THE SUNBIRD

Volume 7 Number 2 June 1976

THE BIRDS OF CAPE YORK PENINSULA

JIRO KIKKAWA

INTRODUCTION

Cape York Peninsula is still remote because of limited access to most parts of the region,but about the turn of the century the northern tip was one of the areas of Australia most frequently visited by naturalists and collectors. The Peninsula was then neglected for almost half a century, except for some isolated expeditions. However, interest in this region has been revived as shown by geologists,pedologists, botanists, entomologists, ornithologists,mammalogists, anthropologists and conservationists who have recently conducted surveys (*e.g.* Anon, 1974; Johnson and Hooper, 1973; Lawrie, 1970; Pedley and Isbell, 1971; Stanton, 1976; Sutton, 1976; Walker, 1972; Wilimott *et al.*, 1973). It now seems imminent that this long neglected part of Queensland will have national parks of great significance to ornithology.

During the past eight years I have visited various parts of the Peninsula to study birds and aspects of their ecology. The study is still in progress and this article is intended to summarise previous ornithological work and to review distributional data within the region.

PART 1 ENVIRONMENT AND HISTORY

Three hundred and seventy years ago the Spanish navigator Luis Vaez de Torres sailed through the Strait which was named after him. This Strait was formed during the Pleistocene but since then has been exposed again more than once in the course of glacio-eustatic changes of sea level. The last connection of Cape York with New Guinea has been estimated between 6,500 and 11,000 B.P. and the formation of its present shape as recently as 4,000 to 5,000 B.P. (Jennings, 1972). In the shallow part of the 150 km wide Strait the sea is seldom more than 9 m deep and studded with islands, which are remnants of Carboniferous volcanics (Jennings, 1972).

In spite of their proximity and recency of separation the two land masses have contrasting environments. New Guinea, being a young orogenic island with elevated and complex terrain, has well marked altitudinal zones of climate and vegetation and receives an annual precipitation exceeding 2,500 mm over more than half of the island (Nix and Kalma, 1972). Cape York Peninsula, on the other hand, is part of an old eroded continent with comparatively simple topography and markedly seasonal rainfall. The south-western part of the Peninsula receives about 800 mm of rainfall a year, mostly between December and March. Elsewhere on the Peninsula, particularly in the south east corner and on the east coast towards the northern tip, the annual rainfall is higher (*e.g.* 1,800 mm at Cape York), but it is much less than in New Guinea.

In summer the inflow of moist and unstable air produces the wet monsoon season as well as tropical cyclones accompanied by heavy rain. From May to September the south-east trade winds bring dry air overland. Coastal mountains on the Peninsula are not high enough to cause significant precipitation in this period and the lush vegetation of summer dies off from most parts. Temperatures vary little from a mean daily maximum of 30° - 32°C in summer to a mean daily minimum of 16° - 21°C in winter. Thus the seasons are most marked between the wet and the dry.

The Peninsula proper is usually considered north of the lower Mitchell in the west and Cooktown in the east. However, in the central part the typical peninsular habitat extends further south, thus the line for this paper is drawn along latitude 16°S following the study of plant communities by Pedley and Isbell (1971). The Peninsula then is about 440 km wide at its base and 590 km long, covering about 130,000 km^2. Figure 1 shows the distribution of major vegetation types.

EAST COAST

Islands

Along the east coast the Great Barrier Reef flanks the continent in the southern part of the Peninsula and veers north towards the Gulf of Papua away from the northern Peninsula. Many continental islands with mangroves and fringing reefs occur inside the Great Barrier Reef. On the outer edge of the Reef lies Raine Island (11°35'S,144°1'E). The islands region (I) in this paper includes all islands north of 16°S as far as Bramble Cay (9°8'S,143°52'E) and east of 142°35'E.

In this region 113 species of birds have been recorded from at least 48 islands and coral cays (from Kikkawa, 1976). During the 19th Century this region was visited by the following survey ships: *Mermaid* and *Bathurst* (1819-1821), *Beagle* (1839-1841), *Fly* (1843-1845), *Rattlesnake* (1847-1850), *Herald* (1869), *Challenger* (1874) and *Alert* (1881). The narratives given by Jukes (1847)

