

SEABIRDS

an identification guide

by **Peter Harrison**

illustrated by the author



CROOM HELM LTD
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ACKNOWLEDGEMENTS

My interest in seabirds began some 20 years ago during a fierce northwest gale. Ten birders, myself the youngest, were crouched in the lee of the coastguard lookout at St Ives Island. Below us the Atlantic roared inwards, dashing itself against the Cornish coast. The bay was a maelstrom of foaming white caps and black watery hollows; above the troughs, with contemptuous mastery the Gannets rode out the storm, rising and falling in long white lines, thousands upon thousands escaping the storm like retreating troops. Hardly a minute passed without the shout of 'bonxie', 'skua', or 'petrel'. Until then most of my birding had been with terrestrial species, but that gale converted me to seabirds. I have been hooked on them ever since.

During my teens, Laurie Williams, a local Cornish birder, spent many hours coaxing and encouraging my interest in seabirds. From him and the other St Ives watchers came the inspiration to write this guide. In 1973 my wife Carol and I set out on a seven-year research-gathering expedition. Our travels took us from the Arctic to the Antarctic through the continents of Europe, Africa, Australia and the Americas. During those years we received generous support and help from local birders the world over. To all those people, too numerous to mention here, I record my thanks. Drafts of species accounts were sent to leading seabird experts in several countries. Without exception the following people offered constructive advice and helpful suggestions for improvements; to them go my grateful thanks: Richard Brooke (taxonomy), Dr Peter Fullagar (*Sphenisciformes*, *Procellariiformes*, *Pelecaniformes*, *Stercorariidae* and southern *Laridae*), Peter Grant (gulls and terns), Dr JR Jehl, Jnr (Pacific seabirds), Ron Naveen (storm-petrels and North American seabirds), Dr Bryan Nelson (frigatebirds), Ian Sinclair (Southern Oceans seabirds), Richard Stallcup (North American west coast seabirds), Peter Stewart (Mediterranean seabirds), Dr Jerry van Tets (*Sphenisciformes*, *Procellariiformes*, *Pelecaniformes*, *Stercorariidae* and southern *Laridae*), Dr John Warham (*Sphenisciformes* and *Procellariiformes*). Especial thanks go also to Mr Galbraith at the birdroom, British Museum (Natural History), and to Mrs Vale, the chief librarian. Grateful thanks also go to David Christie, copy-editor, who provided much helpful advice and suggestions for improvements to the text. My thanks also go to Croom Helm Ltd for their part in producing this guide, especially to Christopher Helm, Mike Conway and to Jo Hemmings, Natural History Editor, and her American counterpart Harry Foster at Houghton Mifflin. My thanks also go to the Consultant Editors concerned—Mark Beaman at Croom Helm and Peter Alden at Houghton Mifflin.

There are two people who deserve especial mention and without whose help this guide could not have been written in its present form. Victor Tucker, a lifelong friend, has given much of his spare time over several years in the gathering of information and proofreading. His suggestions and acute criticisms, on both text and artwork, delivered with much dry humour, were invaluable. For all those long evenings and weekends when I kept him at home, making copious suggestions for improvements to the text instead of out birding, I offer my sincere and grateful thanks.

Finally my greatest thanks go to my wife, Carol, without whose help and encouragement this guide would not have been completed. Acting as a wife, mother and secretary, she endured hardships that would have routed the best of men. Her courage and resolve during adventure and crisis were a constant example. In the later stages of this project she typed and re-typed drafts and revisions with a cheerful silence. Only the people that know her will appreciate how much she has contributed to this guide and, without her, how little I would have achieved.

FOREWORD

The sea is now the great frontier for those birders who have mastered the identification of land-based birds. Although regional field guides usually include brief accounts of offshore and pelagic birds, there has always been a need for a more extensive guide such as this which caters for those travellers and far-ranging binocular addicts who spend time at the shiprail. The pioneer work, WB Alexander's *Birds of the Ocean*, first published in 1928, filled the niche for many years. It was rather rudimentary by today's standards but the patternistic treatment of the illustrations was valid, a forerunner of field guides to come.

In 1953, about 25 years after the initial publication of Alexander, James Fisher and I laid plans to write and illustrate our own field guide to the world's seabirds. Fisher with his usual sensitivity felt that we should not publish our effort while his friend Alexander, many years his senior, was still living. At that time, Fisher, who had just completed his monograph on the Fulmar, had an encyclopedic knowledge of seabirds equalled by few ornithologists, among whom would have to be mentioned Dr Robert Cushman Murphy of the American Museum of Natural History and Dr William Bourne of England. Dr Bourne expressed doubts that we could handle the various dark petrels critically, and I suspect he may have been right. After many years of travel, in every ocean of the world, mainly on the *Lindblad Explorer*, I am still puzzled by some of the 'odd jobs' that I see scaling over the waves.

In 1970 James Fisher died in a motor accident while driving home from London. He had not gone very far with his dream of a comprehensive seabird guide, having allowed too many other projects to gain priority. I had no intention of going it alone without the benefit of Fisher's scholarship, even though I then had field experience with a majority of the world's seabirds. To meet the growing need, other authors soon published guides: Watson and Hines (Antarctic); Tuck and Heinzel (World); Harper and Kinsky (Albatrosses and Petrels); etc.

Because of the burgeoning interest in pelagic birds, offshore trips are now scheduled regularly, departing from at least eight or ten ports on the Atlantic and Pacific coasts of North America. At Monterey, in California, boatloads of birders are organised almost every weekend. Similarly, from the Florida Keys to the Gulf of Maine, and from Baja California and San Diego to the offshore waters of Oregon and Washington, the seabirds are receiving a scrutiny that they had not known previously. Pelagic species that were formerly regarded as casual or accidental are now spotted with some regularity. The situation is much the same in the North Sea and around the coasts of the British Isles.

Birds flying over the sea won't stay still while you train your glass on them and, of course, using a telescope on boatdeck or shipdeck is out of the question without a gyroscopic stabiliser. Although a few species of pelagic birds are ship followers, the majority are not; they pass abeam or across the bow, often at a distance, and must be imprinted on the mind quickly before they disappear over the featureless sea.

The publication of this new and very complete guide to the world's seabirds is a red-letter event for the field glass fraternity. The book should accompany every transoceanic traveller and every intrepid birder who ventures offshore in small fishing boats. Through its use we should all become more sophisticated in our ability to recognise challenging seabirds, not only by their field marks and their 'jizz', to use the British term, but also by their flight and other behaviour. The illustrations usually show several plumages or several views of a species, often giving us visual information hitherto unavailable in other reference works.

