovered, and it was identical to the condition known as 'bumble foot', a staphylococcal arthritis of domestic poultry. The second digit of the right foot was fixed, due to an old fracture involving the joint between the first and second digital bones. Details were also received of a first-year female Robin affected by 'bumble foot': the base of the right foot was affected by a typical abscess approximately 6 mm in diameter from which, on histological examination, organisms resembling *Staphylococci* were demonstrated; a similar, but smaller, lesion affected the hind toe of the left foot. In addition, photographs of a female Blackcap *Sylvia atricapilla* caught at Wilton, Wiltshire, were examined: both feet were swollen on their ventral surface, with apparent involvement of the tarso-metatarsal digital joints; the claws were grossly overgrown, and the swellings, which resembled those associated with 'bumble foot', were approximately 5 mm in diameter.

A juvenile female Blackbird was observed to have a swollen joint on the mid-digit of the right foot, with fixation of the joint; it is considered that this lesion was associated with a directly traumatic factor. Distortions of the tarso-metatarsal bones due to healing fractures were also noted in a captured adult Blackbird and a Starling.

(7) MISCELLANEOUS CONDITIONS OF UNCERTAIN ETIOLOGY

Three main conditions can be placed under this heading, namely certain types of alopecia or baldness, articular gout, so-called congenital abnormalities, and certain types of claw and bill deformities.

*Alopecia of unknown etiology*

Seventy-four specific records concerning alopecia, especially of the head, comprised 32 Blackbirds, 23 Starlings, six Robins, three House Sparrows, three Dunnocks and one each of Blue Tit, Great Tit *Parus major*, Chaffinch, Pied Wagtail *Motacilla alba*, Greenfinch *Carduelis chloris*, Song Thrush *Turdus philomelos* and Mallard *Anas platyrhynchos*.

Of the 32 Blackbirds, only one was received for laboratory examination. This showed a loss of feathers from the dorsal surface of the neck, the shoulders and under each wing. The denuded skin appeared to be inflamed and the bird carried a very heavy unidentified louse infestation, which was probably the primary cause of the condition. Four other Blackbirds, which were recorded as having lost feathers from the head, neck and back, had also been observed to exhibit signs of intense skin irritation. It is suggested that these may also have been suffering from a severe ectoparasite burden. Two of these birds grew normal feathers again the next autumn. Two more Blackbirds, apart from losing almost all the feathers from the head, developed a thickened skin which had a white scaly appearance similar to that of birds confirmed to be suffering
from a cutaneous mycotic infection. A hand-reared Blackbird, after losing its juvenile feathers, never grew adult plumage on the head; this condition may have been in some way associated with its artificial environment or nutrition. Of the 24 remaining Blackbirds, all showed loss of head feathers, five an associated loss of neck feathers, two of back feathers and one of breast feathers. Of those whose sex was recorded, 14 were males and five females.

Seven Blackbirds, including two of those which were thought to be affected by ectoparasites, were noted to re-grow feathers in the autumn (October-November), but then three of them were observed to lose feathers again within a few months: two in early spring (February and March) and one in December. Dr Geoffrey Beven (in litt. 1968), who has observed Blackbirds affected by this type of affliction, believes it to be most common during the late summer months, and this opinion is shared by Stanley Cramp (verbally 1964) and by I.F.K. from observations in the field. The condition, however, of one bald Blackbird remained completely unchanged for at least two years. Another interesting observation concerned a pair of breeding Blackbirds which both lost their head feathers, but the female did not become affected until she had paired with the already affected male.

All 23 Starlings showing loss of head feathers were observed by Dr Beven while trapping birds in the Esher and Morden areas of Surrey. These observations are therefore highly selective and may suggest an unrealistic incidence of this condition in Starlings. All simply lost head feathers and showed no obvious deformity of the exposed skin (although in two cases the remaining plumage was noted to be in rather poor condition) and in ten cases the loss of feathers was confined to the base of the bill. There was no obvious sex, age or seasonal incidence amongst the affected birds.

Four of the Robins had varying degrees of loss of feathers upon the head and one also exhibited loss of neck feathers. One observed by I.F.K. had lost only the feathers from around both eyes, and the alopecia was associated with irritation of the affected skin. Another observer recorded that for three consecutive years one young Robin from each brood of a particular pair became bald when two or three months old.

Two of the House Sparrows showed loss of head feathers only, whilst the skin of the head of the third had a white scaly appearance with similar lesions on both wings rather suggestive of a cutaneous mycosis. The Chaffinch, which was observed for four months, developed a progressive baldness with associated thickening of the skin; the records of Blue Tit, Great Tit and Pied Wagtail were similar. The Greenfinch, which was wild caught but had been kept in captivity for one month owing to a damaged wing, developed loss of feathers around one eye and the side of the face, with an associated scaly thickening of the
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skin; a local veterinary surgeon who examined the bird suspected knemidokoptic mange.