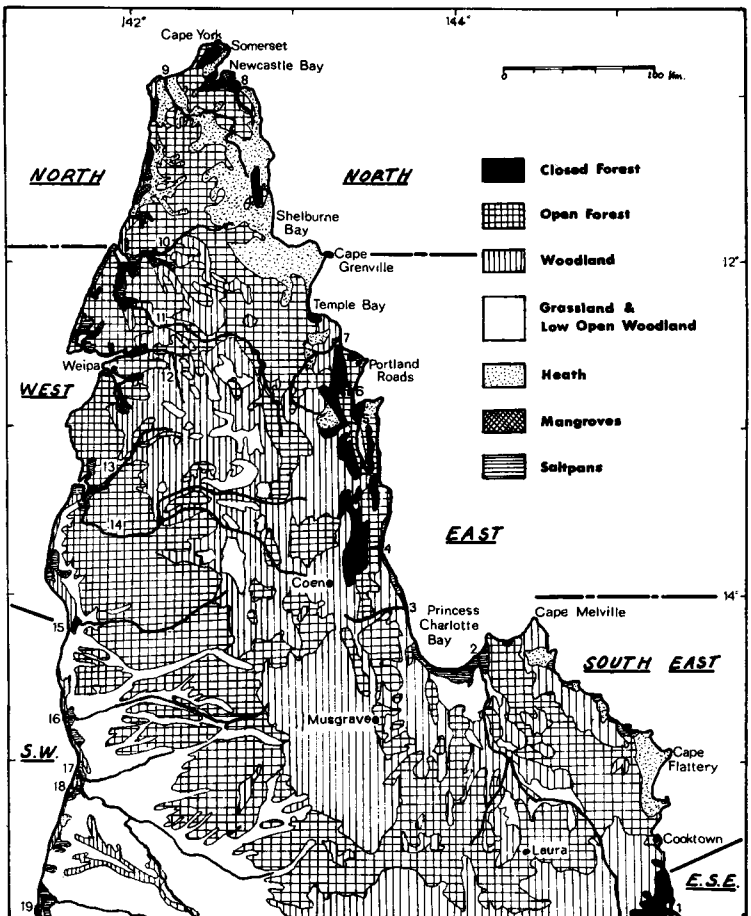

Figure 1. Distribution of major vegetation types in Cape York Peninsula (modified from Pedley and Isbel, 1971). The numbers refer to the following rivers: 1 Bloomfield, 2 Normanby, 3 Stewart, 4 Rocky, 5 Lockhart, 6 Claudie, 7 Pascoe, 8 Escape, 9 Jardine, 10 Dulhunty, 11 Wenlock, 12 Mission, 13 Watson, 14 Archer, 15 Kendall, 16 Edward, 17 Coleman, 18 Mitchell, 19 Nassau.

for the *Fly*, Macgillivray (1852) for the *Rattlesnake* and Coppinger (1883) for the *Alert* contained observations on birds. The first record of the dunlin* in Australia came from Gervase F. Mathew who was paymaster on the *Espiègle* (Hindwood, 1944a). Among the birds he shot in the Claremont Islands in April 1885 were some waders in breeding plumage, including the dunlin and the knot (Mathew, 1885). One of the first records of the wood sandpiper in Australia came from Bird Island near Cape Grenville, where James Cockerell collected a specimen before 1881 (Jones, 1943). W.H. Dudley Le Souëf collected on Hope Island in the southern part of the region in 1896 while Wm. D.K. Macgillivray, a doctor and bird enthusiast of Broken Hill, made an extensive survey of birds in the northern part of the Great Barrier Reef in 1910 and 1913. Gregory M. Mathews described subspecies of the varied honeyeater (1916) from Cairncross Island and of the blue-faced finch (1914) from Lloyd Bay Island. The pale silvereyes collected by M'Lennan in February 1914 on Haggerstone and Forbes Islands are mentioned by Ashby (1925) and the blue-faced finch on Lloyd Bay Island by Marshall (1948). W.B. Alexander (1925) wrote a brief review of the status of sea birds in the Great Barrier Reef, listing 10 important species breeding in large colonies. Since then the region under consideration has been visited by Warham (1961, 1962). The distribution of sea birds in the Great Barrier Reef has been summarized by Lavery and Grimes (1971) and discussed by Serventy *et al.* (1971).

Birds of Raine Island were collected by the expeditions of the *Fly* in July 1843 (Jukes, 1847) and May-June 1844 (J. Macgillivray, 1846) and the *Challenger* in August 1874 (Moseley, 1892). Sclater and Salvin (1878) wrote of Sir John Murray's notes on frigate-birds and gannets, whereas Saunders (1878) referred to terns and gulls, collected by the *Challenger* expedition. Forbes (1878) mentions two males and one young female of the Lewin water rail collected at that time, but according to C.J.O. Harrison these specimens belong to the landrail (Stoddart, 1976). Raine Island is the type locality of the lesser frigate-bird, collected by the *Fly* expedition and described by Gray in 1845. Specimens collected by the *Challenger* expedition were reported to have been those of the greater frigate-bird (Sclater and Salvin, 1878) but cited by North (vol. III, 1912) as the lesser frigate-bird. Two of these specimens were examined recently by C.W. Benson and found to be those of the lesser frigate-bird (Stoddart, 1976). Similarly, a young female red-billed tropic-bird (*Phaethon aethereus)*, the only tropic-bird seen and collected by the *Challenger* expedition (Sclater and Salvin, 1878), appears to be the red-tailed tropic bird.

* The scientific names of all bird species recorded from Cape York Peninsula region are given in the Appendix. Vernacular names listed by CSIRO (1969) are given in parentheses where they are necessary and appropriate.

Raine Island was visited also by W. Macgillivray in October 1910, by William Rae M'Lennan collecting for Macgillivray in July 1911 and by both in December 1913 (Macgillivray, 1910, 1913, 1914). An early account of Raine Island was given in a book written by Alfred F. Ellis (1936), who was New Zealand representative on the Board of the British Phosphate Commission and travelled widely in the Great Barrier Reef. Warham visited Raine Island in February 1959, when he found a Trinidade petrel there by its suspected nest (Warham, 1959, 1961), a unique record of the species on which there has been no subsequent observation in the Great Barrier Reef. K. A. Hindwood, D. L. Serventy and K. Keith surveyed the sea birds of the south east Coral Sea in November 1961 on board the *Gascoyne* and described the status of sea birds on Raine Island (Hindwood *et al.*, 1963). The Royal Society of London and Universities of Queensland Expedition to the northern Great Barrier Reef in 1973 visited Raine Island in early November. Based on this expedition, and an extensive literature survey, Stoddart (1976) wrote a detailed account of the natural history of Raine Island, in which records of 32 species of birds are given. Peter Ogilvie visited the island in 1975 and reported on the unchanged status of large colonies of the nankeen night heron and three species of gannet and on the numbers of the wedge-tailed shearwater, red-tailed tropic-bird, lesser frigate-bird, silver gull and noddy (QOS Newsletter 7 (1), 1976). There is no recent record of the reef heron from Raine Island.

