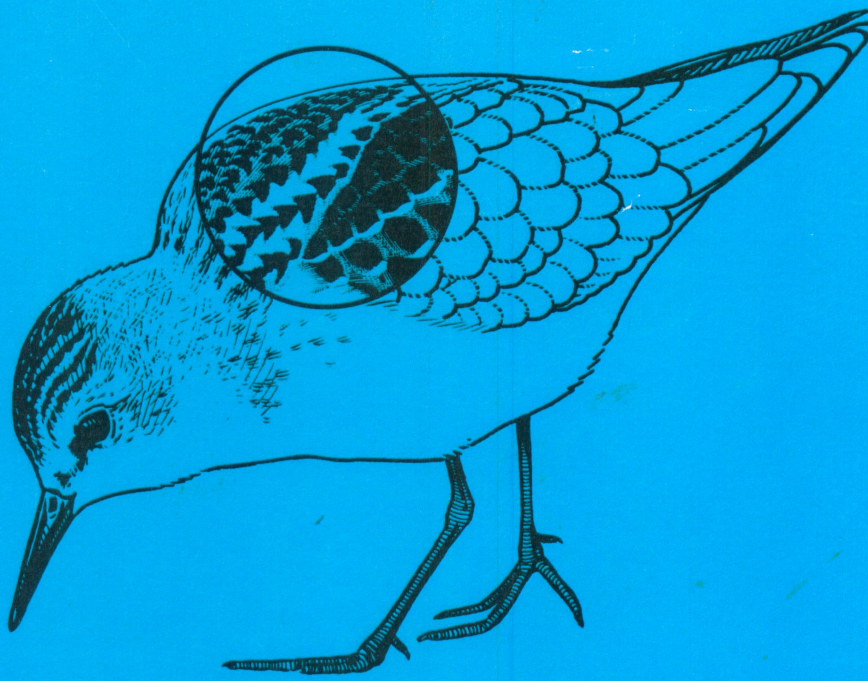
The NEW APPROACH to identification



Peter Grant & Killian Mullarney

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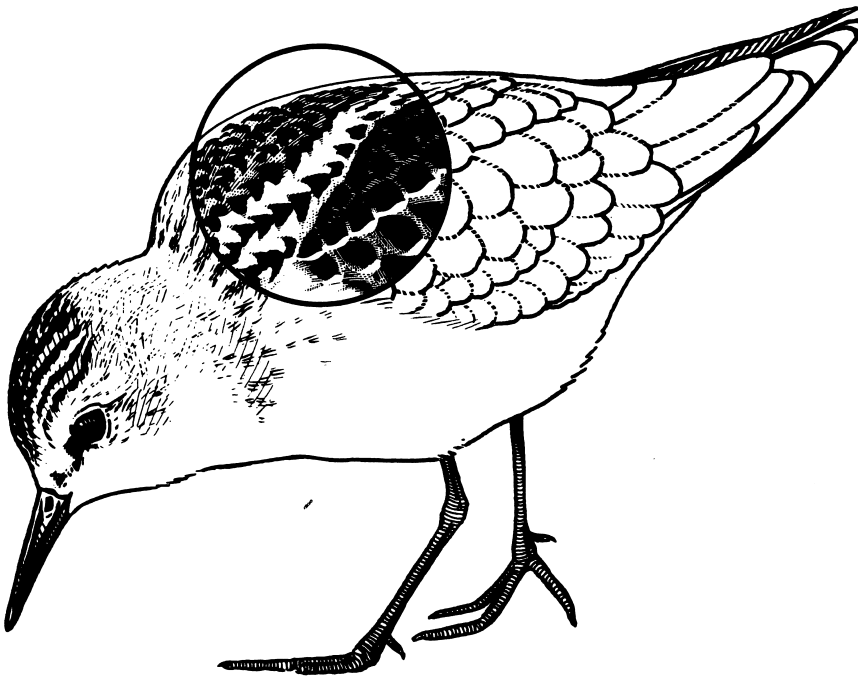

Peter Grant & Killian Mullarney

The NEW APPROACH to identification

CONTENTS

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Illustrations by Killian Mullarney

Front cover: juvenile Little Stint

The NEW APPROACH to identification

INTRODUCTION

Listen to any conversation these days about some identification topic, and it's likely that the talk will involve such things as tertials, first-summer plumages or primary-projections. If you don't know the difference between an orbital ring and an eye-ring, or scapulars and greater coverts, you will certainly feel left behind when it comes to the modern trends in bird identification.

In fact, recent years have seen a considerable and rather rapid revolution in identification. A whole "New Approach" has developed which adds new skills to traditional techniques. This New Approach is based on a thorough knowledge of bird topography and moult, as well as other related subjects and techniques. It places emphasis on plumage detail and firm structural differences. Close views, often with the aid of a telescope, are essential. The same approach can also be applied to good photographs of problematic birds.

With the traditional techniques, an extremely high level of expertise can be obtained without ever knowing about primary-spacing or post-juvenile moult. The traditional techniques rely on obvious plumage marks, and depend much on the experienced judgment of such things as size, shape, posture, voice, and flight or feeding actions. The traditional skills will always be the means by which the great majority of birds are identified, but the problem is that these often subjective judgments are notoriously inadequate when it comes to very difficult pairs or groups of species.

The New Approach, on the other hand, has developed specifically to deal with these tricky identification problems. It is also used by today's expert birders to do more than that. For common and rare species alike, it is used to take identification much further than just naming the bird. It allows precise descriptions to be taken, and enables much more to be told about such things as a bird's sex, age, state of moult, or degree of plumage wear. These things often also help to explain otherwise confusing or misleading

variations. Rarities are scrutinised for subtle differences which reinforce the well-known ones, providing a fail-safe approach which inhibits mistakes. Further, it allows the latest identification literature to be understood, practised and improved. In total, it brings new fields of precision and study to the traditional skills, and adds a great deal of extra interest to the identification of birds.

The New Approach to identification first appeared as a series of articles in the monthly magazine *Birding World*. By explaining and illustrating the terminology and expert techniques involved, *The New Approach to identification* provides an essential foundation for the improvement of identification skills.

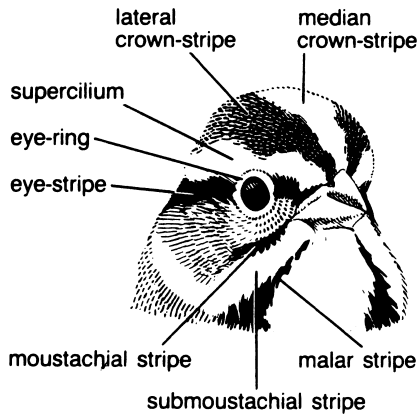
ACKNOWLEDGEMENTS

The authors would especially like to thank Juliet Bloss, Steve Gantlett, Richard Millington, Chris Powell, David Rosair and Joanne Thomas for reading first drafts and suggesting amendments and additions which greatly improved the published versions; also Lars Svensson for permission to reproduce his drawings in Part 6.

1 Heads

The head often contains important field marks which need to be accurately described. Learn the names of the various features. Practise locating and naming the features on photographs, good illustrations, or in the field on common as well as rare species. For birds that do not have these specific plumage marks, describing the head pattern requires knowing the correct names for the general areas of the bird's head, such as the forehead, ear-coverts, lore and so on: these general areas are covered in Part 2. When discussing field characters, taking field notes or compiling written descriptions, make a point of always using the standard terminology. This encourages precision, careful observation and unambiguity, essential when it comes to difficult identifications.

HEAD: plumage marks



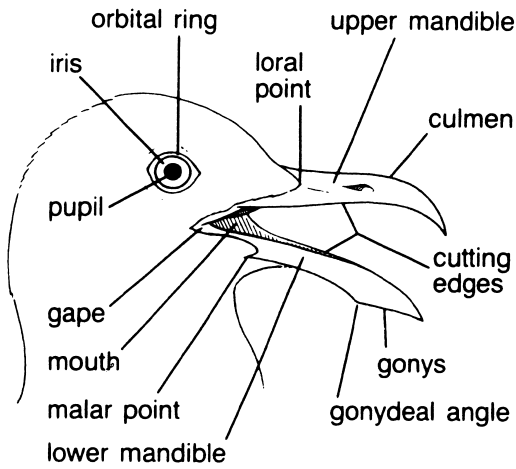
PLUMAGE MARKS

The *supercilium*, *median crown-stripe* and *lateral crown-stripe* are important identification features on many birds. The *eye-stripe* can be a continuous mark from the bill to the nape, or confined to behind or in front of the eye. When confined to in front of the eye, the mark is referred to as a *loral stripe*. The *eye-ring* is a feathered ring surrounding the eye: it can be complete, broken (*eg* forming separate crescents above and below the eye), or partial (*eg* a single crescent above or below the eye). A *moustachial stripe* forms the lower edge of the ear-coverts and originates at the gape; it is bordered below by the *submoustachial stripe*; the *malar stripe* originates at the malar point. The length, strength, shape or colouration of the various head markings are important and need to be precisely described.

BARE PARTS

The *pupil* is always black. The *iris* is either dark (thus the whole eye appears dark) or coloured. The *orbital ring* is the bare, fleshy ring immediately surrounding the eye. It is present on all birds, but on most species it is thin, dark and practically invisible, while on others it is thicker, contrastingly coloured and obvious. Take special care to differentiate between the orbital ring and eye-ring (the latter being the feathered ring that immediately surrounds the orbital ring). The *gape* is the fleshy "hinge" at the joint of the *upper mandible* and *lower mandible*, and it is often swollen, coloured and obvious on recently-fledged juveniles. The *mouth* is the fleshy interior of a bird's bill, and is often distinctively coloured. The *culmen* is the ridge along the top of the upper mandible from forehead to tip. The *gonys* is the ridge from the *gonydeal angle* to the tip (the "seam" which joins the two lateral plates of the lower mandible). These and the other labelled features on the bill enable the shape, pattern and structure to be precisely described and (as described in Part 7) some are important for allowing critical comparative measurements to be accurately taken in the field or, especially, in photographs.