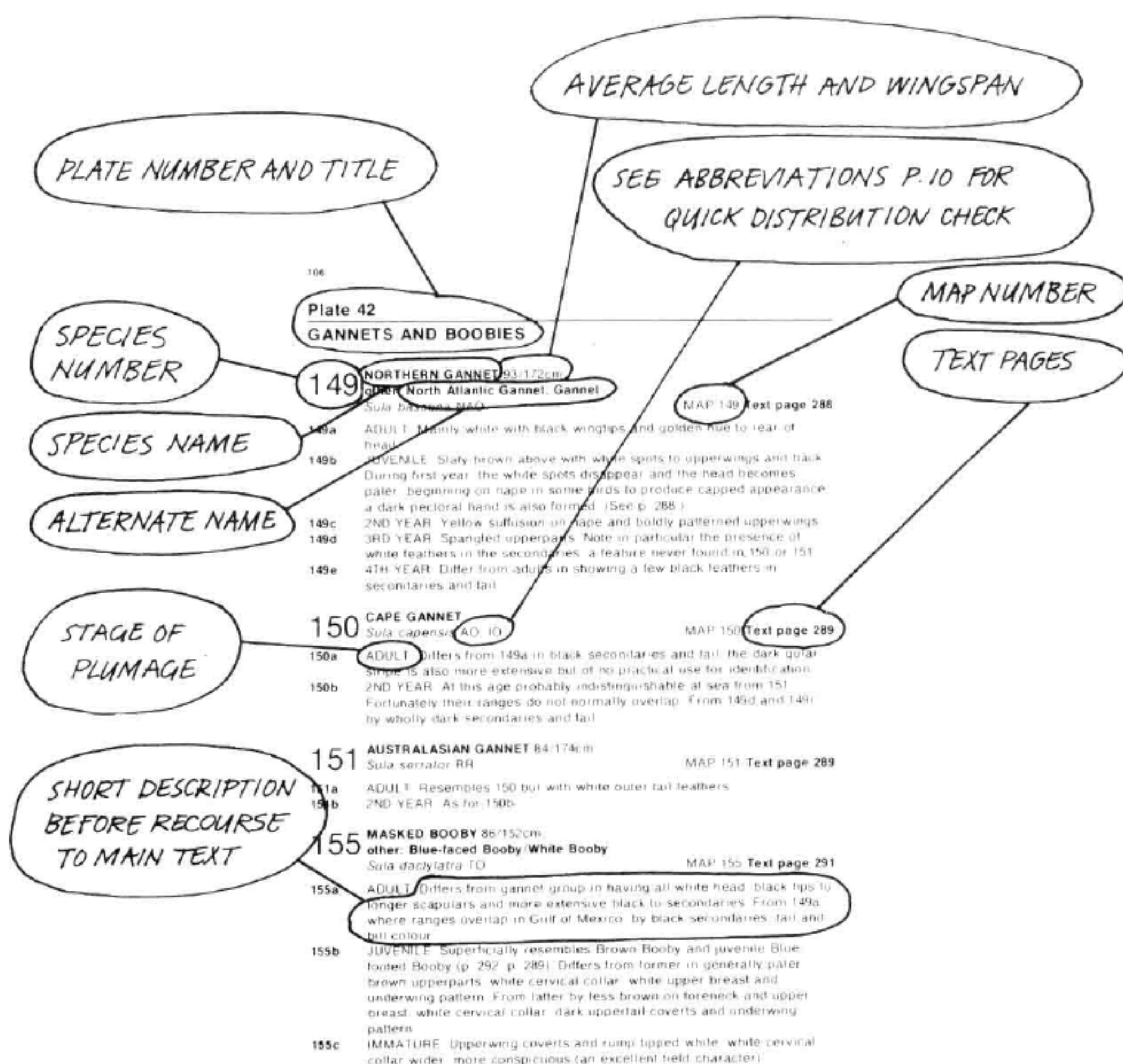
Peter Harrison, who laboured for eleven years on this guide, has doubled as author and artist, a fortunate combination because everyone

sees things a bit differently. It is frustrating for an author to try to convey to an illustrator exactly the way he sees the bird in his mind's eye. To bridge this gulf Peter Harrison set out to learn the craft of bird illustration, and by so doing he has given his seabirds the stamp of authenticity. Whereas a photograph is a record of a split second in the life of a bird, subject to all the vagaries of light, angle and chance, a drawing can be more informative because it is a composite of the artist's field knowledge of the bird.

For the first time some difficult groups have been made to seem less difficult; for example, the notoriously difficult-to-identify prions. These small grey-backed petrels often go unidentified as they dart and dash over the waves of the Southern Oceans. The seafaring birder tentatively identifies the various prion species mainly by the part of the ocean in which he finds them. But in their wanderings all the forms might mingle, as Peter Harrison found during his years as a fisherman and deckhand on trawlers. He has sorted them out visually for us.

It is doubtful whether any other ornithologist or birder can match the number of seabirds that Harrison has actually seen in life. Of the approximately 312 species, he has had field experience with all but 30. We salute him for his industry and artistry in producing this book which will give us much instruction and pleasure.

Roger Tory Peterson



HOW TO USE THIS GUIDE

The recent trend in field guides to adopt a text facing art plate format, whilst aesthetically pleasing, imposes far too many restrictions on the treatment of the more difficult species. The format adopted in this guide is thus divided into six basic sections so that the more problematic species can be treated in depth.

SECTION 1

INTRODUCTION

Deals mainly with seabird identification characters and some of the problems likely to be encountered whilst observing birds at sea. Fig. 1 shows the topography of a gannet. These terms are used throughout the text and, if not already known, should be memorised. They will help you to recognise and describe unfamiliar birds more accurately and quickly.

SECTION 2

ART PLATES AND FACING CAPTIONS

The 88 art plates reproduced in full colour have been painted over a period of four years. They have been drawn almost exclusively from field notes and my personal collection of several thousand photographs taken throughout an eleven-year study period. Shrewd observers will see these plates as no more than an interpretation of known facts upon which to build further knowledge by careful field observation. They are as accurate as my artistic ability allowed at the time of completion. The main figures on each art plate are drawn to the same scale; smaller thumbnail sketches are used to enforce other characters or features raised in the text. The diverse sizes between such groups as albatrosses and storm-petrels have prevented the use of a standardised scale on each of the art plates, but this deficiency has been redressed on the facing caption pages by following the preferred common name of each species with its average length and wingspan in centimetres. Where possible birds which look alike and share similar ranges have been grouped together to save needless time thumbing through pages of illustrations. This has dictated that the species numbers, which have been arranged systematically, often appear out of numerical order on the facing caption pages. The facing captions text should not be used as the main source of reference. It contains but a few brief points taken from the main text to facilitate identification. The facing caption layout is as on the left.

SECTION 3

SYSTEMATIC LIST AND MAIN TEXT

Seabird taxonomy is continually being evaluated. The nomenclature adopted for *Sphenisciformes* and *Procellariiformes* is based on the recent 2nd edition of Peters's *Birds of the World* (Mayr, E. & Cottrell, GW, 1979), although I have not followed the new sequence of orders and families. The nomenclature for

Charadriiformes is based on Howard & Moore's *A Complete Checklist of the Birds of the World* (1980). In a number of cases I have 'split' or 'lumped' species following more recent revisions by various authorities. In this respect I record my grateful thanks to Richard Brooke who steered me through unknown waters with suggestions on taxonomic treatment. In many cases complete texts are included for distinct, isolated subspecies. Where it seems likely that distinct forms will be split into two or more full species, I have given each 'form' the same species number but with a different suffix to allow for easy reference or possible future changes in status. Wherever possible throughout the text I have disclosed my reference sources so that the reader can be directed to more thorough or complementary articles on identification or taxonomy.

The main text covers 312 species and all subspecies which can be distinguished at sea are described. Each species has an individual account summarised as follows.

1 Species Number and Name

Alternative names of importance; plate and map numbers, dimensions and bare parts colours of adults during breeding season. Where marked geographical variation occurs bare parts colours of the nominate race only are given.

2 Introductory paragraph which highlights the information found in the main text, beginning with the species' range, brief notes on similar species found within that range and differences to look for. Sexual and seasonal differences are discussed with notes on juveniles, subspecies and, if appropriate, albinism, melanism, genetic variation and incidence of hybrids.