Extreme south east.

The extreme south east (ESE) includes the area south of Cooktown and east of the Normanby River. Here, a northern projection of the rugged eastern highlands has the highest peak (Mt Finnigan, 1,148 m) and receives the highest rainfall within the Peninsula. The area of tropical rain forest (vine forest) extends northward to Mt Amos (860 m) about 25 km south of Cooktown.

Birds in this region were collected by W. B. Barnard and his English friend, Albert S. Meek, who worked in the Bloomfield River (3 months) and Cedar Bay area (7 months) in 1893, collecting for the Tring Museum (Meek, 1913). Le Souëf also collected in the Bloomfield area during the same period, based at "Wyalla", the property of G. Hislop. He was assisted by W. B. Barnard's brother, Harry Greensill Barnard, in this trip. When he returned there in 1896 he climbed Mt Peter Botte (Mt Pieter Botte) accompanied by one of G. Hislop's sons, Frank (Le Souëf, 1897a). He also worked around the Bloomfield River and Hope Island with Frank's brother, Robert (Le Souëf, 1897b). Le Souëf noted the presence of the chestnut-breasted cuckoo and the absence of the fan-tailed cuckoo in the Bloomfield area. The Australian pied flycatcher, thought to be a new species (Gould had already described it), was described by Archibald James Campbell (1895) from the collection made during Le Souëf's first visit (Le Souëf, 1894). His collection of bird eggs was described by Alfred J. North of the

Australian Museum and A. J. Campbell of Melbourne. The Barnard brothers and their father, George Barnard, also supplied field notes to Campbell. The Hislop family and E. A. C. Olive of Cooktown collected skins and eggs of birds from this region and supplied notes on the breeding habits of birds to North (North, 1901-1914). In the Archbold Expedition of 1948, one of the largest and best organized biological expeditions to visit the Peninsula, mammals were collected by George H. H. Tate and Hobart M. Van Deusen for the American Museum of Natural History and plants by L. J. Brass for the Arnold Arboretum of Harvard University (Brass, 1953). Donald P. Vernon from the Queensland Museum joined the expedition at Portland Roads and collected birds in the eastern and south eastern parts of the Peninsula. They spent September, their last month in the field, in this region and Vernon collected as far south as Mt Finnigan. He discovered that the white-streaked honeyeater was distributed as far south as Shipton's Flat in this trip (Mack, 1953). Glen M. Storr (1953), while based at Cooktown from August 1948 to July 1949, spent most of the wet season observing birds in this region. He found most of the species from the Atherton Tableland in the rain forest of Big Tableland on the south western slope (670 m) of Mt Amos. At the beginning of the dry season in 1964, the Hall expedition of the British Museum was based at Ayton to collect the lowland fauna about the Bloomfield River and at Big Tableland to collect the highland fauna. Nancy Hopkins (1972) visited Mt Poverty in 1971 and confirmed the earlier reports of Storr (1953) and Roy Wheeler (1967) that the black-backed magpie and the pied butcher-bird were absent from this area. Most recently the Australian Museum and the Queensland Museum joint expedition spent sometime in this region at the beginning of the wet season in 1975 and Vernon and Ingram recorded the chestnut-breasted cuckoo among other species (Queensland Museum, 1976).

South east.

Between Cooktown and Princess Charlotte Bay dry dissected country with open forest and woodland forms a significant barrier against the dispersal of rain forest animals. Sand dunes are developed between Cape Bedford and Cape Melville supporting heath and other wallum vegetation. Very little rain forest occurs in this region. The Normanby River has an extensive delta and young alluvial plains carry Jack Lakes as a prominent freshwater habitat. Here regular flooding occurs in the wet season, rather like the west coast of the Peninsula. In the "Gilgai Country" of black soil and uneven surface, termite towns flourish in open grassy woodland, which is often burnt during the dry season. A large belt of sandstone country harbouring caves with aboriginal drawings occurs south of Laura township. South of Musgrave the Dividing Range appears broken and the low lying country connecting Princess Charlotte Bay with the Gulf of Carpentaria forms a semi-arid corridor. Loamy soils,with dense grass in the low woodland of *Melaleuca* and eucalypts,and sandy soils,with an open forest of

eucalypts, occupy this flat country (Pedley and Isbell, 1971). Some permanent streams in this region are fed by springs. The area between Musgrave and Cooktown extending north to the southern part of Princess Charlotte Bay and south to the Palmer River is termed the south east (SE) in this paper.