HEAD: bare parts



2
Passerine topography

All birds have the same feather tracts. Therefore all the features labelled on the passerine topography charts can also be found on very different species such as a Coot, Gannet or Flamingo.

What does vary from one type of bird to another, however, is the number of feathers in a particular tract (*eg* the number of primaries, secondaries, tertials or tail feathers), or the development of a particular tract (*eg* the number of rows of lesser coverts, or the extent of the area covered by the scapulars). Taking two extreme examples, a passerine has many fewer secondaries than an albatross, and its uppertail-coverts are much less prominent than those which form the showy "tail" of a peacock.

For the purposes of the New Approach, it is not necessary to learn the many variations. It is sufficient to be aware that they can occur, and when necessary the details can be obtained from specialist reference books.

One important variation, however, is the difference in the arrangement of the feather tracts on the wing between a passerine and a long-winged non-passerine such as a wader, as explained in Part 3.

It should be noted that the terminology used in the New Approach is the standard terminology, and is used in topography charts in most new field guides and identification books. Beware that many charts in older books (and unfortunately also some of the latest) use non-standard terminology, and are often incompletely and inaccurately labelled.

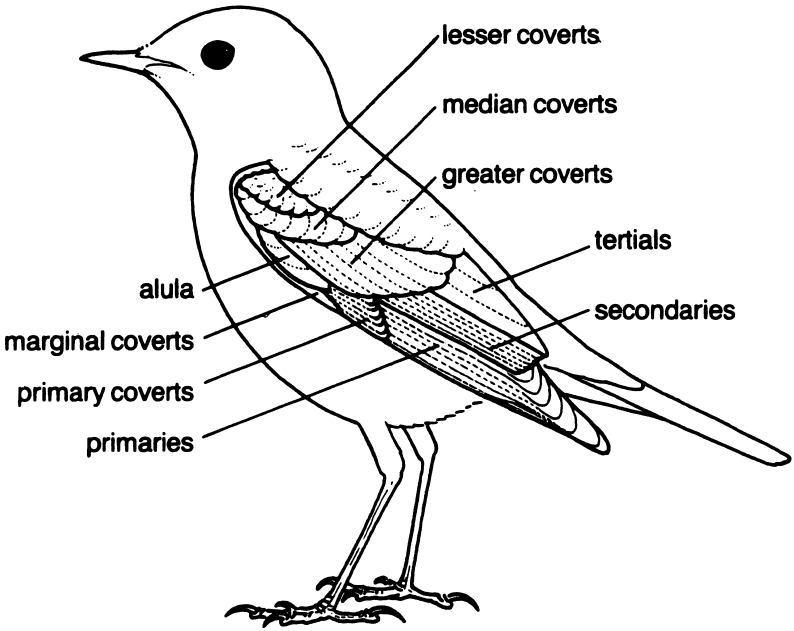
PASSERINE TOPOGRAPHY

All passerines have basically the same topography. One variation worth special note, however, is that larks, pipits and wagtails have long tertials which partially conceal the secondaries and reach (depending on the species) to or nearly to the tips of the primaries (Fig 1).

Total familiarity with topography is absolutely essential to the New Approach: little can be done without it. On the passerine charts (and on the wader charts in Part 3), thoroughly learn the various plumage areas and feather tracts, so that they can be instantly located and named. Those on the wing are especially important.

Do not start this learning process only by trying to memorise the labels on the charts. Instead, use good magazine or book photographs in conjunction with the charts, and start by locating and naming the feather tracts on the wing. The features elsewhere on the bird are more logical and easier to learn. Examples of such photographic exercises are on pages 8–9.

PASSERINE: wing-feather tracts



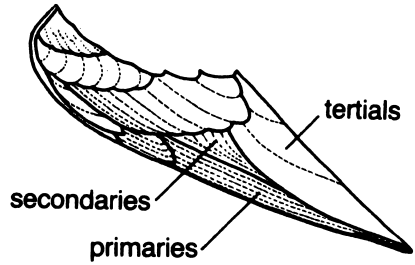
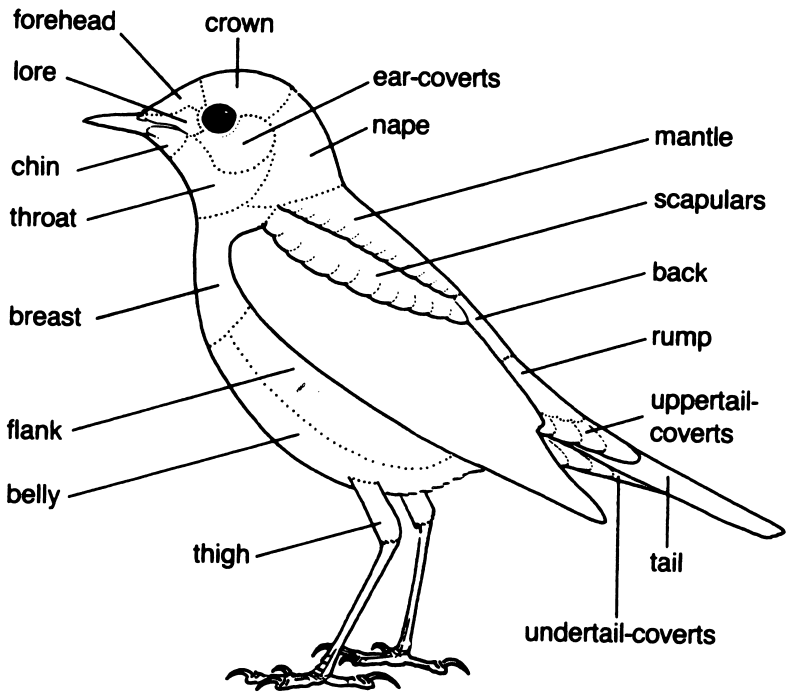


Fig. 1: Wing of typical lark, pipit or wagtail, on which tertials partially cover the secondaries and reach to, or nearly to, the primary tips

PASSERINE: body-plumage tracts



EXAMPLES

In the photograph of the adult winter male Stonechat, the marginal coverts are concealed (beneath the breast feathers and alula), but all of the other feather tracts on the wing are visible: the *tertials* (three on most passerines) on this bird are blackish-centred with neat pale fringes; the *secondaries* (six on passerines) are also pale-fringed and form the solid pale panel below the tertials; the *primaries* (ten on passerines, the outermost one sometimes tiny) are blackish with very fine pale fringes; the *primary coverts* can be seen projecting from below the outer greater coverts; the edge of one of the three *alula* feathers is only barely visible, alongside the base of the outermost greater covert; the *greater coverts* form the broad tract across the wing, the pale tips aligning to form the noticeable wing-bar and the white innermost ones forming a prominent patch; the black centres of the rounded *median coverts* form the row of dark spots above the greater coverts; and the *lesser coverts* form the triangle of very small, pale-fringed feathers at the carpal joint. At least one row of *scapulars* is visible, appearing as a line of large, dark-centred feathers running from the shoulder to the tertials between the wing-coverts and the dark-streaked *mantle*.

In the Blackstart photograph, the greater coverts are less spread, thus revealing more of the primary coverts and the outer two (of the three) alula feathers (the largest black and prominent, the other mainly grey). As on the Stonechat, the tertials, secondaries and primaries are clearly discernible, but because of the plainness of the Blackstart's plumage it is not possible to see clearly the boundaries between the various wing-covert tracts, scapulars or mantle.

DISCUSSION

Practise such exercises on many different photographs, in order to gain total familiarity with bird topography so that the same thing can be done with good views of birds in the field. This is vital for taking precise descriptions, as well as for applying detailed identification and ageing criteria, all of which are essential skills in the New Approach. Other useful exercises for learning topography are studies of birds in the hand (such as those caught for ringing) or of freshly dead birds, identifying the various feather tracts and, especially, noting how a wing opens and closes, and as it does so which feather tracts are revealed or concealed (a topic more fully covered in Part 4).

Photographic exercises such as these will demonstrate many positive points, such as the prominence of the tertials especially if they are pale fringed; or that it is pale tips on the greater coverts and median coverts which align to form the two main wing bars on many passerines; or that the upper wing bar (on the median coverts) can be hidden by overlapping body feathers. They will also demonstrate how other prominent field marks are produced by patterning on other feather tracts, such as a pale bar across the secondary bases, or patches on the lesser coverts or at the base of the primaries. The plumage marks of birds are highly varied, and the ability to precisely describe their position on a specific feather tract is very important.

Adult winter male Stonechat, Eilat, Israel, December 1987 (*Paul Doherty*)

Blackstart, Eilat, Israel, December 1987 (*Paul Doherty*)

Photographic exercises will also demonstrate some difficulties. For example, if the plumage is plain or highly worn it may be impossible to pick out onefeather tract from the adjacent one; or, if a tract is disarranged or has feathers missing (as is often the case, through moult or accidental loss), it may be difficult to sort things out. It is important to be able to recognise such limitations and discrepancies, which could otherwise be confusing.