One interesting report from Mrs A. Carney (in litt. 1967) involved a Dunnock which gradually lost the feathers of its head and neck until by mid-summer 1966 the alopecia had spread to the breast; at first the skin was pinkish, but eventually that of the head turned greynish. The feathers then began growing again until by mid-October the plumage was normal. About two weeks later, however, a whitish horny growth started to develop around the left eye; this later appeared to obscure vision and gradually spread across the head to affect the other eye. The Dunnock started to scratch the lesion, became very aggressive to other birds and was seen to attack a Robin in January 1967. Progressive loss of feathers recurred and the affected skin developed horny ridges; the bird eventually became blind as a result of the lesions obscuring the eyes and was found dead on 21st January. Unfortunately, the carcase was not submitted for examination.

The Mallard, an adult drake, was observed on a lake in Greenwich Park. It was in poor plumage, with areas of feather loss and general signs of skin irritation, especially around both eyes. Some parts of the skin were denuded of feathers, and obviously thickened. It is thought that a severe ectoparasite infestation could have been a possible cause of this condition.

Several other letters were received from evidently reliable observers who recognised baldness in Blackbirds, Robins and tits as a relatively common occurrence, but did not quote specific examples. These observations of birds with varying degrees of alopecia are difficult to classify, but in certain cases it is possible to make a tentative diagnosis. As already suggested, five Blackbirds and the Mallard could have been affected by a heavy burden of ectoparasites, particularly lice or feather mites. The Greenfinch might have been suffering from knemidokoptic mange. It has now been shown that mycotic skin infections definitely occur in British wild birds. Of those with alopecia described here, two Blackbirds, four Robins and one each of House Sparrow, Chaffinch, Blue Tit, Great Tit, Dunnock and Pied Wagtail could have been suffering from a mycotic dermatitis.

Articular gout

Two cases affecting Woodpigeons were investigated. One, which was very severe, was associated with nephrosis or nephritis of unknown etiology. Almost all the limb joints contained considerable deposits of urate material, especially the humero-ulna joints and the tibio-tarsal tarso-metatarsal joints. The white, grossly swollen joints were conspicuous in the unfeathered regions before dissection (plate 56b). The feet and legs of the second Woodpigeon, which had been trapped near Fordingbridge, Hampshire, were grossly swollen as a result of heavy
subcutaneous deposits of urate material, these extending up the tarso-metatarsus and also involving the tendon sheaths. A post-mortem examination by another laboratory had revealed tubercular nodules in the liver and spleen, and a fibrinous pericarditis. Unfortunately, the kidneys were not examined, but presumably this classical case of articular gout was either associated with an unobserved tubercular nephritis or a secondary nephrosis.

Articular gout in wild birds appears to be rare and the only other report we have been able to trace affected a male Black Grouse *Lyrurus tetrix* in Sweden (Hülphers and Lilleengen 1948).

**Suspected congenital abnormalities**

During the present survey no deformities of congenital origin were recognised. Congenital abnormalities must be regarded as rare and, unless they are detected in recently hatched birds, they are almost impossible to diagnose. Pomeroy (1962), however, considered that one of the main causes of bill deformities in birds was genetic in origin, and Lockley and Dane (1954) reported what were undoubtedly congenital abnormalities in a young Gannet *Sula bassana*.

I.F.K. suggested, on the basis of a photograph, that foot deformities in an Oystercatcher *Haematopus ostralegus* seen by Walton (1962) could have been congenital, but later Dare and Mercer (1968) confirmed the suspicions of Boer (1967) that lesions of this kind in Oystercatchers are probably caused by injury inflicted by sheep’s wool. Clearly, extreme care is necessary before diagnosing congenital abnormalities in wild birds, as it is unlikely that most individuals affected in this way would ever reach maturity. The difficulties of diagnosing the cause of any skin condition in birds without laboratory examination cannot be too strongly emphasised; even accumulations of pollen adhering to the bills of small passerines (Ash 1959, Ash *et al.* 1961) may be mistaken for disease.

**Claw and bill deformities**

Apart from the claw deformities recorded as secondary to other primary diseases, such as papillomatosis of Chaffinches, the comparatively few records received of primary beak and claw abnormalities all concerned Starlings caught in the Esher and Morden areas of Surrey by Dr Geoffrey Beven. Two adult Starlings were noted to have excessively worn claws, and eight to have deformed beaks. In two cases the lower mandible was a few mm longer than the upper, and in five others the upper mandible was longer than the lower; in two of these the deformed beak was also curved downward and in another was excessively broad. In the last case the complete beak was approximately twice its normal length and curved downward. The causes of bill deformities were well reviewed by Pomeroy (1962).
DISCUSSION