The written history goes back to 1770 in this region, when Joseph Banks accompanied by Daniel Carl Solander, a Swedish naturalist, collected plants during the seven weeks of repairing the *Endeavour* at the mouth of the Endeavour River (Beaglehole, 1955). The pale-headed rosella described by Latham in 1790 appears to have been acquired then. Cooktown was founded here in 1873 following the discovery of gold by the William Hann expedition, which searched for minerals in the southern part of the Peninsula in 1872. H. C. Robinson recorded mammals of the Cooktown area in 1899, and also described the buff-breasted quail from Cooktown (synonymized with the chestnut-backed quail). He and W. S. Laverock (1900) listed birds collected for the Liverpool Museum by E. A. C. Olive and described a subspecies of the blue-faced honeyeater. The first proof that any rain forest bird peculiar to the Peninsula occurred as far south as the Endeavour River came from a specimen of the Cape York race of the spectacled flycatcher reported by North (vol. I, 1901-1904). W. Macgillivray spent eight days around Cooktown on his way to the northern part of the Great Barrier Reef in October 1910 (Macgillivray, 1910). Mathews described 20 subspecies from the Cooktown area between 1911 and 1918. He also described a subspecies of the red goshawk from Cedar Bay, south of Cooktown. Cooktown is the type locality for only one species, the Macleay honeyeater, described by E. Pierson Ramsay in 1875. It is interesting to note that this species is a rain forest bird having its northern limit of distribution in the scrubby hills south of Cooktown (Storr, 1953). Many water birds were recorded, among other species, between Cooktown and Fairview west of Laura by Storr (1953) and some were collected by Vernon and described by George Mack (1953). In the present study a black swan was recorded in the Lakefield area in November 1969 (the only record from the Peninsula). No expedition has yet been made to a large tract of heath and sand dune areas between Cape Bedford and Cape Melville.

East.

The Peninsula road north of Musgrave climbs the Dividing Range through scattered cattle stations in open forests and crosses the Range to the western watershed about Coen at an elevation of less than 500 m. Along the east coast north of the Stewart River the saltpan extends to the mouth of the Rocky River and the Nesbit River. Here the dry belt is interrupted by extensive rain forests of the "Rocky Scrub". The Great Dividing Range runs close to the east coast rising to 823 m in the McIlwraith Range. There is a well developed monsoon forest along Lankelly Creek on the western slopes of the range, where some tall Indo-Malayan type forests

of 30 m in height consist almost entirely of deciduous trees. On the seaward slope an altitudinal sequence is evident from the dense coastal lowland rain forest to simple rain forest in the mountains where hoop pines appear as emergents on ridges. North of the McIlwraith Range, rain forest forms a narrow belt behind the Lockhart River and, except for a few small gaps created by woodland formations, it is contiguous with the rain forest of the Iron Range. At Iron Range, rain forest vegetation is extensive over the Claudie Basin and the eastern slopes of the Dividing Range, where Mt Tozer rising to 545 m is covered with heath vegetation at its western foot and dense contorted shrubs on its higher slopes and granite top. The rain forest of the McIlwraith Range-Iron Range area may be regarded as a single complex because of its geographical isolation from other areas of rain forest on the Peninsula.

The inland road crosses the Archer River with a wide bed of granite boulders and sand, and runs straight through an extensive woodland until the Wenlock crossing is reached. In the woodland, however, there are a number of narrow winding creeks lined with strips of deciduous vine thickets with thorny shrubs and emergent *Bombax*. The creek beds are exposed in the dry season. Where there is permanent water, the riverine rain forest often contains palms and emergent *Melaleuca leucadendron*. Interesting features of vegetation north of the Wenlock are the appearance of relict cycads as a sparse shrub layer of woodlands and rounded patches of rain forest surrounded by frequently burnt woodlands. The area east of the Telegraph Line between Coen and the Dulhunty River extending to the coastal areas between the Stewart River and Temple Bay is termed the east (E) in this paper.

Ornithological collection in the east lagged behind activities in other parts of the Peninsula. However, the ill-fated expedition of Edmund Kennedy reached the mouth of the Pascoe River in November 1848 after 6 months of overland travel from Rockingham Bay. Only two men of the main party left at the Pascoe River survived till a rescue party reached them: all scientific collections as well as their livestock were lost. The others attempted to reach Port Albany, but Kennedy was speared by natives and only Jackey Jackey survived to lead a rescue party. Thomas Wall, a naturalist on the expedition, discovered the cassowary and one was shot by Jackey Jackey, a native collector, on 4 November. Wall did not survive the expedition but his brother, Wm S. Wall, described the bird in Illustrated Sydney Herald (3 June 1854). The only other description of birds before the turn of the century was made by George Masters, who was on the *Chevert* of the Sir William Macleay Expedition and described the pale silvereye and grey shrike-thrush in 1876 (not accepted as new species) from the collection of birds obtained at Cape Grenville in June 1875. The mangrove golden whistler was also collected for the first time at Cape Grenville. A summary of Macleay's Journal during the voyage was published by Fletcher (1929) and a popular account of the voyage was written by Macmillan (1957).