Skills acquired by photographic exercises can be readily applied in the field; thorough knowledge of topography, and the ability instantly to locate particular feather tracts or individual feathers is the essence of the New Approach. It enables many seemingly amazing identification feats. Identification or ageing criteria can be used which previously would have been thought impossible on birds in the field. Taking just two examples from Lars Svensson's *Identification Guide to European Passerines* 3rd edn., it is possible (given excellent field views or good photographs) to tell whether a brown autumn Pied Flycatcher is a first-winter or adult by the pattern of its central tertial; or whether the pattern of the largest alula feather indicates Short-toed or Common Treecreeper.

Equally important is an awareness of limitations: for example, the reddish-brown lesser coverts of a Reed Bunting rather than the greyish-brown ones of Little Bunting are impossible to see if, as is often the case on passerines, the carpal joint is covered by breast-side feathers and scapulars.

3 Wader topography

As mentioned in Part 2, it is important to know the difference between passerine topography and that of long-winged non-passerines such as waders, gulls, terns, herons etc. Firstly, note that the secondaries and the whole of the outerwing except the primary tips are concealed when the wing is fully closed (the mechanics of how the wing opens and closes to produce this difference are explained in Part 4). Secondly, note that the scapulars are more extensive and (if they are patterned rather than plain) stand out much more clearly as a separate tract of feathers.

The most important tracts to learn are the mantle, upper and lower scapulars, tertials and the three tracts of innerwing coverts, because these usually contain most identification and ageing features.

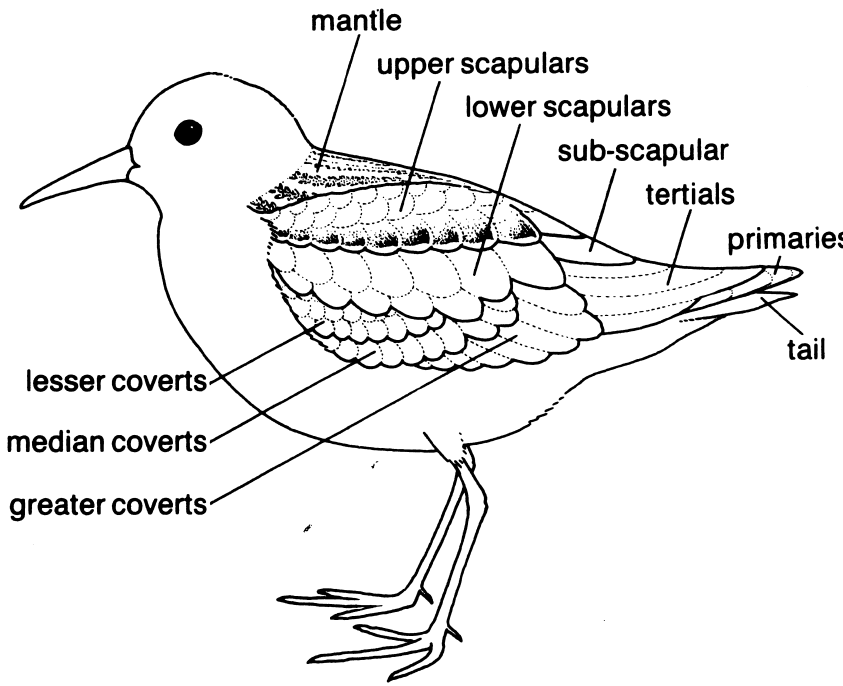
As with passerines, use photographs in conjunction with the charts. For a start, close-up photographs of juvenile stints (*eg* the Little Stint on page 14) are ideal, because the important tracts are neatly patterned and thus well demarcated.

Always work forward from the rear end, noting the projecting tips of the ***primaries***. On stints, depending on species, the primary-projection can be long, short or entirely lacking and this can be an important identification pointer. The primaries project beyond the ***tertials***, of which waders have four. Forward of the tertials are the three rather horizontal, curved tracts of innerwing coverts: first the ***greater coverts*** (one row), next the ***median coverts*** (one row), then the ***lesser coverts*** (several rows, but on the closed wing most are usually covered by the scapulars). Overhanging the coverts are the two rows of ***lower scapulars***, the lower of which is often largely overlapped by the upper row. Note that the roughly horizontal division between the scapulars and coverts is best discerned by the larger size of the scapulars against the much smaller lesser coverts and narrower median and greater coverts. The ***upper scapulars*** (three rows, the upper one small and often concealed by the overlapping mantle feathers) lie between the lower scapulars and the mantle; the upper scapulars on juvenile stints are dark-centred with more or less rufous fringes, and they often stand out as the darkest tract of feathers on the upperparts.

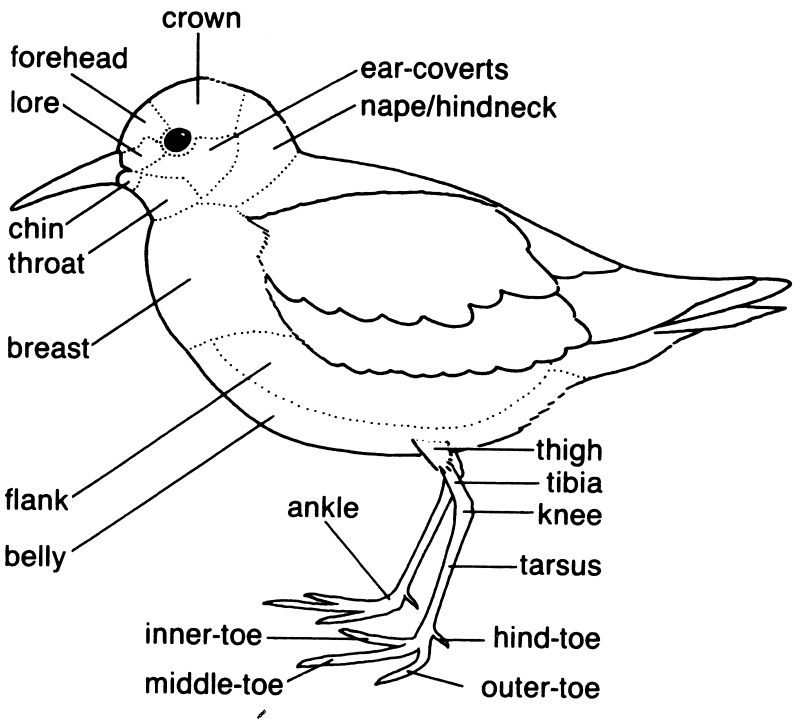
On some waders the ***mantle*** has a white line on each side, converging to form the "mantle V" (*eg* juvenile Little Stint). White outer fringes on the lowest row of upper scapulars align to form the usually less prominent "scapular V".

A single row of *sub-scapulars* lies usually concealed under the rear lower scapulars: the rearmost, largest sub-scapular is often visible on a standing wader, and can be especially obvious when the rear scapulars are hung down or missing through moult; on most species it appears as a pointed, dark-centred and sharply white-fringed feather in the position indicated on the chart. Take care not to mistake it for the innermost tertial which it sometimes almost covers.

WADER: mantle, scapulars and wing



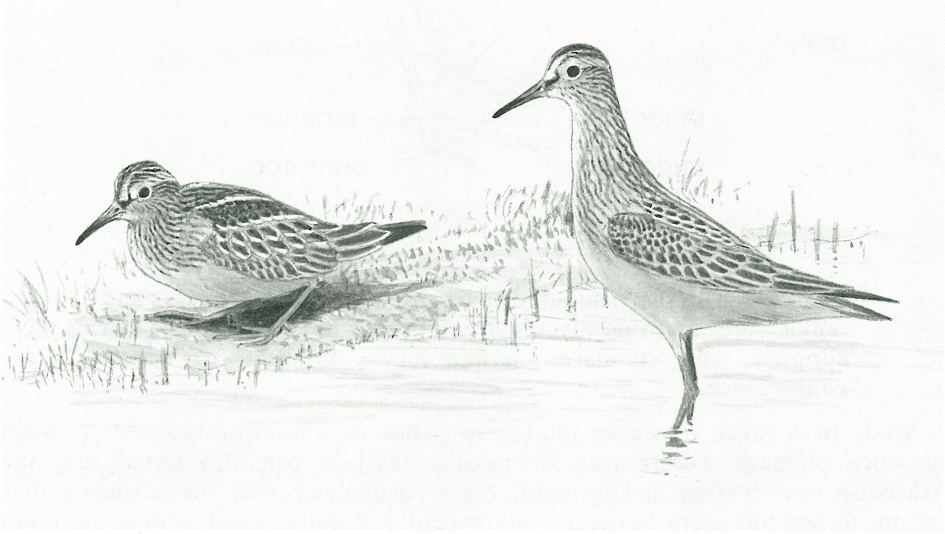
WADER: head, underparts and leg



The "thigh" (the feathered part of the tibia), "knee" and "ankle" are anatomically incorrect terms, but they have been adopted in standard terminology because of their convenience.

Study of a range of wader photographs reveals limitations caused by plain or worn plumage. Disarranged or missing feathers can also complicate the otherwise neat feather arrangement. Note particularly that the scapulars may be positioned anywhere between fully spread and fully raised concealing more or less of the innerwing coverts, (as illustrated on the juvenile Pectoral Sandpipers on page 14).

Juvenile Little Stint, Attu, Alaska, September 1983 (*Gerald Maisel*). Locate the important tracts on the upperparts and wings, as described in the text.



Juvenile Pectoral Sandpipers, with scapulars spread (left) and scapulars raised (right).

4 Wings

The feather tracts on the wing are often important in identification and ageing, so it is essential to be able to locate and name them accurately. Part 4 covers various definitions and explanations which will assist a thorough understanding of wing topography.