3 Plumage Description

Beginning with juvenile stage at fledging, or, in the case of certain alcid, departure from their ledges; and all other subsequent plumages where known. The term 'adult breeding' is used in this section simply to describe the plumage acquired during the nuptial period and does not infer that the bird is actively engaged in a reproductive cycle. Space considerations have dictated that the style adopted for these descriptions is sequential and telegraphic. On the other hand, the space gained from tight editing and small print has been used for vignettes and identification keys to amplify points mentioned in text or on the art plates. Note: The term 'no specimens examined/available' indicates that

no museum specimens or field notes were available to the author for that particular stage of plumage.

4 Flight, Habits and Jizz

These are discussed under the heading **FHJ**. This section mentions only those points pertaining to field identification and, where necessary, plumage points are discussed to force home points raised in section 3.

5 Distribution and Movements

These are discussed under the heading **DM**. Generally the order in which a species' breeding range is described begins from the Bering Sea area and proceeds from north to south and then in an easterly direction. Principal breeding areas/islands can be located on the end-papers. Egg-dates and fledging dates are given, plus, where appropriate, the times of exodus from colonies, range of post-breeding pelagic dispersal and dates of return to colonies. Treated on a world scale, this section is not always as full as one would wish but it far exceeds the information found in any of the standard field guides.

6 Similar Species

These are discussed under the heading **SS**. All species which have similar plumage and are likely to occur within the same area as the species under discussion are listed and the key identification points for their separation discussed.

SECTION 4

DISTRIBUTION MAPS

The maps are arranged ten per page. All map numbers coincide with each species' number to enable speedy cross-referencing between art plates, text and maps. The distribution of all species and distinct subspecies is shown in 2-colour maps to indicate breeding, non-breeding and migratory distribution. The dispersal of the more pelagic species remains largely unknown and, as such, these maps should be regarded only as a basic summary of our incomplete knowledge. An asterisk on the map denotes some, but not all, of the occurrences outside the species' normal range. A question mark indicates that a species' range may extend to that area. Refer to p. 442 for map key.

SECTION 5

SELECTED BIBLIOGRAPHY

This section is fully cross-referenced to the main text. It has been included to allow progressive birders to expand their research peripheries on special topics beyond the scope of this book.

SECTION 6

INDEX

Fully cross-referenced to preferred English names and commonly used synonyms and scientific names.

ABBREVIATIONS

On the facing captions text immediately following the scientific name and preceding the map reference number, abbreviations are used to convey a quick distribution reference. This key has been used only for the more pelagic species so that readers can check, at a glance, in which ocean the species under scrutiny normally occurs. Some species may be restricted to one ocean but have been recorded elsewhere and may be suspected of being circumpolar in Southern Oceans (e.g. Buller's Albatross). In such cases only the ocean in which the species is known to occur regularly is listed under the quick distributional reference; a fuller treatment of its range will be found in the main text under **DM** and by referring to the species map. To avoid possible confusion the abbreviations have been kept to a minimum and are as follows:

- WR** = Wide-ranging (likely to be met with in Pacific, Atlantic and Indian Oceans).
- PO** = Pacific Ocean.
- AO** = Atlantic Ocean.
- IO** = Indian Ocean.

- AR** = Arctic Ocean and region.
- AN** = Antarctic region.
- SO** = Southern Oceans (higher latitudes of Pacific, Atlantic and Indian Oceans forming circumpolar water mass between Antarctic Continent and the major land masses of South America, Africa and Australia).
- RR** = Restricted range.

The prefixes **N**, **S** and **T** are used to denote North, South and Tropical respectively. Thus **NPO** and **TPO** read: North Pacific Ocean and Tropical Pacific Ocean. Throughout the main text north, south, east and west have been abbreviated to **N**, **S**, **E** and **W** respectively. Thus 'occasionally wanders S to N Pacific Ocean' reads: 'occasionally wanders south to North Pacific Ocean'. Within the main text months are abbreviated to three letters. Thus **Apr** reads April. Islands are noted simply with '**I**.' whilst groups of islands are denoted '**Is**'. As previously mentioned, **FHJ** indicates flight, habits and jizz, **DM** distribution and movements, and **SS** similar species.

GLOSSARY

JUVENILE

Used here to refer to the plumage at point of fledging or, as in the case of some alcid, departure from ledges.

JUVENILE (FIRST-STAGE) (SECOND STAGE) (ETC.)

In larger birds, especially frigatebirds, several years elapse before full maturity is attained. For convenience, headings such as 'Juvenile (first stage)' are used to catalogue the small changes in the basic juvenile plumage during the first months or perhaps years at sea. The terms are not meant to imply known ages, rather stages in a slow and perhaps arbitrary sequence of plumage patterns in which subsequent stages are described under immature and sub-adult headings.

FIRST-WINTER

Refers mainly to gull plumages in northern hemisphere. Juveniles undergo a moult of head and body feathers starting about August. This plumage is retained until March, when first-summer plumage is attained.

FIRST-SUMMER

Refers mainly to gull plumages in northern hemisphere. First-winter birds acquire first-summer plumage by undergoing head and body moult during March and April. This plumage is retained until about September, when second-winter plumage is attained.

SECOND-WINTER

Refers mainly to gull plumages in northern hemisphere. First-summer birds undergo a complete moult beginning about September. This plumage is retained until about March, when second-summer plumage is acquired.

SECOND-SUMMER

Refers mainly to gull plumages in northern hemisphere. Second-winter birds undergo head and body moult beginning about March. This plumage is retained until about September, when third-winter plumage is attained.

THIRD-WINTER

Refers mainly to gull plumages in northern hemisphere. Second-summer birds undergo a complete moult beginning about September. This plumage is retained until about March, when third-summer plumage is attained.

THIRD-SUMMER

Refers mainly to gull plumages in northern hemisphere. Third-winter birds undergo head and body moult beginning about March. This plumage is retained until about September, when a complete moult occurs to produce fourth-winter or adult non-breeding plumage. In smaller gulls adult non-breeding plumage is usually acquired after second-summer plumage.

IMMATURE

An arbitrary term used to describe any plumage between juvenile and sub-adult stages.

SUB-ADULT

A plumage stage resembling adult but bearing some signs of immaturity.

ADULT NON-BREEDING

Term used to describe the plumage of adults during winter or non-breeding period for those species whose plumage varies seasonally. Normally acquired by post-nuptial moult each autumn.

ADULT BREEDING

Term used to describe plumage worn by a bird during reproductive or nuptial period but not necessarily the plumage of a bird actively engaged in reproduction.

ABERRANT

Diverging from the normal, e.g. in plumage colour or pattern, usually due to a genetic malfunction.

ALBINISM

A total or partial absence of pigment in feathers and bare parts normally coloured, i.e. white.

ALLOPATRIC

A term used to designate closely allied species or families of birds living in different geographical areas.

CULMEN

Term used for the top ridge or plate of a bird's bill. See Fig. 4, p. 221.

CULMINICORN

One of the horny plates making up the bill. See p. 221 for Fig.

GONYS

The prominent ridge/angle formed by the fusion of two halves of the lower mandible towards the tip; especially noticeable in gulls and marked in some larger species by a red spot.

HYBRID

The result of interbreeding by two different species. Most show characters intermediate between the parental species.

INNER WING

That portion of the wing extending from innermost primary to the body, i.e. proximal portion.

LATERICORN

A horny plate running along the cutting edge of the upper mandible. See p. 221 for Fig.

LEUCISM

Allied to albinism. A dilution of the normal plumage pigmentation.

MELANISM

The opposite of albinism. An excess of dark pigment in the plumage or bare parts.