M'Lennan heard of a parrot inhabiting the Pascoe area which he thought from descriptions to be an eclectus (red-sided parrot). In July 1913, W. Macgillivray allowed him to proceed to this area and M'Lennan collected not only the eclectus parrot (one male, two females and a clutch of two eggs) on the Claudie River (Macgillivray, 1914), but also a pair of red-cheeked parrots on the Pascoe River. Macgillivray (1913) described the latter as a new species and genus and this extraordinary discovery of two new species of parrot from Australia was featured in *Emu* in 1914 by Mathews, who described both as subspecies of the New Guinea forms (Austral Avian Record, 1913 and Birds of Australia, 1917). Macgillivray himself visited the Claudie River in November 1913, accompanied by his son Ian and J. A. Kershaw (Curator of the National Museum in Melbourne) and guided by M'Lennan (Kershaw,1914). Mathews described as new species the green-backed honeyeater from the Claudie River and the masked owl from the Pascoe River in 1914 (both were given subspecies status later) and as new subspecies the black-winged flycatcher, little red-browed finch (red-browed finch), pale crimson finch (crimson finch) and magnificent rifle-bird from the Claudie River area in 1917. M'Lennan later (1921-1922) collected for H.L. White in the southern part of the east based at Port Stewart (White, 1922a). He spent the wet season in the Rocky Scrub and the rest of his nine months' stay between Port Stewart and Coen. On this trip M'Lennan discovered caterpillars living in the nest of the golden-winged parrot eating the faeces of young birds. This moth, named *Neossiosynoeca scatophaga*, was thus found to be commensal with young parrots inside the termite mound. Thomson (1935), who examined 20 to 30 nests, found a mass of pupating caterpillars like a honeycomb in every nest that contained young birds. M'Lennan's collection from this trip went to the H. L. White Collection at the National Museum, Melbourne, and contained a large form of the pied currawong (White, 1923) and its eggs (White, 1922c) and a small form of the squatter pigeon (White, 1922b) and its eggs (White, 1922c), all collected in the Coen area. Mathews described a subspecies of the buff-breasted quail from Coen in 1922.

In 1923 the first large scale scientific expedition to the northern Peninsula was led by Sir G. Hubert Wilkins collecting birds and mammals in the Temple Bay area for the British Museum (Wilkins, 1928). The support of the Commonwealth Government made it possible to publish detailed accounts of birds observed and collected by Donald F. Thomson (1935) during his three separate expeditions to the Peninsula, which were supported by the University of Melbourne for the study of the relation between Aboriginal man and nature. Thomson in the east was based at the Stewart River in the dry seasons of 1928 and 1929, making an overland trip to the Lockhart River towards Lloyd Bay as well as to Coen and Ebagoola on the way to the Gulf in the first season, and another trip to Bare Hill near Cape Direction in the second. In his third and longest expedition Thomson spent the dry season of 1932 in the Lloyd Bay area. His description of birds is

accurate and his information is reliable. He recorded a large number of brolgas at the mouth of the Rocky River and other species typical of the interior in the Stewart River area, such as the galah, red-winged parrot, grey-crowned babbler, blue-faced honeyeater, yellow honeyeater and black-tailed finch (black-throated finch). Tom Iredale (1946) described Marshall's fig parrot (fig parrot) from three specimens collected by the then Captain A. Jock Marshall behind the Lockhart River in September 1942. This was the last new species of bird to be described from Cape York Peninsula. Though not recognized as a full species (even its subspecies status was doubted by Mayr, 1947), it is now considered a valid subspecies and the publication of its description resolved the question of three races of fig parrot in Australia (Forshaw, 1967). The Archbold expedition of 1948 worked in the Iron Range and McIlwraith Range areas from 29 May (Portland Roads) to 28 August (Ebagoola) and Vernon collected, among other species, a specimen of the Lewin honeyeater from the McIlwraith Range (Mack, 1953). This was a significant zoogeographical discovery, for not only was the known range of the species extended by some 300 km to the north but it also represented the only species of highland bird to show a disjunct distribution to the rain forest of the Peninsula. Among the rare waders of the region, Storr (1973) listed the long-toed stint from Coen.

Since the wartime airfield at Iron Range and its all weather supply road to Portland Roads have been maintained postwar and commercial airlines have developed regular flights there, Iron Range with its surrounding rain forest areas has become one of the best known birding sites, attracting both Australian and overseas ornithologists. Among those who have made field notes on the distribution, behaviour and breeding of birds in the Portland Roads/Iron Range/Mt Tozer area in recent years were Brigadier Officer, Joseph Forshaw, James Bravery, Michael Sharland, Eric Zillman, Billie Gill and others. I visited Iron Range at the beginning and end of the dry season in 1968 and the McIlwraith Range at the end of the dry season in 1969. The Bird Observers' Club of Victoria had a campout at Iron Range between 2 and 19 August 1970 (Johnson and Hooper, 1973). Their records of the white-headed pigeon, large-billed scrub-wren and yellow robin are not accepted here and confirmation is required of their first record of buff-breasted warbler, yellow silvereye and pied butcher-bird from Iron Range. During the recent trip of the National Photographic Index of Australian Birds Expedition to Iron Range in 1975, Eric Zillman, Kerry Muller and Chris Cameron recorded the little grassbird and mangrove golden whistler there for the first time (Trounson, 1975). In February 1976 our netting team banded 88 birds from 14 species at Iron Range. A total of 257 species have been recorded from this area by various visitors; 22 of them require confirmation.

NORTH COAST

North of Temple Bay there is a great tract of sand dunes, at least 10 km wide. Exposed to the south-east trade winds the stabilizing dense turkey scrub *Leptospermum fabricia* grows almost horizontally. "Wallum" vegetation with *Banksia, Grevillea* and *Melaleuca* is formed between swale lakes and blowouts of sand, and old dunes carry simple rain forest. Behind the foredunes or sand ridges in the northern part of Shelburne Bay is the northernmost stand of hoop pines in Australia. Inland from this area there are cypress forests on the lowland and patches of rain forest, rich in lawyer vines, on the escarpment of the Dividing Range. The rain forest patches are surrounded by low canopy scrub vegetation and tall open forest of sclerophyll trees. The coastal dune system is interrupted by a very extensive mangrove formation connecting the Escape River delta and Jackey Jackey Creek towards the northern end of the Peninsula. The coastal dunes reappear with a wide range of associated vegetation in the northern part of Newcastle Bay, where they extend inland about 4 km to embrace several lakes south west of Somerset.