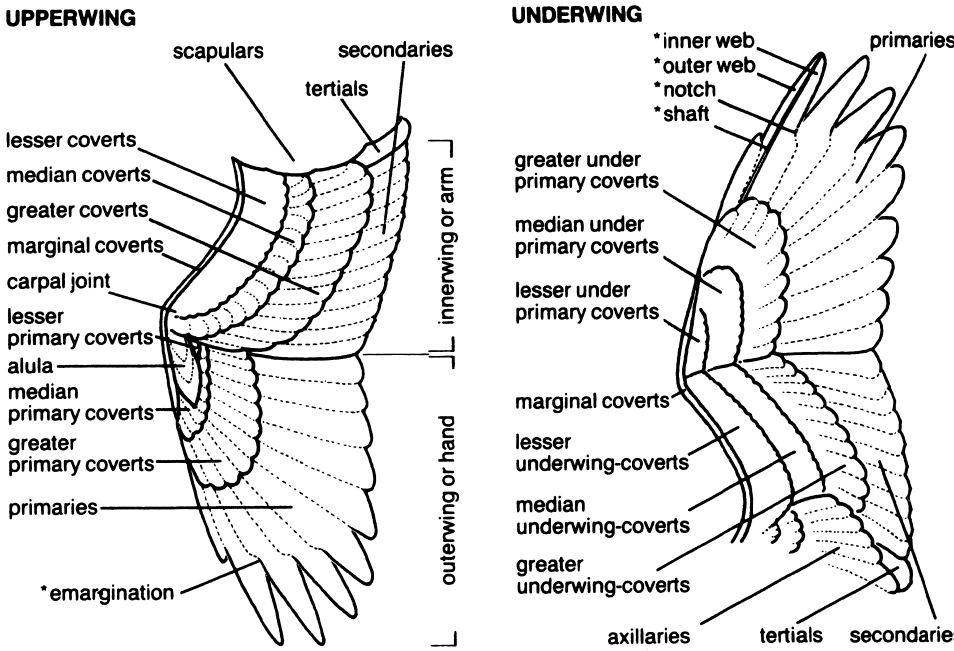
UPPERWINGS AND UNDERWINGS

Every feather tract is labelled on the charts. It is often convenient, however, to use a single term which combines several tracts, such as "underwing coverts", "upperwing coverts", "innerwing coverts" etc. The primaries and secondaries together are called the "remiges".

The five features (marked *) of an individual feather are also included: all feathers have a ***shaft***, ***inner web*** and ***outer web***, but only the outer primaries can have a ***notch*** (the point at which the inner web begins to broaden) and an ***emargination*** (the point at which the outer web begins to broaden). Notches and emarginations produce the prominent "fingers" on soaring birds of prey, and on passerines (especially warblers) their position and which primaries have them can be important identification features.

The upperwing feathers overlap outwards, except the median coverts. Thus it is mostly the outer web of each feather which is visible. The primaries and secondaries form a single layer, thus the same feathers are visible from above or below, but because the feathers overlap outwards it is mostly the outer web of each feather that is visible from above, and mostly the inner web from below. Thus, because an adult Little Gull has pale grey outer webs and mainly blackish inner webs, the remiges show pale grey above and blackish below, despite the fact that the same feathers are involved. On most species, for the same reason, the pattern and colouration on the upperside of the remiges is different from that on the underside.

The ***alula*** consists of a separate "flap" of three feathers (the innermost small, the outermost large) on the anatomical equivalent of the thumb. On the closed wing of a passerine, it is positioned alongside the outer greater covert. If the greater coverts are spread, they cover the alula, but when they are raised (as is typically the case) the usually dark largest alula feather stands out as a prominent feature.



The *axillaries* form, for example, the distinctive black wingpit on a Grey Plover. Note that as the wing closes, the axillaries fold down and are spread flat against the side of the body facing outwards, underneath the folded wing. They can be seen in this position even if the wing is only slightly opened or moved, as when preening. Thus it is not always necessary to wait until the wing is fully opened to see the distinctive axillary colour of, for example, wigeons (white on American, grey on Eurasian) or golden plovers (grey on American and Pacific, white on European). On passerines, the axillaries often project from beneath the folded wing at the side of the breast, forming a usually contrasting pale tuft called the "axillary flash", for example the whitish flash on a Robin, or the bright lemon-yellow flash on a Willow Warbler or Chiffchaff.

The *marginal coverts* are the tiny feathers which form a narrow tract along the extreme leading edge of the wing from the body to the base of the primary coverts, for example the white leading edge prominent on many adult gulls. On passerines they are usually concealed when the wing is closed, because the carpal joint is tucked into the breast-side feathers. On the outerwing they are also often covered by the alula, but at other times they are visible as a sometimes contrasting streak of colour at the edge of the wing between the alula and the base of the primary coverts, for example the bright lemon-yellow streak on a Willow Warbler or Chiffchaff. It is important to distinguish between the marginal coverts and the rather similar, but usually differently positioned, axillary flash.

WING "MECHANICS"

It is important to understand the mechanics of how wings open and close and, as they do so, how the relative positions of the various feather tracts change, and how some feather groups become concealed when the wing is closed. Both of these aspects differ from one group of birds to another, but knowing the variations exemplified by the three main types described below should, with some interpretation, enable the wing mechanics of all birds to be understood. It is a useful exercise to study birds in the hand or freshly dead birds, noting how the wing opens and closes, and as it does so which tracts are revealed or concealed.

Passerines

Fig. A shows that on passerines all the upperwing tracts potentially remain visible when the wing is closed. Much depends, however, on the extent to which the wing is then tucked into and covered by the breast – side, flank and scapulars: usually, only the marginal and lesser coverts are concealed, but it is possible for only the primaries, secondaries and tertials to remain visible, especially when a bird is resting or asleep.

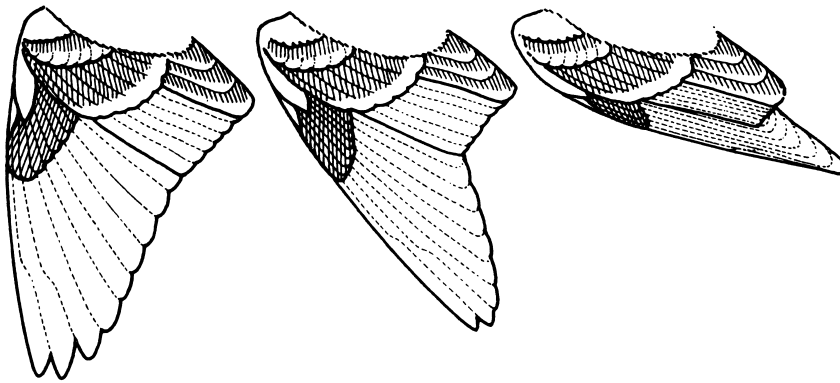


Fig. A

Waders, gulls, terns

Fig. B shows that the outerwing folds beneath the innerwing, so that only the primary tips remain visible. Importantly, note that the secondaries fold beneath the greater coverts and also become totally concealed: ignorance of this fact leads all too often to the greater coverts mistakenly being called the secondaries (and consequently the misnaming of all the innerwing coverts). An obvious example by which this important point can be remembered is that a Redshank's white secondaries, so obvious in flight, become totally concealed on the standing bird. The tips of the secondaries become visible, however, if the wing is only slightly opened or relaxed (for example, the white secondary tips occasionally show as a thin white line

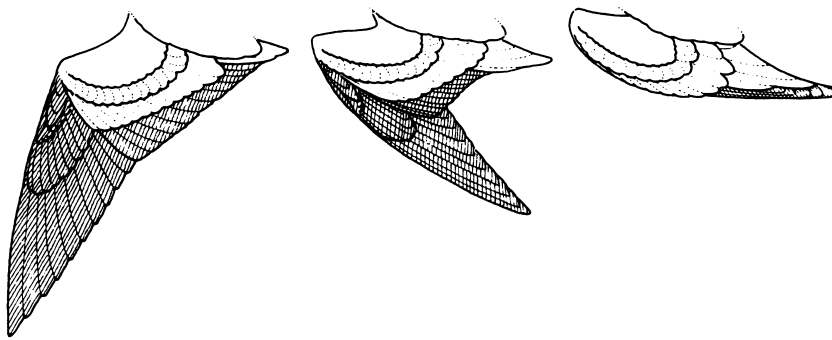


Fig. B

below the greater coverts on an adult Herring or Great Black-backed Gull) or when some of the overlying greater coverts are missing or moulted. The tertials can be fully concealed by the scapulars when the wing is fully spread, and become exposed only as the wing is closed.

As with passerines, much of the wing can also be concealed by overlapping body feathers and (especially on waders, as illustrated in Part 3) by the ability to spread the scapulars. Swimming waders, gulls and terns habitually cover much or all of the innerwing coverts in this way, so that often only the tertials , greater coverts and primary tips remain visible.

Ducks, geese

The flank feathers and scapulars form thick pads beneath which much of the wing is concealed when the wing is folded. On ducks, often only the tertials and primary tips remain visible, but if the scapulars and flank feathers are slightly parted, the sometimes distinctively coloured innerwing coverts are revealed, for example showing as a thin white line often visible on the side of an adult male wigeon.

On geese, the scapular feathers are short and do not cover such a large area as they do on ducks, so that at least the greater and median coverts remain partly visible. Unlike on waders, gulls and terns, the secondaries on ducks and geese are not fully concealed beneath the greater coverts when the wing is folded. On geese they remain at least partly visible (usually as a narrowing tract running out from the tertials), and on ducks the speculum (which is on the secondaries) is revealed whenever the scapulars and flanks are partly or fully opened.