MORPH

Coined by JS Huxley to denote any one of the colour forms, i.e. dark morph, intermediate morph, pale morph, of a species' population subject to polymorphism.

OUTER WING

That portion of the wing including all the primaries, their coverts and alula, i.e. distal portion.

PLATES

Parts of the bill, several horny plates, viz. culminicorn, latericorn, separated by distinct grooves.

POLYMORPHISM

Showing greater differences than the usual level of individual variation within a population.

POST-OCULAR

Area on sides of face behind the eye; the upper ear-coverts.

RAMICORN

A horny plate running along the cutting edge of the lower mandible. See p. 221 for Fig.

SADDLE

Term used to describe the area on upperparts formed by combination of mantle, scapulars and back. Used mainly in gull and tern descriptions.

SEXUAL DIMORPHISM

A difference in size or plumage between males and females of the same species.

SPECIES

The basic category into which living things are divided. An interbreeding group (of birds) that does not interbreed with other groups, or, if some individuals do, they do not do so significantly enough to break down their specific identity.

SUBSPECIES

A race or population distinguishable from the

members of other populations within the species to which they belong.

SUPERSPECIES

A term for two or more species or kinds (of birds) separated geographically and so similar in form and habits that without a geographical barrier they would probably interbreed and produce fertile young, viz. the allopatric gannets (p. 288).

SULCUS

Lateral groove on lower mandible filled with coloured membrane.

SYMPATRIC

Term used for related species which breed within the same geographical area.

TOMIUM

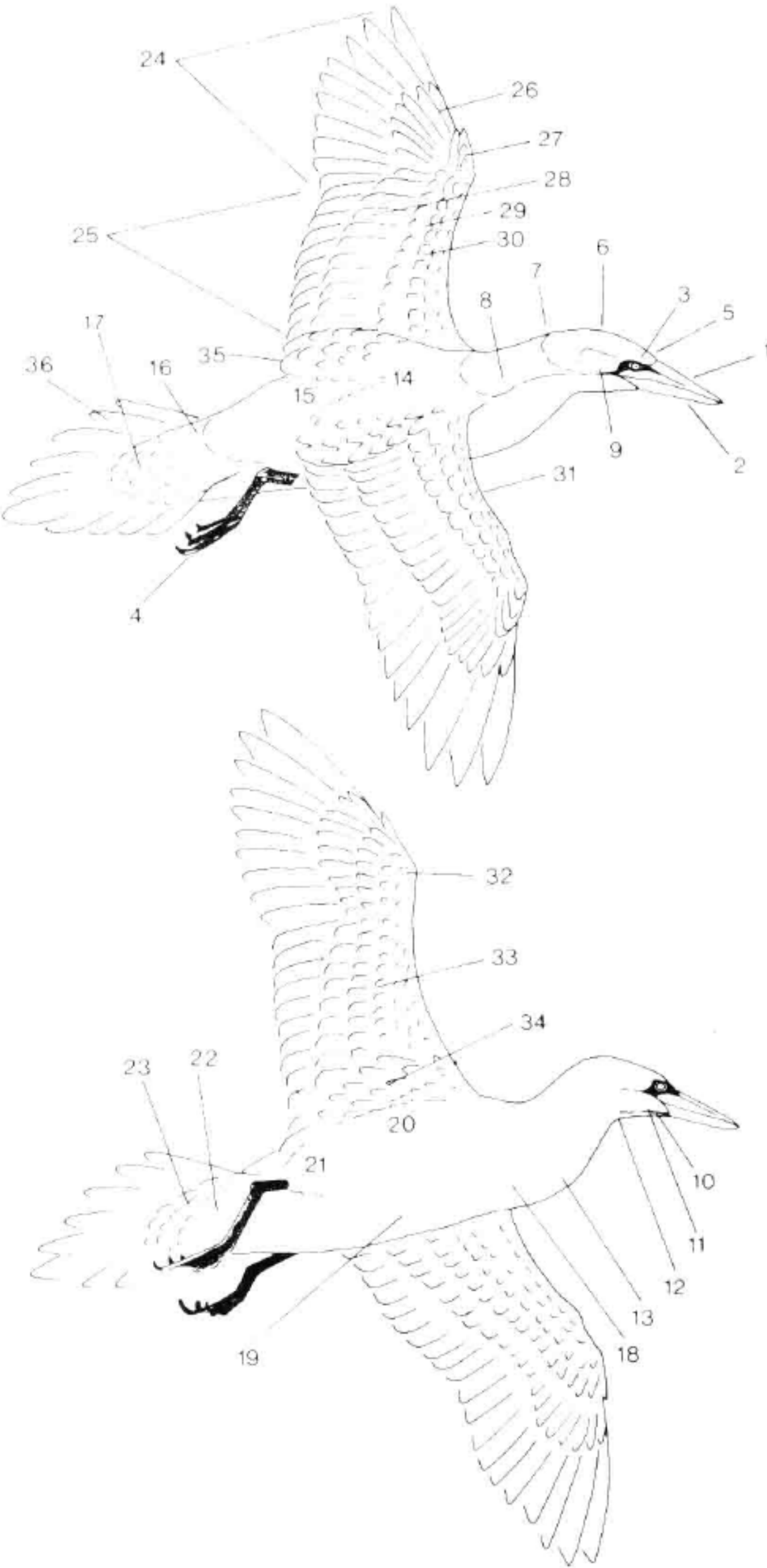
The cutting edge of the bill.

UPPERPARTS

Collective term used to describe mantle, scapulars, back, rump and uppertail-coverts.

Fig. 1. Topography of a Seabird

- 1 Upper mandible
- 2 Lower mandible
- 3 Iris
- 4 Legs/feet
- 5 Forehead
- 6 Crown
- 7 Nape
- 8 Hindneck
- 9 Ear-coverts/cheek
- 10 Chin
- 11 Gular stripe
- 12 Throat
- 13 Foreneck
- 14 Mantle
- 15 Back
- 16 Rump
- 17 Uppertail-coverts
- 18 Breast
- 19 Belly
- 20 Flank/side
- 21 Thigh
- 22 Ventral area
- 23 Undertail-coverts
- 24 Primaries
- 25 Secondaries
- 26 Primary-coverts
- 27 Alula
- 28 Greater coverts
- 29 Median coverts
- 30 Lesser coverts
- 31 Marginal coverts
- 32 Carpal joint
- 33 Underwing-coverts
- 34 Axillaries
- 35 Scapulars
- 36 Tail



INTRODUCTION

This book is intended to help scientists, mariners and amateur birders identify seabirds. The text and illustrations concentrate on plumage sequences and distribution, rather than on their biology, or pertinent oceanography. This has enabled the production of a guide at a cost which should be within the reach of both amateur and professional ornithologists alike.