Between the two west flowing permanent rivers, the Dulhunty and the Jardine, there are extensive heathlands and scrub without trees. Along the Jardine, the northernmost permanent river, gallery rain forest is developed, and further north the low woodland and heath give way to tall open forest of *Eucalyptus tetrodonta* and *E.* sp. aff. *polycarpa* near Bamaga. The northernmost patch of rain forest, known as the "Lockerbie Scrub", is located between Bamaga and Somerset on Mesozoic sediments of the Dividing Range rising to about 150 m in altitude. North of the Dulhunty River, including the east coast north of Cape Grenville, is considered as the north (N) in this paper. Cape York as a collecting locality generally refers to the northern tip of the Peninsula between Peak Point and Somerset along the coast and inland to the Lockerbie Scrub.

The north is rich in history of exploration and collecting. The first identifiably described Australian bird appears to be the Torres Strait pigeon recorded in 1606 by Diego de Prado during the voyage of Torres (Whitley, 1970). Cape York was named by Cook, who hoisted the Union Jack on Possession Island in 1770 to declare the formal possession of the eastern coast of "New Holland" in the name of King George III. Mathew Flinders on the *Investigator* surveyed the northern coast in 1802, landing on Torres Strait islands and on the west coast of the Peninsula. In his survey Philip Parker King (1826) also passed Cape York in the *Mermaid* and the *Bathurst* between 1818 and 1821, landing on Booby Island and Cairncross Island. The survey ships had naturalists on board collecting plants and animals. Although the varied lorikeet said to be collected at Cape York was illustrated by Lear in 1831, the first description of birds from the northern tip was not made until collections from the voyage of the *Beagle* in 1839 and 1841 reached

John Gould. Captain Stokes, Lieutenant Emery and Benjamin Bynoe were mentioned by Gould (1865), who described the mangrove kingfisher in 1842 (not recognized as new) and the yellow honeyeater and the varied honeyeater in 1843. The type locality of these species was given as Cape York, but the *Beagle* does not appear to have made a landing on the mainland. The landing made by the *Fly* at Evans Bay in June 1845 is considered to be the first mainland landing around Cape York itself (Jukes, 1847). On board the *Fly* commanded by Captain Blackwood were two naturalists, J. Beete Jukes and J. Macgillivray, who made extensive notes on birds. Macgillivray returned to Cape York as a naturalist in the *Rattlesnake* during 1847-1849 (Macgillivray, 1852) and later settled in Australia. He was accompanied on the *Rattlesnake* by Thomas Huxley, who was then an assistant surgeon but illustrated the narrative of Macgillivray, and by James Wilcox who collected some of the type specimens of birds during the ship's extended stay at Evans Bay in 1848 and in 1849. The birds collected by them were examined by Gould at the British Museum and as a result Cape York became the type locality for many widespread species of north eastern Australia, *viz.* the white-tailed kingfisher, northern scrub-robin, boat-billed flycatcher, white-eared flycatcher, lovely wren, yellow figbird and fawn-breasted bower-bird. Gould's descriptions of the wompoo pigeon, tawny-breasted honeyeater and pale-headed rosella from Cape York as new species were not valid. Other species described from Cape York in the 1850's but not recognized include the pale-headed rosella (Bonaparte), the manucode (Gray) and the rufous shrike-thrush (Gray).

In 1863 John Jardine was the first posted at Somerset to administer the sea traffic around the Cape. From his two years' stay Jardine wrote of the native tribes and natural history of the area including observations on birds (Jardine, 1866). In 1866 and 1867 Cape York became the type locality of the graceful honeyeater, lesser Lewin honeyeater and chestnut-breasted cuckoo, which were described by Gould. The graceful and lesser Lewin honeyeaters were confused and were even considered to be the same species by some (*e.g.* Ramsay, 1888). However, A. B. Sharpe, in his report of the voyage of the *Alert*, confirmed the identities of the two species. In his first visit to Cape York in 1867 on board the *Salamander*, which served the Somerset settlement from Sydney, Cockerell stayed for 17 months collecting birds with J. A. Thorpe. Among his collections was the white-streaked honeyeater, which Gould named after him. Thorpe's field observations of birds and nests were sent to North in Sydney. In this period Gould also described from Cape York the mangrove robin, rufous-breasted bronze cuckoo and striated sittella, all of which were valid species. Gould also described a little tern from the Torres Strait in 1871, but it was not recognized as a new species. Other descriptions from Cape York by Gould (black-throated warbler (fairy warbler), spectacled flycatcher, noisy pitta, purple-crowned pigeon), Ramsay (brown-backed honeyeater), Gray (shining starling) and Elliot (magnificent riflebird) were also not recognized as new. The *Challenger* expedition (1873-1876) collected 61 skins of 37

species from Cape York and Raine, Wednesday and Booby Islands in 1874 (Forbes, 1878). At the end of 1874 Luigi Maria d'Albertis came to Cape York and spent two months at Somerset during the wet season. He was on his way to New Guinea to collect for the Museo Civico of Genoa. From his trip Cape York became the type locality for the black-backed butcher-bird described by Salvadori and D'Albertis. Salvadori also described the black-winged flycatcher and spotted owl (boobook owl) from the D'Albertis' collection at Cape York, but these species had already been described elsewhere.