5 Tails

Tail pattern and shape provide many important identification features. Some of the differences are obvious, but others are subtle and require careful observation: if they are to be correctly assessed, it is necessary to understand the structure of the tail, especially the mechanics of how it opens and closes. It is important to practice on common species, in order to gain familiarity with the points explained below.

TAIL PATTERN

All west Palearctic passerines have 12 tail feathers, except Cetti's Warbler which has ten. The tail opens and closes like a fan, with each feather overlapping the next, outwards from the central pair (Fig. 1). One of the central pair overlaps the other and is thus fully visible apart from the base which is covered by the central uppertail-coverts.

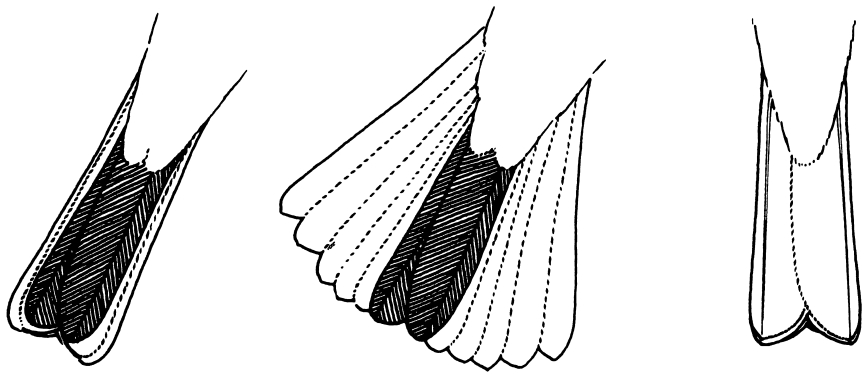


Fig. 1: Tail of Black or Common Redstart demonstrating fan-like mechanism of bird's tail: fully closed from above (left) and from below (right). See text for further explanation.

When the fully closed tail is viewed *from above*, the five outer pairs are almost completely covered by the central pair: only their outer fringes remain visible. Thus a perched Black or Common Redstart shows little or no red on the tail, because the brown central pair largely conceals the extensive

red on the outer five pairs. Field guides invariably illustrate those species which have distinctive tail patterns in unnatural spread-tail poses; it is therefore important to realise that it is impossible to see such things as the tail pattern on wheatears and larks, or the white panels on a Whinchat and Red-breasted Flycatcher, except in flight or if the tail is fanned.

When the fully closed tail is viewed *from below*, the outer pair is fully visible and largely conceals the other feathers: on a redstart, therefore, the tail looks all red. This also means that it is possible to see the pattern of the outer tail feathers, which is sometimes diagnostic on wheatears, *Sylvia* warblers (especially from behind when the tail is cocked), pipits, buntings etc.

Several species have a distinctive colouration or pattern on the inner web of each tail feather, which is revealed only in flight or when the tail is fully spread, such as the white tail spots on a Swallow, Blackpoll Warbler or Goldfinch (Fig. 2). If the colour or pattern extends to the outer feathers, it is also visible on the closed tail when viewed from below.

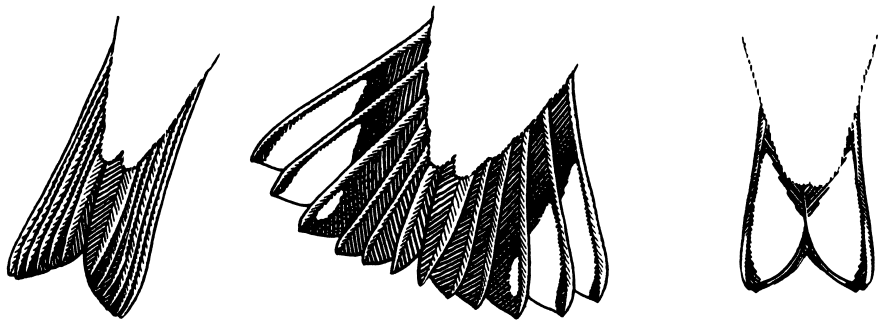


Fig. 2: Tail of Blackpoll Warbler showing that white on inner webs visible only when tail fully spread (centre) or from below (right).

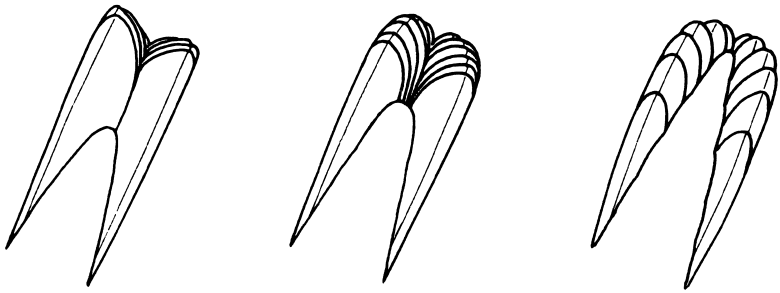
A particular cautionary note is necessary when viewing the underside of a tail against the light, for example on a bird overhead in a tree canopy. Because the outer web of the outer tail feather is only a single thickness and thus translucent (whereas the rest of the tail is opaque, consisting of several overlapping layers), it can appear as a pale outer web even on a species which has a plain tail. In cases where a pale outer web is an important identification feature (such as on Olivaceous or Booted Warbler) it is therefore necessary to assess the tail pattern against a dark background.

TAIL SHAPE

The length or shape of a tail are obvious identification features on groups such as kites, terns or skuas. Even these can be tricky, however, when moult or missing feathers produce atypical shapes. More difficult are the potentially useful tail shape differences of many passerines, especially warblers. Deciding

whether a tail-end is rounded, square or notched, or whether the undertail-coverts are long or short is often very important, but can be more difficult than most identification literature would indicate.

A species with a rounded tail-end can appear to have a square-ended tail when viewed from the side or from above: it can also show a notch in the tail-end, because all passerines can hold the tail with a natural division between the tips of the central pair of feathers (Fig. 3). Conversely, a square-ended tail can look rounded when it is tightly closed.



Phylloscopus *Acrocephalus* *Locustella*

Fig. 3: Underside of tail of typical *Phylloscopus*, showing square end and short undertail-coverts; *Acrocephalus*, showing round end, potentially misleading notch at tip, and long undertail-coverts; and *Locustella*, showing strongly rounded tail and very long undertail-coverts.

The most reliable technique for assessing tail shape is to observe the underside of the tail, either from below or from behind when the tail is cocked (Fig. 3). A rounded tail shows graduated ends of the outer tail feathers, whereas a square tail shows the feather ends bunched near the tip of the tail. Given excellent views, much more subtle differences can be seen, for example the slightly graduated outer tail feathers on an Olivaceous Warbler as opposed to the more square-ended tail of the other *Hippolais*.

Undertail-coverts length is also best assessed in the same way, rather than in side on views when their full length is usually not evident. Do not assess their length by the distance from the tip of the tail, but in comparison with the length of the exposed tail. For example (Fig. 3) on *Phylloscopus* (and *Hippolais*) warblers they reach just over half way towards the tail-tip; on *Acrocephalus* they reach two-thirds of the way; and on *Locustella* they almost reach the tail-tip.

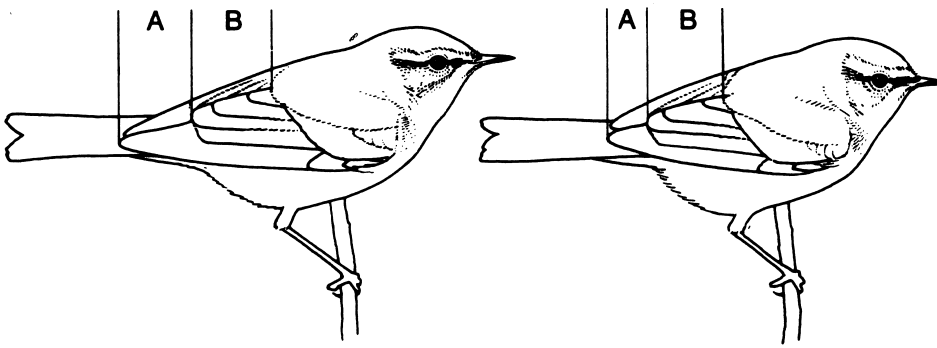
6 Wing structure

Differences in wing structure are important in the identification of many difficult species. A few examples are included below, but so often does wing structure help to narrow down the choice or clinch an identification, that it is always a sound rule to note as much wing structure detail as views will allow, especially for difficult species.

PRIMARY – PROJECTION

Species which migrate farther are usually longer winged than related species which are short distance migrants. For example, Willow Warbler (which winters south of the Sahara) is longer winged than Chiffchaff (which winters mainly in the Mediterranean region): this can be a useful difference on these and other tricky species.

Do not try to estimate wing length by trying to judge how far down the tail the wing-tip reaches, as so much depends on angle of view or the bird's posture. A much more reliable technique is to compare the length of the *primary-projection* (the distance which the primaries project beyond the longest tertial, labelled A) with the length of the exposed tertials (labelled B). These are fixed distances, unaffected by posture or angle of



Outlines of Willow Warbler (left) and Chiffchaff, showing relative lengths of primary-projection (A) and tertials (B)

view. Their relative lengths should be assessed when looking down on the bird from the side or rear, when the junction of the tertials and primaries can be clearly seen.

As illustrated opposite, on Willow Warbler, A and B are about equal, whereas on Chiffchaff, A is about half the length of B. Primary-projection is a valuable clue on many warblers, for example Icterine Warbler (A about equal to B), Melodious Warbler (A about half B), Booted Warbler (A about one third B) etc.