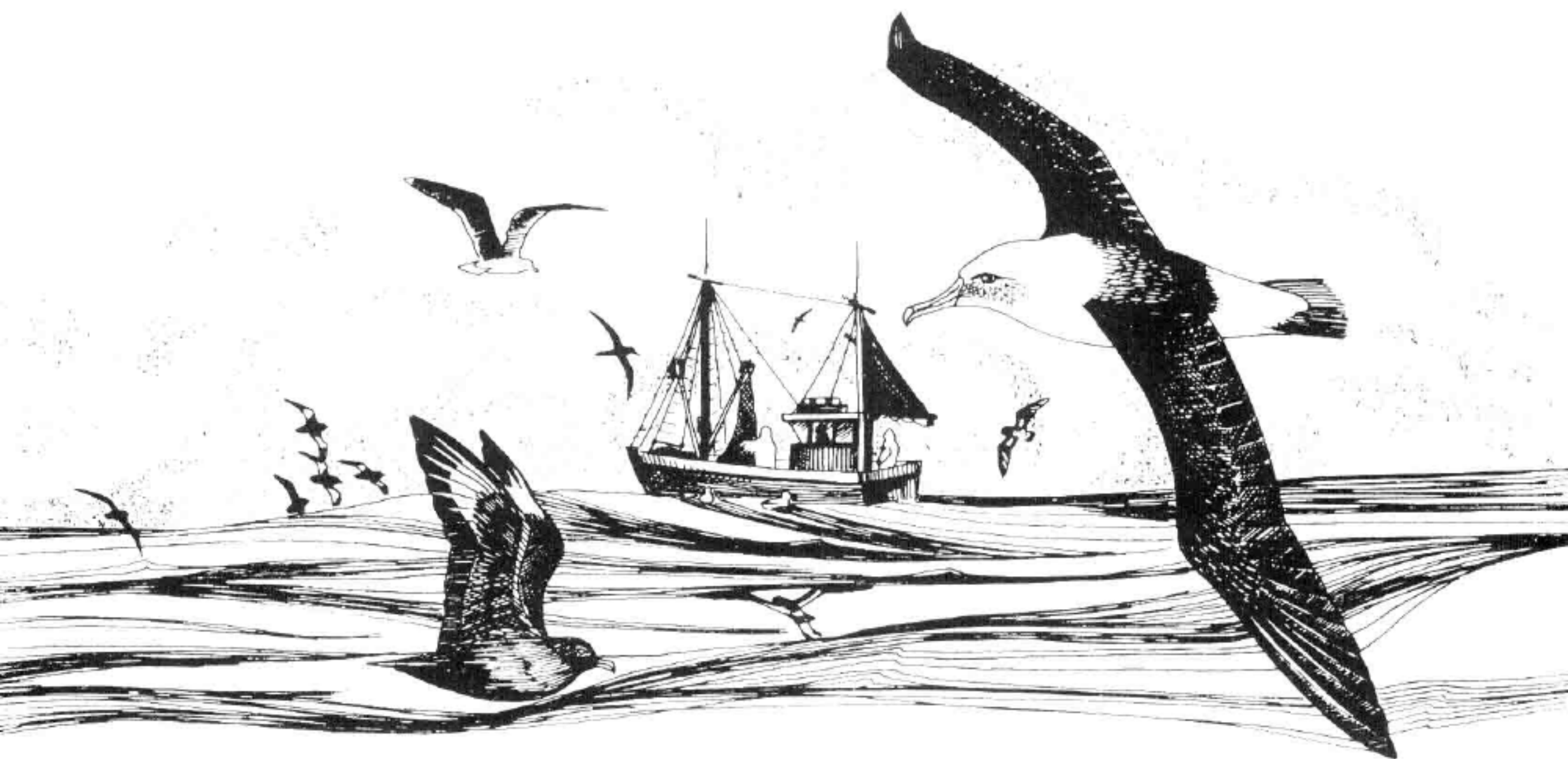
Seabirds are defined here as those species whose normal habitat and food source is the sea, whether they be coastal, offshore or pelagic. Certain fringe orders, notably divers/loons, grebes and pelicans, have been included because at certain times of the year the sea provides some members of their group with their habitat choice and principal source of food. Regrettably, the necessary division of the *Anatidae* to define 'seaducks' including those species which visit bays and coasts during the winter is somewhat arbitrary. Most ducks may visit the coast at some stage of the year, and to include the 140 or so species would be outside the scope of this book. Line drawings of seaducks, and certain geese, however, follow the main text on p. 406, with suggestions for further reading for different continents, most of which have adequate field guide publications covering these groups.

Modern-day research of seabirds can be defined as starting with the publication of *Birds of the Ocean* by WB Alexander in 1928. Since then many researchers have helped to expand the peripheries of our seabird knowledge. Moreover, there has been a dramatic increase in the number of amateur birdwatchers actively participating in seabird research during the last 30 years. This has been responsible in part for the appearance of several seabird groups around the world (p. 22). The recent spate of activity among birders has produced a flood of research material, so much so that it is often impossible to be fully aware of the total material now being published.

It would be wrong to conclude, however, that we know a good deal about seabirds. Present-day research has barely scratched the surface. We know practically nothing of the pelagic dispersal, biology or even breeding areas of some of the species contained in this work. The identification of seabirds can be far more complex than the identification of terrestrial species, which often oblige observers by sitting or perching long enough to enable an accurate identification or, at worst, a hurried note and a sketch. Seabirds are rarely so co-operative. Most are seen from an unstable deck or wind-torn headland, as often as not disappearing behind a moderate swell, reappearing fleetingly and at increasing range. At sea, observations are, therefore, normally far from ideal and many birds cannot be identified specifically. The 'odd job' among a flock of known species usually allows no time for on-the-spot recourse to a reference work and the observer can only record as many characters as possible and hope that later research will yield a positive identification. One should never guess at a bird's identity. Mystery birds will always occur, identification being thwarted by a combination of range, light and often basic inexperience. My own list of personal odd jobs is quite extensive.

Fortunately not all seabirds are seen so briefly. The less pelagic species offer easier opportunities. Gulls especially are dependent to some extent on the activities of man, whilst divers/loons can often be found in sheltered bays of the northern hemisphere during the winter. Those observers fortunate enough to visit the bird islands of the Southern Oceans cannot fail to be impressed by the vast penguin rookeries or by their almost total disregard of the presence of human forms within their ranks. Clearly then it is the fleeting glance of the more pelagic species which will cause most problems to an observer, and to facilitate identification one should be aware of the recognised terms used for describing the parts of a bird (Fig. 1).