With the Macleay expedition in the *Chevert*, Masters visited the Cape York area in June 1875 on the way to New Guinea and collected birds as well as insects. He collected one of the first specimens of the common tern known from Australia on the Warrior Reef (Hindwood, 1944b) and described the scrub fowl (not recognized) from Torres Strait islands. He also described the little tern (not recognized) and the robust whistler (mangrove golden whistler, now a subspecies) from Cape York. Gould's description of the little scrub-wren with Cape York as the type locality appeared in 1875. In contrast to the Macleay expedition, Samuel White's expedition in 1880 (collectors: J. Cockerell and F. W. Andrews) was a total failure due to mutineers in his schooner, which was brought to Thursday Island. White's diaries and collections also disappeared (Campbell, 1900). Most of the collections made by the *Alert* in 1881 were sent to the British Museum and catalogued by R. B. Sharpe over several years (Sharpe, 1906). Kendal Broadbent's first visit to Cape York was in 1874-75 but he returned to Somerset in early 1884 and in March 1895 to collect more birds and mammals. He was an independent collector who later joined with the Queensland Museum. In early days Cape York was obviously one of the most favoured collecting localities in Australia and by 1888 the distribution of at least 234 species of birds at Cape York had been confirmed (Ramsay, 1888).

The first successful overland travel to Cape York was made by Jardine's sons, Frank and Alick, who started from Carpentaria Downs in October 1864 with 250 head of cattle and 42 horses. They reached Somerset in March 1865 after a series of mishaps. John Jardine left Somerset that year, but Frank remained there to run his cattle and also held his father's old post at Somerset for three periods (Anon, 1974). He bought the buildings at Somerset when the Government post was shifted to Thursday Island in 1879 and lived there till he died in 1919. In the meantime, a mineral search of the Peninsula was conducted in 1879-1880 by Queensland Government Geologist R. Logan Jack, who later published a detailed history and geography of Cape York Peninsula (Jack, 1921). The Cape York Telegraph Line was completed in 1886 terminating near Peak Hill, a few miles west of Cape York. This facilitated travel through the inland as well as communication to and from Cape York. Frank Jardine wrote about birds himself (Jardine, 1904), but more significantly he acted as host to many collectors who came to Cape York. He built another house at Lockerbie which was visited by many biological expeditions

collecting in the nearby rain forest ("Lockerbie Scrub"), the richest and most extensive in the north. Harry Barnard collecting birds and eggs for Le Souëf in 1896-1897 and for H. L. White in 1910-1911 (Barnard, 1911), and M'Lennan collecting for W. Macgillivray, worked in the Lockerbie Scrub (Macgillivray, 1910, 1912, 1914, 1917, 1918). Le Souëf described the frill-necked flycatcher and brush turkey from Barnard's collecting at Cape York, but neither species was valid. Barnard was based at Lockerbie while M'Lennan, after the visit of Macgillivray in 1910, stayed at "Paira" in Muddy Bay, the home of Bert Vidgeon, Frank Jardine's son-in-law. Robert L. Jardine, another member of the family, sent bird notes to Alfred North of the Australian Museum. Unfortunately, White in Melbourne and North in Sydney did not communicate with each other and, although A. J. Campbell (1900) cited the work of North for many species, North ignored the work of both Campbell and White (Serventy, 1972). M'Lennan visited many localities between Cape York and Raine Island with Vidgeon and his name was entered in the Somerset visitors book in 1910, 1911, 1912, 1914, 1915 and 1916 (Anon, 1974). In recent times the Archbold expedition spent April-May 1948 (Brass, 1953) and Brigadier H. R. Officer spent November 1963 and December 1965 (Officer, 1967) at Lockerbie.

John Porter Rogers in August-September 1909 and Robin Kemp in 1912-1913 collected birds intensively at Cape York for Mathews, who described at least four species and 50 subspecies of birds from Cape York between 1912 and 1922. One of the subspecies he then described stands as a valid species today (helmeted friarbird). Other interesting examples include the uniform swiftlet (the only specimen known from Australia was collected by Kemp in September 1913 at Peak Point), the white-faced robin at "Paira", the willie wagtail (a rare species at Cape York), the bridled tern in the Torres Strait and the white-streaked honeyeater at the Jardine River. The white-faced robin was relatively rare at Cape York but had already been described from there by Hall (1899) as a new species (not valid) and by Rothschild and Hartert as a subspecies. Ernst Hartert (1899) described five other species and subspecies from Cape York, but three of them (black-throated finch, star finch, grey-breasted silvereye) are not otherwise known from the north. Besides, A. S. Meek, one of the collectors mentioned, only collected around Cooktown. Thus his locality of Cape York is in doubt and not accepted for the distributional records. Hartert also listed the white-bellied swiftlet (glossy swiftlet) from Cockerell's collection as taken at Cape York, but the only reliable record of this species at Cape York appears to be that of Mathews (1936) of a specimen collected by M. Flood. C. W. De Vis at the Queensland Museum described the frill-necked flycatcher (1895) from Cape York and A. J. Campbell the red-browed finch (1901) from Cape York and the forest kingfisher (1911) from Lockerbie, but these species had been described earlier. Mathews described two more new subspecies from Cape York in 1941. However, since the two species to which