The length of the primary-projection (or its total absence on some species, on which the tertials reach the wing-tip) is useful on groups other than warblers, notably larks, pipits and waders. For some species, too, it can provide a useful identification short-cut, because it is a difference valid for all plumages. For example, Little Crake has a very long primary-projection, whereas it is very short on Baillon's Crake; or American Golden Plover which has a rather long primary-projection (containing four or five primary tips) and Pacific Golden Plover which has a shorter primary-projection containing only three primary tips: in such cases it is not necessary to remember the rather complex age and sex related plumage or bare parts differences in order to make an initial identification.

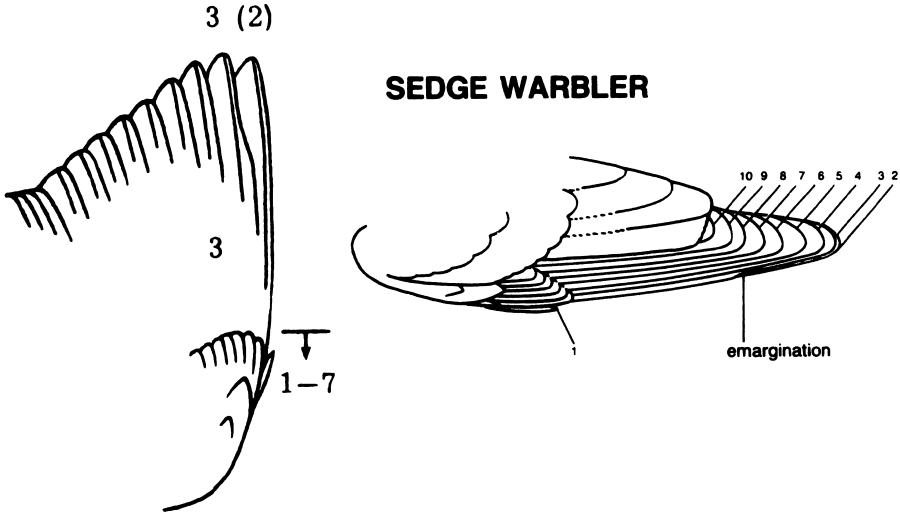
Practice observing the primary-projection on common species, especially those on which it is relevant to others in the group like Willow Warbler, Chiffchaff, Skylark, Meadow Pipit, Little Stint etc. Although it always requires good views to see the primary-projection, it becomes much easier and quicker by practising exactly where to look and what to look for.

WING FORMULA

The distinctive wing formulae of several difficult passerines are shown in diagrams in *Identification Guide to European Passerines* 3rd edition (Svensson 1984). These are primarily intended for in-the-hand identification, but given good views through a tripod-mounted telescope (and often a lot of patience waiting for the bird to stay still long enough!) it is possible to read wing formulae in the field.

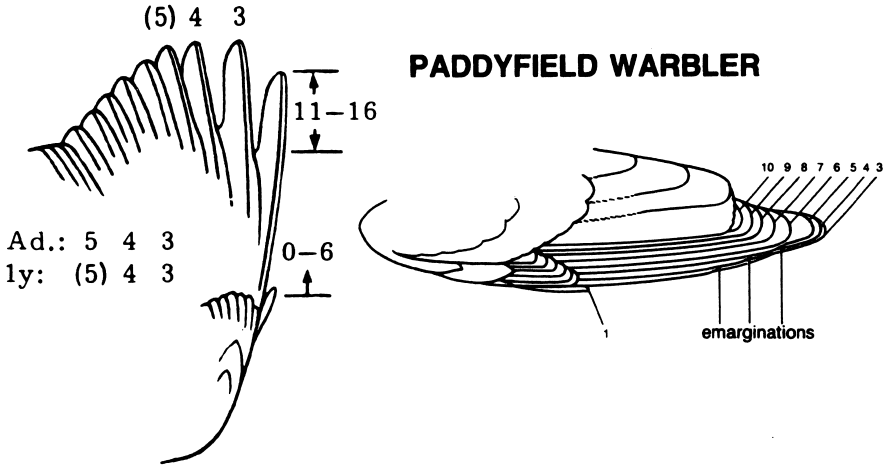
The wing formula diagrams can be interpreted for the closed wing as seen in the field. The number of primary tips that will be present in the primary-projection, and whether the primary tips will be well spaced or bunched near the wing-tip, can be deduced from the information in the diagrams. Examples of this interpretation, for Sedge and Paddyfield Warblers, are shown here.

In addition to the number of primary tips visible in the primary-projection, and their spacing, it is possible (in the most perfect views) to count the number of emarginated primaries. Other potentially useful fine detail may also be discernible, such as the lengths of the shorter outer primaries, which are not visible on the closed wing from above, but which can be seen given views of the underside of the wing-tip, *eg* when the wing is drooped during preening.



Wing formula diagram (from Svensson, 1984) and closed wing of Sedge Warbler. Because either the 3rd or (uncommonly) the 2nd primary can be longest, it can be deduced that the closed wing will show eight or nine primary tips within the primary-projection, and also that if (as illustrated) nine primary tips show, the longest (2nd) will be only marginally longer than the 3rd; also, only the 3rd primary is emarginated, and the 1st is always shorter than the longest primary covert.

Photographs often reveal detail that is impossible to discern in the field, and they can be especially useful for revealing wing formula details. When assessing wing formula, it is useful to know that all passerines have ten primaries (the 1st often very small) and six secondaries (excluding the tertials), but beware of missing feathers.



Wing formula diagram (from Svensson, 1984) and closed wing of Paddyfield Warbler. Because either the 3rd, 4th or (uncommonly) the 5th primary can be longest, it can be deduced that the closed wing will show eight, seven or six primary tips within the primary-projection, and also that if (as illustrated) eight primary tips show, the tips of the longest three will be closely bunched at the wing-tip; also, the 3rd, 4th and 5th primaries are emarginated (the 5th less prominently in juvenile and 1st-winter), and the 1st primary is the same length or longer than the longest primary covert. The position of the notch on the 2nd primary, as shown in the diagram, is useful on this and other species, but cannot be discerned in the field.

7 Judging structure

Shape and structure (of wings, bill, body etc.) are important for identifying many species. The differences are often obvious, and can be correctly assessed by subjective judgment based on previous experience or identification literature. For example, no special technique is required to appreciate the greater length and more even curve of a Curlew's bill compared with a Whimbrel's, or the stockier shape of a flying Great or South Polar Skua compared with other skuas.

For difficult species, the differences are often slight and notoriously prone to incorrect assessment, sometimes leading to misidentification. The problems that produce such mistakes vary according to which type of feature is being assessed, but in all cases subjective judgments have clearly been inadequate. Taking the bill length and bill shape of stints (which are often useful identification pointers) as an example, the problem might be that the observer had insufficient experience of stints to make a valid judgment, or that the bill of the particular stint fell in the overlap range. The overwhelming desire to name the bird can override facts, and an incorrect identification is made on the basis of "differences" which are actually non-existent. There is no easy remedy for these psychological pitfalls, except awareness of them and the ability to recognise the limitations (of personal experience and the eye) in making subtle structural judgments: this is an essential attribute in the New Approach.

Another important consideration in judging structure involves the ability of all birds to alter the shape of their head and body by holding the plumage either sleek or fluffed up. For example (Fig. 1), a Little Stint with sleek plumage (left) looks slimmer-bodied, longer-bodied, longer-necked, longer-legged (because the full length of the tibia is exposed), smaller-headed, and longer-billed (in proportion to the smaller head) than when it has its head hunched into its shoulders and its plumage fluffed up (right). It is important to be aware of the real and illusory effects of this phenomenon when judging structure on all birds. This mechanism for temperature control in birds is a reflex and so they are more likely to look slim in warm temperatures, and fluffed up in cold or windy conditions, but this may not apply to all birds in a flock at any one time: one or two may be fluffed up while the others look slim!

Fig. 1.

The pitfalls of judging slight structural differences can be avoided by relying on objective measurement techniques rather than subjective impressions. Examples of objective techniques have already been described for judging tail shape and undertail – coverts length in Part 5, and wing structure (*eg* primary – projection and wing formula) in Part 6. Objective techniques rely on tangible features (*eg* the arrangement of tail feather and primary tips) and comparisons between plumage features of fixed length (*eg* the primary – projection/exposed tertials comparison).

Objective techniques can similarly be applied to any structural features. For example, bill length can be judged in comparison with the loral distance (the length from the loral point to the eye) or loral distance plus eye diameter: this is safer than comparison with the length of the head, which can vary according to posture and whether or not the head feathers are fluffed up; bill thickness can be judged in comparison with eye diameter; tarsus length can be judged in comparison with bill length, and so on.

Objective techniques can be specially devised to suit particular features, and there is much scope for ingenuity. For example, on Glaucous and Iceland Gulls the difference in bill size and the length of wing projection beyond the tail – tip are usually obvious, but there is considerable variation and identification is often contentious. This can be resolved by careful comparison (Fig. 2) of the eye diameter from the front to the back of the eye excluding the fleshy corners (A) with the bill length from the feathering on the culmen to the tip (B). A bill:eye ratio of more than 4.5 indicates Glaucous, less than 4.2 indicates Iceland. If this fails (there is a small overlap zone from 4.2 to 4.5), compare the bill length from loral point to

tip (C) with the length of the wing projection beyond the tail (D). On Glaucous the wing projection is always about the same or shorter than the bill, whereas on Iceland it is always obviously longer than the bill. (The help of Raymond Henson and Peter de Knijff in establishing and refining these points is acknowledged.)