SEABIRD IDENTIFICATION CHARACTERS

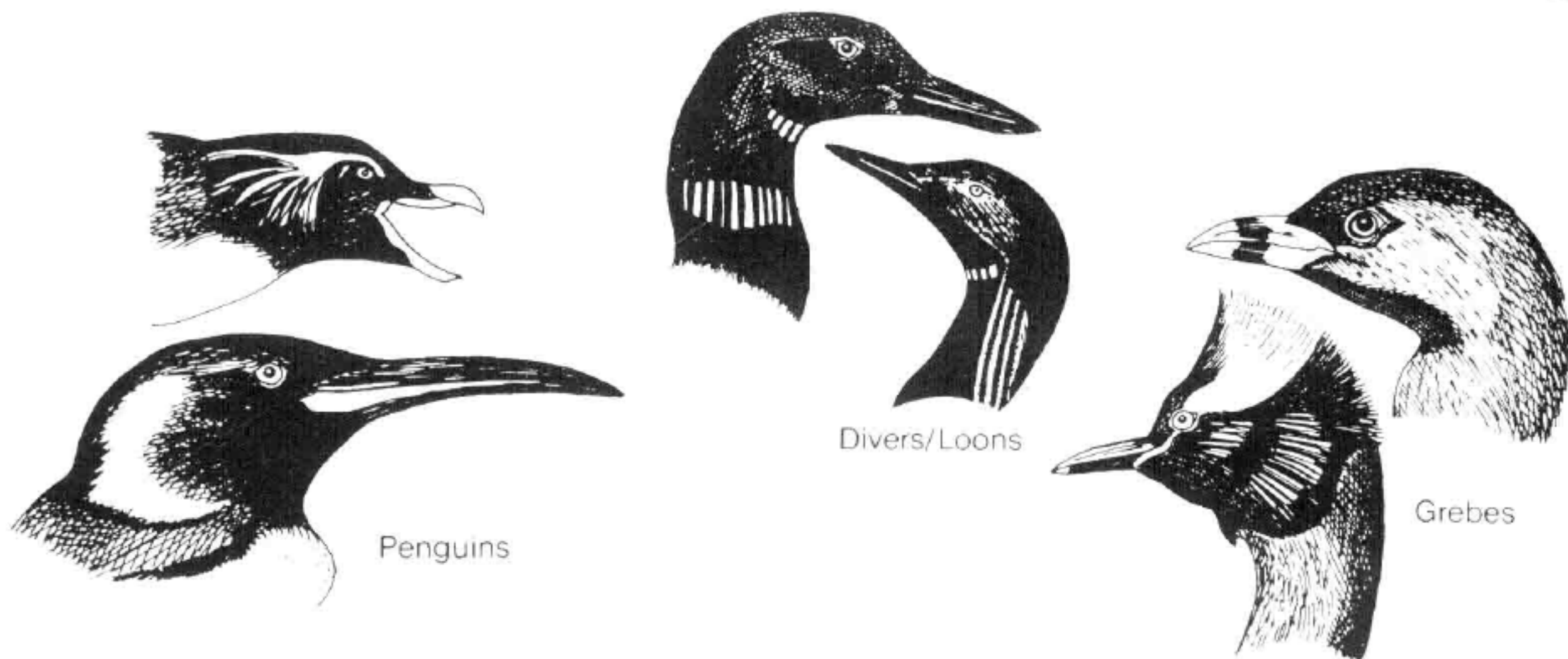


The following discussion is concerned with those characters which enable an observer to identify a bird in the field. In any identification it is important to know what to look for so that in a brief sighting valuable time is not lost looking at unimportant detail. Confronted by one of the smaller albatrosses, for instance, it is quite pointless to spend time deciding whether the upperwings are dark brown or slate-black, or whether the tail is greyer than the mantle. The colour of the bill and the underwing are the key points to get down on paper; if these two points are not recorded an accurate identification is impossible. Many key points can be memorised from books for most of the plumage stages likely to be encountered, but no book (and this one is certainly no exception) can cover all the plumage variations and the tricks that light, distance and incomplete views can play on an observer. These factors which limit our capabilities can be appreciated only through field experience. Once they are known it is possible to compensate for them, because all identifications take several factors into account. If the range of the aforementioned albatross is extreme and the bill colour vague, then the underwing pattern will be the only key identification point on which an identification can be based. An observer must examine critically, therefore, the differences in width of the leading and trailing edges or dark wedge-shaped incursions into the white underwing-coverts.

This guide is concerned with identification at sea but in exceptional cases, e.g. diving-petrels and *Fregetta* storm-petrels, additional material has been included within the text for identification in the hand. Observers who require more detailed measurements should consult Murphy (1936), Palmer (1962), Alexander (1955), Serventy *et al.* (1971) and Cramp & Simmons (1977). The following notes are intended as an introduction to the species accounts given in the main text, and the headings used follow that of the text sequence.

Size: Distance at sea is difficult to judge. Inexperienced observers are more likely to overestimate distance and consequently underestimate the size of a bird. In all cases the dimensions of a bird are most easily judged by comparison with a species of a known size. The relative jizz, discussed below, is also easier to determine in this manner.

Bare parts: In the *Laridae* and *Spheniscidae* the colour of eyes, legs and bill should be one of the first points noted. Bill and leg colour can also be of importance in certain shearwaters, petrels and albatrosses, but the problem here, of course, is that many species fail to approach closely enough to allow such critical examination. Cormorants often have colourful facial skin. In flight the projection of feet beyond the tail point can also be of value in separating similarly-plumaged species. It should be noted that only feet which project sufficiently to be regularly noted are mentioned in the text. For example Wilson's Storm-petrel has feet which project well beyond the tail in flight, whereas the feet of Leach's Storm-petrel also project but by such a small amount that they are rarely, if ever, noted as doing so in the field. Consequently, the main text places little importance on the projecting feet of Leach's Storm-petrel. The bill of any bird tells an evolutionary story and, with a little practice, can be used to classify birds into their different groups or families. Bills are tools, and as such have been modified to suit particular purposes. Each of the main bill types is shown below and observers should familiarise themselves with each type to allow prompt and accurate generic classification of birds sighted.



Penguins, known to all, have a variety of bill shapes but all are stout and covered with several coalesced horny plates. To enable prey to be grasped and held they have caruncles on both tongue and palate.

Divers/loons have sturdy pointed bills, with narrow nostrils. The four species have bills which differ in weight and in angle of tilt, as discussed in the main text.

In grebes bill shape varies from rather diver-like, as in the Slavonian Grebe, to short and sturdy, as found in the Pied-billed Grebe of America.

Albatrosses have long, robust bills which are strongly hooked at the tip, an adaptation for dealing with their principal food, slippery cephalopods. They are unique in that the external nostrils are separate and placed on either side of the culmen (see Fig. 4, p. 221), not joined together over the culmen as in petrels and shearwaters. Bill colour in adult albatrosses is diagnostic.

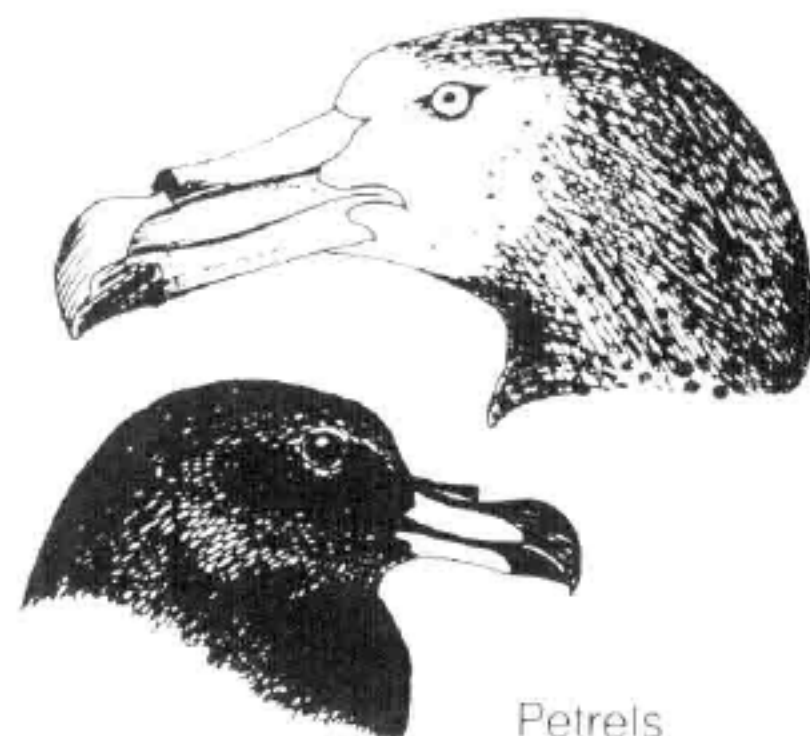
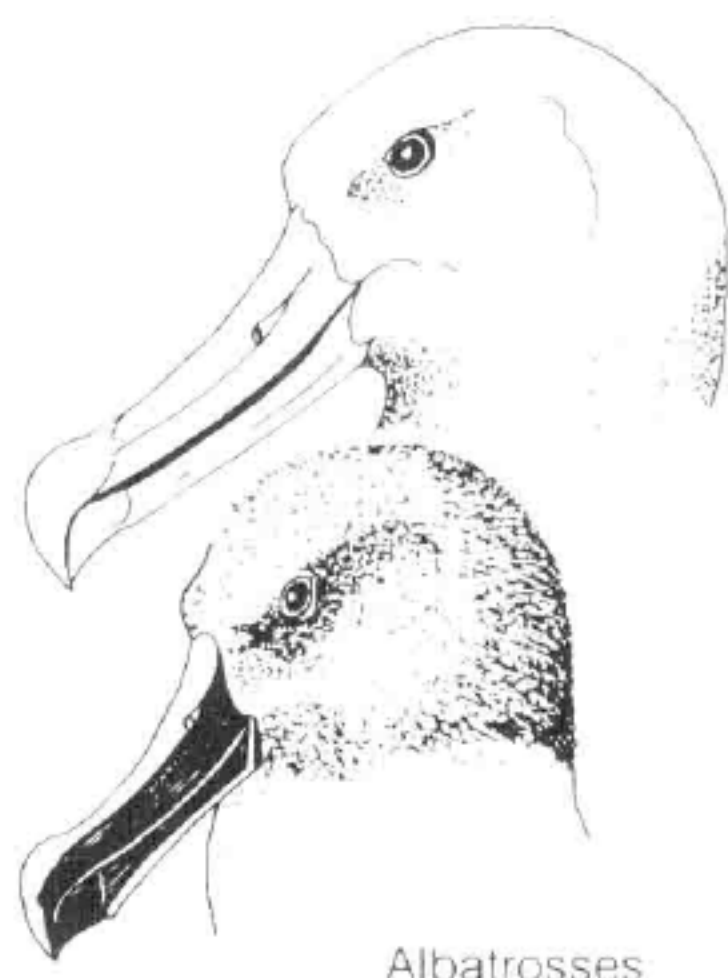
Petrels show a wide variety of bill shapes, from that of the massive giant petrels to the smaller *Pterodroma* petrels, but all have the nostrils united in a single tube over the top of the bill, as do the shearwaters. Petrels, however, have stouter bills which are hooked at the tip, and, with the thicker-set head and neck, are readily separated from the often similarly-plumaged shearwaters.