Any interpretation of the results of this type of survey has to be treated with caution. Although several interesting facts and impressions emerge, it must be emphasised that there is little, if any, statistically significant information concerning the relative incidence of skin diseases in different species. Although 153 different cases are described here, this number is very small compared with the total population of British birds. The majority of the records relate to the smaller garden birds, creating an unrealistic dearth of information concerning the larger species, such as crows, pigeons and game-birds. At the same time, while the general standard of recorded observation was extremely high, the precise diagnosis of any disease can be achieved only by a detailed laboratory examination. Unfortunately, very few birds suffering from skin or feather abnormalities were sent for detailed pathological study. In spite of these limitations, an attempt has been made to classify the different conditions into broad categories. This classification was based on the information gained in the laboratory on a particular disease syndrome, and the degree of information contained in a specific field observation. From these correlations, several interesting and important facts have emerged.

Of the known infectious skin diseases, it appears that pox is a relatively common condition of House Sparrows, and possibly of other small passerines. This survey irrefutably establishes that fungal infections of the skin of wild birds do occur, although the species of fungi responsible have not yet been precisely identified. Although only seven cases were definitely established to be cutaneous mycoses, twelve others strongly suggested a similar condition; it is also of interest that, of these 19 records, almost a third involved Robins. Of the diseases which are specific to particular birds, the squamous papilloma of the feet of the Chaffinch is of particular interest and appears to be relatively common in this species. It is surprising that so few cases were classified under the heading of injuries, as trauma is usually considered one of the commonest hazards to which wild birds are subjected. It is possible that some of the cases of alopecia of unknown origin may have been associated with a previous trauma.

The most difficult group of conditions to classify in a logical manner was that referred to as alopecia of unknown origin. Although the observations described a definite loss of feathers, there was often no information concerning the nature of the areas of denuded skin. It is possible that some of these cases could have been related to a normal seasonal moult, or to a hormone disturbance, especially as some of these apparently abnormal cases of feather loss appeared to have a seasonal incidence. In spite of these reservations, it is of interest to note that 32 of the 74 cases of alopecia of unknown origin involved Blackbirds (only one of which was received for laboratory examination).
Although the results are subject to certain limitations, it is hoped that this survey has helped to elucidate certain of the problems related to the skin diseases of wild birds. At the same time it may stimulate others to investigate in greater detail such important problems as cutaneous mycoses and the causes of alopecia of wild birds in general, and of Blackbirds in particular.

ACKNOWLEDGEMENTS

We are extremely grateful to all who sent us records or specimens of affected birds—without this information, the work could not have been done—but the number of people involved unfortunately makes individual acknowledgement impracticable. We are also most grateful to Petfoods Limited, of Melton Mowbray, and the Zoological Society of London for providing facilities for us to carry out this work.

SUMMARY

This paper records the results of a small survey of the cutaneous diseases of British wild birds, being based on data and pathological specimens received as a result of a previous review article and request for further information published in 1964. A total of 153 cases, involving 24 species, were investigated and an attempt made to classify these under various broad headings according to their probable etiology.

Of the conditions classed as infectious, bacterial diseases were the least common, apart from secondary staphylococcal infection of foot wounds; and cutaneous lesions of avian pox apparently the most frequent, particularly among House Sparrows *Passer domesticus*. Knemidokoptic mange was the most significant ectoparasitic condition. Seven cases of cutaneous mycosis were confirmed and this is considered a particularly interesting finding. The commonest neoplastic condition was the squamous papilloma of the foot which appeared to be specific to the Chaffinch *Fringilla coelebs*. No less than 74 cases, involving twelve species and including as many as 32 Blackbirds *Turdus merula*, were classified under alopecia of unknown origin; in these, the lesions were confined mainly to the head and neck.

The various conditions recorded are discussed to show which are considered to be of special interest and which require further investigation.

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PLATE 54. Above, blister on the web of a Common Gull Larus canus, probably caused by puffinosis (page 320). Below, cutaneous tubercular lesions (shown arrowed) on the under surface of the right wing of a Kestrel Falco tinnunculus: multiple round and ovoid tumour-like masses up to 3 cm in diameter (page 316) (photo: P. Hanney)
Plate 55. Above, localised cutaneous fungal infection upon the wing of a captive Bullfinch *Pyrrhula pyrrhula* (page 321). Below, typical 'scaly leg' due to a mite *Knemidokoptes mutans*, affecting both legs of a Pheasant *Phasianus colchicus*: the swollen legs have yellow encrustations, with distortions of the scales (page 322)
Plate 56. Above, Pheasant *Phasianus colchicus* with a heavy infestation of ticks around the eyes, looking like warts (page 322) (photo: P. K. C. Austwick). Below, leg of Woodpigeon *Columba palumbus* showing lesions of articular gout: urates are deposited under the skin and around the joints, forming white swellings (page 327)