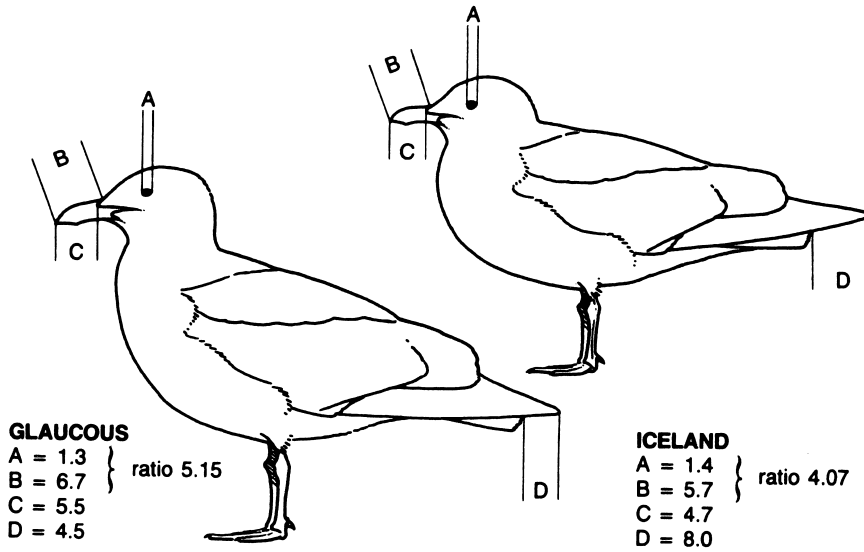


Fig. 2.

The precision in defining such techniques should be noted; for example, it is usually insufficient to say: "compare bill length with eye diameter", as it is essential to know the precise points from which the measurements should be taken.

Intricate objective techniques which involve precise measurements or fine detail can be difficult or impossible to apply in the field. They come into their own, however, in photographs. Sharp, full profile pictures are essential, so that out-of-focus images and foreshortening (*eg* of bill length) do not distort the measurements. The availability of photographs of contentious birds from the growing band of specialist rarity photographers has made this sort of analysis an increasingly useful part of the New Approach.

8 Judging size

Telling the size of a bird is much more tricky than is generally realised. Misjudgment of size is the root cause of many misidentifications.

Accurate assessment of size is possible only in comparison with other birds nearby. Even then, the potentially misleading effects of "size-illusion" (see later) need to be realised.

With a lone bird, useful clues to size are provided by the speed of wingbeats or other actions, but even at close range, with plenty of perspective clues and size comparison with surrounding foliage etc., it is best to regard size assessment as only approximate.

Against a featureless sea or sky, any meaningful size assessment is quite impossible, even if there are other birds around which seem to provide a comparison. This is because it is impossible to judge relative distances, as with a spiral of soaring raptors, or with passing seabirds.

These statements may come as a surprise because most birdwatchers believe that it is possible to judge size accurately in almost any field situation. This belief arises because, right from the start, beginner's literature such as the "How to Identify Birds" section at the beginning of any field guide gives estimating size as the starting point in any identification process. The impression is given that it is an easy and routine part of birdwatching, and the ability to do so is rarely questioned. In fact, accurate assessment of size is beyond the capability of the human eye. We may think we are judging size all the time, but all that is really happening is that we know the size of a bird the instant it is identified. In effect, the process is no more than: "It's a Barred Warbler, so it's Barred Warbler sized".

Most of the time this does not cause identification problems, because the bird has been correctly identified on features other than size: any "size assessment" is actually academic.

Problems arise, however, if a bird is misidentified (it will also automatically look "the right size"), or if size is the major feature by which a bird has been told from a similar species.

The real difficulties of judging size are perhaps most evident on occasions when a bird is encountered which is so unfamiliar that it cannot even be identified as to family: estimates of size can then be wildly inaccurate.

In practice, it is difficult to decide when apparent size can be relied upon, because it all depends on variable factors such as distance and situation. At fairly close range, it may be possible to tell the marked difference in size between a Jackdaw and a Carrion Crow or a buzzard and an eagle (but even then it is debatable how much of this is real size-judgment, and how much might have been interpreted from the initial identification or other characters such as speed of wingbeat etc.). Even in cases where size difference is quite marked, it is risky to base an identification wholly or mainly on apparent size, *eg* for telling a Long-legged from a Steppe Buzzard; a Spotted from a Lesser Spotted Eagle; a Barred from a Garden Warbler; a "small crake" from a Water Rail; or even a Cory's Shearwater from an immature Gannet.

The safest approach is to rely on size only when it has been compared with other birds nearby. In other situations, it is best to ignore apparent size and instead to rely on objective differences such as plumage marks, shape, structure, voice etc.

SIZE ILLUSION

A further problem involves a remarkable illusion which occurs whenever binoculars or telescopes are used. The farther of two objects looks larger than it really is in comparison with the nearer object. This is "size illusion". It can be demonstrated by looking at two same-sized coins through a telescope. Place the coins 15-20 cm apart in a straight line away from the telescope. The farther coin will look considerably larger than the nearer one. The higher the magnification, and the nearer the coins, the more striking is the illusion.

Size-illusion can lead to obvious problems when judging the size of birds. The nearer of two Reed Buntings perched on a fence will look Little Bunting sized; the farther of two Little Stints will look too large for a Little Stint. If they are also in plumages which can be confused, they could easily be misidentified as Little Bunting and Semipalmated Sandpiper respectively, and an observer who is unaware of size-illusion would understandably also believe that he had made a valid size comparison which supported the identification.

Through binoculars and telescopes, therefore, accurate size comparisons can be made only with birds which are exactly the same distance away (and this distance can be safely judged only if they are not too widely separated), or if a bird is among a group of other birds (*eg* a feeding or flying flock of waders) when subconscious adjustments are made which compensate for size-illusion.

The cause of size-illusion can be explained by holding up two same-sized coins, one at arm's length, the other at half that distance. The farther coin will look half the size of the nearer one: this is normal perspective, and the brain will interpret that the coins are the same size. If the coins were 30 arm's lengths away and still the same distance apart, the farther one would then look only slightly smaller than the nearer one (this, again, is normal perspective, in which relative size differences decrease with distance). If they were looked at through a 30x telescope, this size difference would remain the same within the magnified image. The brain, however, perceives the coins as being 30 times nearer (at the original arm's length), at which distance the farther coin should look half the size of the nearer one. But because the farther coin in the magnified image appears only slightly smaller than the nearer one, it is perceived as being nearly twice its true size. Magnification brings images nearer but does not alter their perspective lines.

Size-illusion is also reproduced by telephoto lenses, so care should be taken when making size comparisons of birds in photographs. The farther of two same-sized birds will look larger than the nearer one, although actual measurement will show that its photographic image is actually slightly smaller, as it would have appeared with the naked eye at the distance at which the photograph was taken (or as it would also appear if the photograph is looked at with the naked eye at the distance from which it was originally taken).

9 Moult

Moult is the process in which old feathers are shed and new ones grow in their place. It is necessary for keeping plumage in good condition and, in most species, produces different winter, summer and immature plumages.

Understanding moult is very important in the New Approach. It explains how a species acquires its various plumages, giving an insight which is essential when trying to age and sex birds. In difficult identifications, diagnosing the age of an individual is often the essential starting point, so that comparisons can be made with similar species in the equivalent plumage. Knowledge of moult frequently provides an explanation for atypical plumage features, which might otherwise be confusing or even lead to misidentification (Figs. 1 & 2).

Part 9 is intended as an introduction to moult, suggesting ways to approach the subject and giving some basic ideas and facts.

LITERATURE

Reference literature is essential, and two booklets are recommended: *Moult in Birds* (Ginn & Melville 1983; BTO Guide 19), and *Identification Guide to European Passerines* 3rd edn. (Svensson 1984) both obtainable from the BTO, Beech Grove, Tring, Herts. The relevant parts of their introductions are essential reading, providing basic information about moult. Do not expect to grasp all the facts immediately: several readings, with fieldwork in between, will be necessary before things begin to fall properly into place. If you seriously wish to learn about moult, these pages should become among the most frequently referred to in your ornithological library.

MOULT STRATEGIES

Each species has its own established and reasonably consistent strategy for moult. Depending on the species, there are either one or two moults each year. Each moult is either partial or complete. In migrant species, the

moults take place in either the breeding or wintering area (some species start the moult, suspend it for migration, and continue it on arrival). Other variables from one species to another are the duration of each moult (large species take longer than small ones) and the time of year when each moult takes place. Details of the moult strategy of each species can be obtained from the publications recommended earlier, or from the moult section in each species-account in *BWP*.

EXTENT AND DURATION OF MOULTS

Each moult can be either partial or complete. Depending on the species, a *partial moult* varies in extent from a few head and body feathers, to all the head and body feathers and much of the wings and tail. Depending on the size of the species and the amount of plumage being replaced, it can last from a week or so to several months. Depending on the size of the species, a *complete moult* takes from about six weeks (*eg* most small passerines) to six months or more (*eg* large gulls). Some large birds of prey have complex, extended moults in which the main wing and tail feathers are only partly replaced each year.