Prions have a variety of bill shapes. All are hooked, weakly so in some cases, but unlike other birds they have a row of comb-like lamellae on the inside of the upper mandible's cutting edge which is used to strain off plankton. At sea identification is problematic but not impossible.

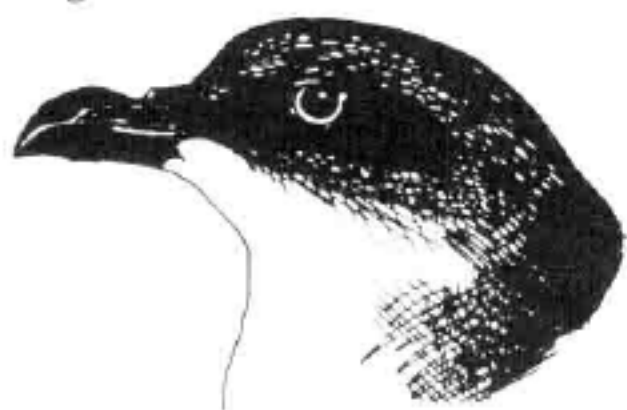
Shearwaters, probably the best known of all the tubenoses, have long, slender bills. Several species have coloured legs and bills which can be diagnostic.

Storm-petrels, the smallest of all seabirds, have hooked bills with a proportionately conspicuous nostril tube.

Diving-petrels, the southern counterpart of the alcids, have rather squat bills with the nostril tubes separated on top of the culmen. Sketches on p. 278 deal with identification in the hand, based on bill shapes of the four species.



Diving-Petrels



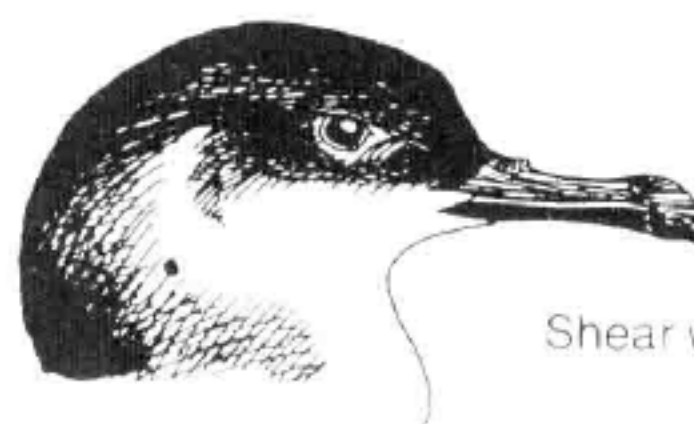
Storm-Petrels

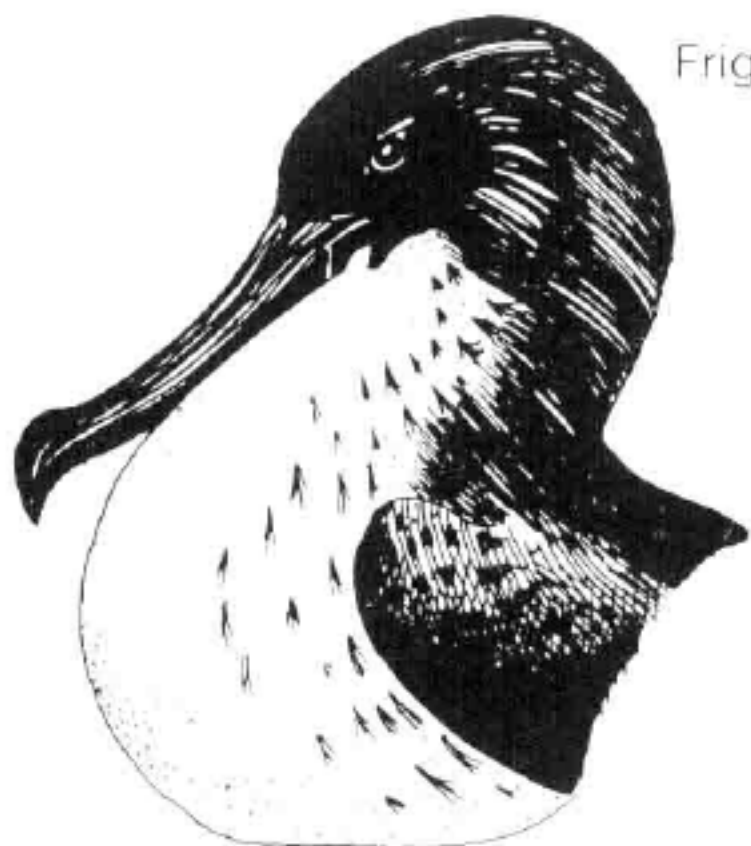


Prions



Shear waters





Frigatebirds



Tropic birds



Cormorants

Frigatebirds have long, slender bills, strongly hooked at the tip and, in males at least, crimson gular pouches which are inflated during courtship rituals. Bill and pouch colours are not identification characters.

Tropicbirds have robust dagger-like bills with serrated edges. This is an indication of their feeding habits: they dive from heights of 15 metres in the manner of a gannet.

Cormorants, a cosmopolitan group, are well known to most people. Bill shape is long, slender and strongly hooked at the tip. For identification purposes the colour of the caruncles and naked skin on the face are useful characters.