Fig. 1 Hen Harrier resembling Pallid Harrier. The Pallid-like small wedge of black is a transitional feature during the male's complete autumn moult in its 2nd calendar-year: the four black-tipped outer primaries are part of the new adult set of primaries which is gradually replacing (outwards from the innermost primary) the original juvenile primaries. On this individual, the new 3rd primary is still growing, and the outer two primaries are old, faded juvenile feathers (now over 12 months old) which have yet to be shed. (*Killian Mullarney*, after Forsman, 1984: *Rovfågelsguiden*)

MOULT TYPES

There are three main types of moult:

1. *Post-juvenile moult*

Depending on the species, the post-juvenile moult starts at any time from immediately after fledging (*eg* most passerines) to several months later (*eg* some large non-passerines). It is a partial moult in most species, complete in a few *eg* (among passerines) larks, Fan-tailed Warbler, Moustached Warbler, Bearded Tit, Long-tailed Tit, starlings, sparrows and Corn Bunting. It produces first-winter plumage.

2. *Spring moult*

Depending on the species, the spring moult starts at any time from early winter to early spring. In most species it is a partial moult. It produces summer plumage.

3. *Autumn moult*

Depending on the species (and in some cases also the age and sex of the individual), the autumn moult starts at any time from late spring to early winter. In nearly all species it is a complete moult. It produces winter plumage.

Some large non-passerines (*eg* large birds of prey) have lengthy, overlapping moults which do not fit into these moult types. Most ducks (which, like swans and geese, shed their remiges simultaneously and become flightless until they regrow) have a special double moult in autumn which produces the temporary "eclipse" plumage, in which males resemble females. The moult is a special adaption of the autumn and spring moults, one immediately following the other; thus eclipse plumage is equivalent to a briefly held winter plumage.

MISCELLANEOUS

Old feathers wear and fade, as is particularly evident on those which are moulted only once each year, *eg* the wing and tail feathers of gulls, on which fading can change dark areas to pale brown and brown areas to white, while white feather fringes, tips and mirrors (which are less durable than dark plumage) can totally wear away.

Species which have only one moult each year (the complete autumn moult) acquire summer colouration by losing pale feather fringes. The feathers are structured so that, as spring approaches, the pale fringes become brittle and fall away during preening, revealing underlying colours. For example, the red on a male Linnet, the black on a male Reed Bunting's head, or the unspotted, glossy head and underparts of a starling are acquired in this way. Some species which also have a partial spring moult acquire full summer colouration in the same way (*eg* stints and some other waders).

Birds grow only a few feathers at a time within each feather tract, so that insulation and the ability to fly are maintained. Within the major feather tracts on the wings and tail, most feathers are moulted in a regular

sequence. For example, most birds (including all passerines except Spotted Flycatcher) moult the primaries in a strict progression outwards from the innermost.

The key to working out the state of moult of a particular bird lies in being able to recognise different generations of feathers. Different generations usually show different colour, pattern, shape, length, or degree of wear, and it is useful to practice recognising these differences in photographs. Two recently-published books are useful sources of photographs for this purpose, because their authors have taken special care in correctly captioning the ages: *Photographic Guide to the Birds of Britain & Europe* (Delin & Svensson 1988; Hamlyn) and *North Atlantic Shorebirds* (Chandler 1989; Macmillan).

Differences in the moult strategies of similar species provide many helpful identification features. For example, the partial spring moult of Common Tern includes (unlike Arctic Tern) the inner primaries, and this produces the dark wedge on the upperwing which Arctic lacks; and (because juvenile waders do not include flight feathers in the post-juvenile moult, and because adult Whimbrel does not start the complete autumn moult until after migration) any curlew moulting primaries in Europe in autumn is an adult Curlew.

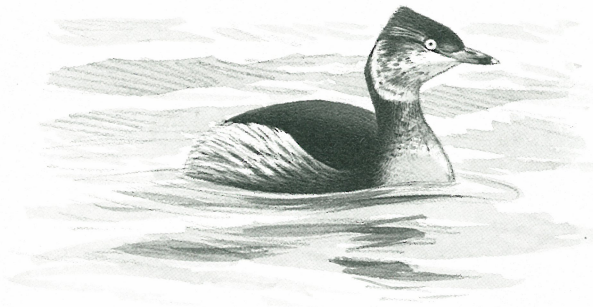


Fig. 2 Slavonian Grebe resembling Black-necked Grebe. This individual is moulting from winter to summer plumage, and dark summer feathering appearing on the rear ear-coverts and foreneck give a pattern which, especially at a distance, could be mistaken for that of winter Black-necked Grebe.

FIELDWORK

Gulls are especially recommended as a target for field studies of moult. They are common, large and approachable, which means that their plumage can be closely studied. All common European gulls have a partial post-juvenile moult, followed in each subsequent year by a partial spring moult (producing *eg* the hooded summer plumage of some species) and a complete autumn moult (producing winter plumage). In the course of the latter, gaps in the wing and tail feathers enable the progress of the moult to be followed. With a knowledge of moult, it becomes much easier to understand and recognise the otherwise confusing range of immature plumages of gulls. Wear and fading is especially evident on first-summer gulls, providing a useful insight into this aspect of plumage. *Gulls: a guide to identification* 2nd edn. (Grant 1986; T. & A.D. Poyser) is an essential reference, especially the Introduction and General Information sections.

Waders, which have a similar moult strategy to gulls, are another especially instructive group, for which knowledge of moult is essential for ageing or when identifying difficult species. For these, the essential reference is *Shorebirds* (Hayman, Marchant & Prater 1988; Helm), especially the sections on moult and plumages in the introductory chapters.

Study moult in these groups, and in other species whenever the opportunity arises.

10
Terminology for plumages and age

Precise observation of topography and structure – backed up by precise terminology – is the essence of the New Approach. The following definitions are to encourage the equally important use of correct standard terminology for describing the various plumages or ages of birds. If this succeeds only in correcting the wide misuse of the terms "juvenile" and "immature", it will have served a good purpose, but it is hoped that it will do more than that. Learning, understanding, and correctly using the full terminology for plumages and age is the starting point for recognising the various plumages in the field and understanding the moults which bring them about.

The terminology defined here follows that recently standardised, and which has been adopted in most of the more recent identification literature. It is hoped that it will be even more widely used in future, because standardisation of terminology for plumages and age is much needed. Few of the older publications agree on terminology, so interpretation of their various terminologies is required when consulting them. Even less helpful to anyone trying to get to grips with the subject, are the frequent incorrect captions as to plumage and age (and sloppy, imprecise terminology) on illustrations and photographs in identification articles, identification books and field guides. Some publications are worse than others in this respect, and some (compiled by authors who know their subject and care about accuracy and precision in identification) are relatively fault-free. Bear this in mind, and try to make your own diagnosis rather than always trusting captions. This, in any case, provides excellent practice.

PLUMAGE TERMINOLOGY

Juvenile
The plumage in which a bird first flies. In most species it is different from subsequent plumages and easily recognised, *eg* the spotty plumage of juvenile Blackbird, the plain brown-grey plumage of juvenile Starling, or the extensively ginger-brown plumage of juvenile Black-headed Gull. It lasts until the post-juvenile moult, the timing of which varies depending on the species. Juvenile plumage can therefore last for a rather brief period after leaving the nest (*eg* many passerines), or until arrival in winter quarters (*eg* most waders), or into the 2nd calendar-year (*eg* divers).

First-winter
The plumage produced by the post-juvenile moult. In some species, especially those with a complete post-juvenile moult, this plumage is indistinguishable from adult winter. Most species, however, have only a partial post-juvenile moult, so first-winter plumage is recognisable usually by distinctively patterned, retained juvenile wing and tail feathers. First-winter plumage lasts until the spring moult to first-summer plumage; some species acquire first-summer plumage by loss of pale feather fringes as described for adult summer.

First-summer
"First" here refers to the first full summer, not to the summer in which the bird hatched: confusion will arise if this point is not firmly remembered. In some species, this plumage is indistinguishable from adult summer. In others, it can be told by continued retention of distinctive juvenile wing and tail feathers, or partial acquisition (or lack) of summer colouration. First-summer plumage lasts until the autumn moult to second-winter plumage.

Some species have further recognisable immature plumages - second-winter, second-summer *and so on. For example, large gulls do not acquire adult colouration until* fourth-winter *plumage. Once adult, a bird's plumage does not change further with age, but most species have two distinct seasonal plumages...*

Adult winter
Produced by the autumn moult and retained until the spring moult.

Adult summer
Produced by the spring moult and retained until the autumn moult. Note that species which have only one moult each year (a complete autumn moult) acquire summer colouration by the loss of pale feather tips or fringes in spring, which reveals the differently coloured remainder of the feathers, *eg* finches and starlings.

Transitional plumages
When a bird is moulting from one plumage to the next, it can be referred to as "juvenile moulting to first-winter", "first-summer starting moult to second-winter", " second-summer near end of moult to third-winter" etc, as appropriate.

GENERAL TERMS

The following terms are useful if groups of plumages need to be referred to, or if it is impossible to determine the precise age or plumage of an individual.

Immature
A general term covering all plumages other than adult. Depending on the species, immatures can be recognised from a period of a few weeks to several years.

First-year
A general term referring jointly to the plumages of approximately the first year of life (juvenile, first-winter and first-summer plumages).

Second-year
A general term for the plumages of the second year of life (second-winter and second-summer plumages). Similarly, *third-year* and so on.

CALENDAR-YEAR TERMINOLOGY

This is especially used for species (*eg* large birds of prey) which have lengthy, overlapping periods of moult with no periods of static plumage, and for which the usual plumage terminology is inappropriate. It is also useful if age-groups need to be referred to generally, or if precise plumage definition is impossible. Further precision can be added by including the date, month or season, *eg* "2nd calendar-year (November)", "3rd calendar-year (autumn)" etc.

1st calendar-year
An individual up to 31st December of its hatching year.

2nd calendar-year
An individual between 1st January and 31st December of the year after it was hatched. Similarly, *3rd calendar-year* and so on.

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