Boobies and gannets have long dagger-like bills and often plunge from considerable heights to secure their prey. As in the tropicbirds their external nostrils are closed, but secondary external nostrils have evolved at the angle of the mouth, the opening being sealed off with flexible flaps by water pressure when plunging.

Pelicans need no introduction; their extensible pouches, which can hold up to 3 gallons (13.6 litres) of water, and broad beaks render them instantly recognisable.

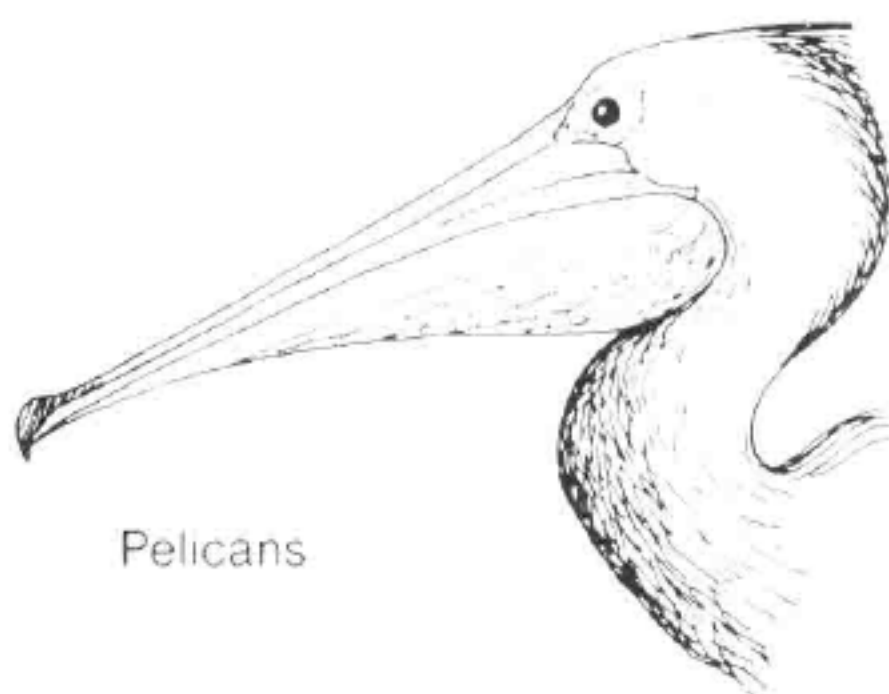
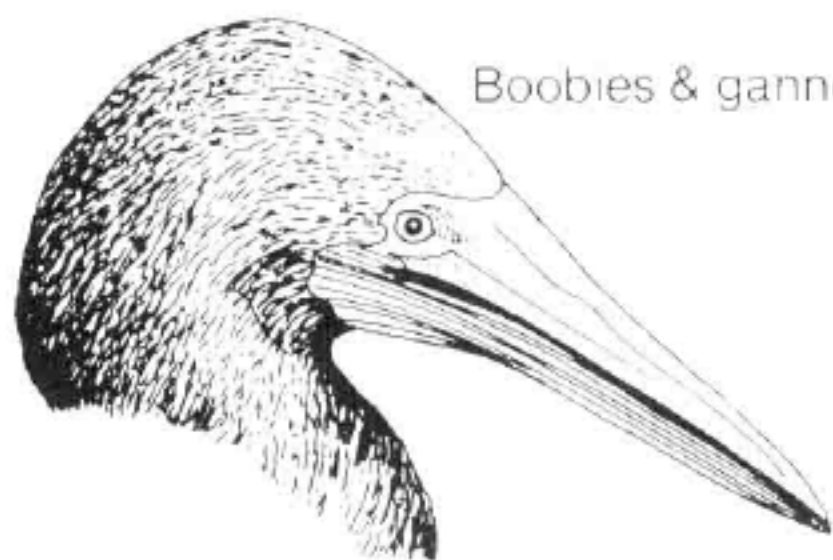
Phalaropes are an offshoot of the wader group. Two of the three species are pelagic outside their breeding season. Their long, thin bills differ proportionately each from the others' and can be a useful means for separating the three species. (See main text, p. 318.)

Sheathbills, as their name implies, have a horny, saddle-like sheath which extends over the base of the upper bill and partly shields the nostrils. They have fleshy wattles at the base of the bill and below the eyes. Bill coloration is diagnostic.

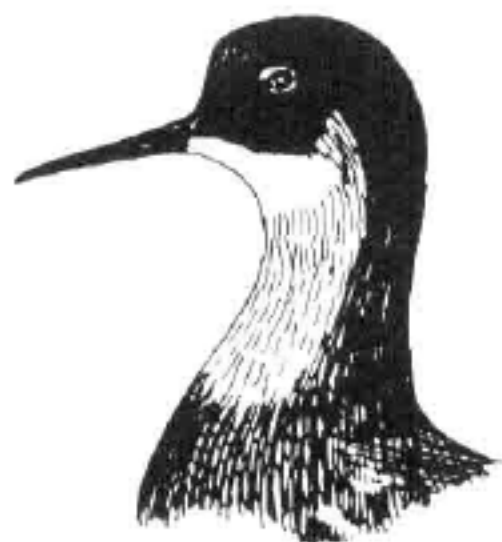
Skuas, piratical and aggressive, have robust, hooked bills and differ from gulls in having a fleshy cere across the base of the upper mandible.

Gulls are well-known, conspicuous birds. Bill shape varies from the robust Pacific Gull to the more slender form found in the European Black-headed Gull. Unlike the skuas, whose bills are made up of four horny plates, gulls have undivided beaks. Bill and leg coloration are important field characters and can simplify identification problems.

Boobies & gannets



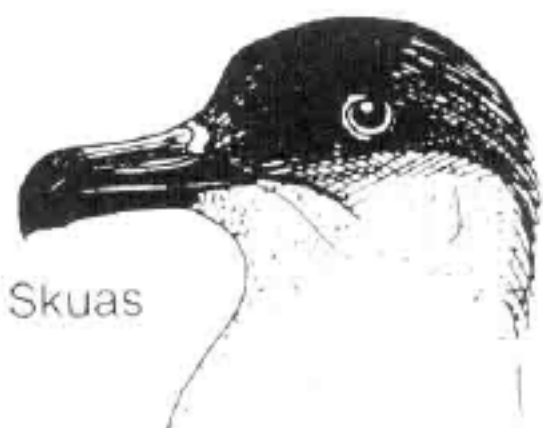
Pelicans



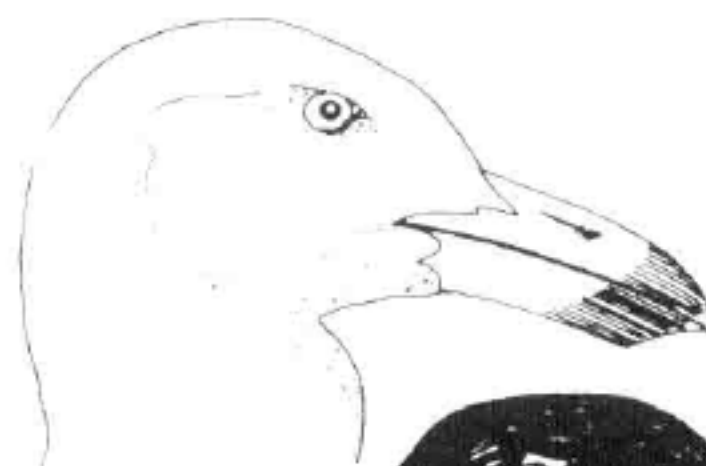
Phalaropes



Sheath bills



Skuas



Gulls