they belong, the spotted catbird (catbird) and large-billed scrub-wren, are not found at Cape York, the locality given by Scott who collected the specimens is not accepted here. There is a record of the barn swallow taken from Cape York in October 1860 (Condon, 1967), but Ramsay (1888) listed the eastern swallow *(Hirundo javanica)* instead, referring to Sharpe's record in the Catalogue of Birds in the British Museum (collected by Raynor on the *Herald* in 1869). Because Sharpe's records of specimen localities were often incorrect (*e.g.* the eastern whipbird from Cape York) these were not used to substantiate any distributional record. A dark large form of the spotted owl collected by New at Cape York was described as a new species by Neville W. Cayley in 1929, but this was considered to be a subspecies found in the rain forest south of the Peninsula (Condon, 1975). Unless it is a migrant it cannot be expected to occur at Cape York where a smaller and lighter form is known. In the absence of the description of the exact locality, its distribution to Cape York is not accepted here.

In our study the Cape was visited in winter of 1974 and in summer of early 1975. A total of 125 birds (17 species) have been banded at Lockerbie and Lake Boronto. The Heathlands area was visited in the dry season of 1975 and in the wet season of early 1976. A total of 187 birds (24 species) have been banded at localities between Gunshot and Cockatoo Creeks along the Telegraph Line and Captain Billy Landing in northern Shelburne Bay. The brown honeyeater was found in the heath near Gunshot Creek and the brown pigeon, catbird and cassowary (needs confirmation) had the northernmost distribution in the Heathlands rain forest.

A total of 121 species have been recorded from the islands of Torres Strait (Storr, 1973). A fauna survey of the Torres Strait by the Australian Museum in 1975 was joined by Glen Ingram (1976) who added another 22 species for the region.

WEST COAST

West

The northern part of the Gulf coast receives a higher rainfall than the south west. In the north western Peninsula there are swamps, saltpans and mangroves at the mouths of west flowing rivers and along tidal creeks running behind the low coastal ridges. Some creeks have palms in them. Around Weipa the old land surface is much weathered and bauxite nodules appear extensively. Here *Eucalyptus tetrodonta* forms an extensive tall open forest. Small patches of rain forest are found in it as well as along parts of the Mission River and adjacent to the coastal mangroves. South of Weipa the open forest grows on the depositional land surfaces dissected by shallow open valleys with siliceous hardpans (Galloway and Lofflen, 1972). The western region between the Dulhunty and the Holroyd Rivers is termed the west (W) in this paper.

Following the discovery of the west coast of the Peninsula by Willem Jansz in the *Duyfken* in about March 1606, Dutch voyagers cruised off the west coast repeatedly before Cook sailed through Endeavour Strait in 1770. In contrast to the intensive collecting that went on in the north, the west received very few collectors. M'Lennan found the blue-breasted pitta to be common in the riverine rain forest of the Batavia River (Wenlock River) and Ducie River. He visited the Archer River from Thursday Island, by boat in May 1914, landing at the mouth of the Batavia River and in Albatross Bay on the way. He spent June and July (the dry season) of that year and April 1915 in the Archer and Watson River areas collecting for William Macgillivray (1917-18). The Watson River area is the only locality of the west which appears in Mathews' profuse nomenclatural work. Among the four species that Mathews described from this area between 1917 and 1920 was the golden-winged parrot revealing the northern limit of its range. Thomson went to the west by boat in the wet season of 1932-33 and stayed on till August travelling up the Archer and Watson Rivers and south towards Keerweer along the coast. He spent a further two months at "Mapoon" on the Lower Batavia River. Among his findings were the white-eyed duck on the Archer River, large flocks of the little corella in the mangroves at the mouth of the Archer River and the glossy ibis on swamps of the Batavia River (Thomson, 1935). A survey of cranes in 1969 produced the northernmost record of the Sarus crane from the Archer River (Blackman, 1971).

Many rain forest species of the east, including the scrub fowl, yellow-billed kingfisher, little scrub-wren, frill-necked flycatcher, grey whistler and magnificent rifle-bird, are found in rain forest patches around Weipa (Kikkawa, 1975). Many species have been added to the list of birds of Weipa by Michael and Luke O'Reilly, including the crested hawk, wompoo pigeon, curlew sandpiper, black-eared cuckoo, chestnut-breasted cuckoo and satin flycatcher. In our most recent visit to Weipa (February, 1976) David Thomae recorded a streaked fantail-warbler (streaked grass-warbler) which requires confirmation.

South west

South of the Holroyd River open forest is replaced by low open woodland with *Melaleuca viridiflora*. The typical alluvial plains of the Gulf country appear in the south west where channels, levees, flood basins and meanders form intricate patterns of drainage, particularly along the Mitchell River. This region has very low gradients of less than 0.5 per cent and is subject to flooding in the wet season. The coastal fringe is occupied by grassland, tidal swamps, winding channels and bare flats. Mangroves are not well developed. South of the Holroyd River inland to Ebagoola and the Dividing Range is termed the south west (SW) in this paper.

The Dutch Commanders Jan Carstenszoon and Coolsteerdt sailed in

the *Para* and *Arnhem* along the west coast, landing in May 1623,and wrote of the land of this region as "a dry and barren tract, without any fruit trees or anything that man could make use of. It is low and flat, without mountains or heights ... in our judgement this is the dryest and barrenest region that could be found in the world" (Jack, 1921). The expedition of Ludwig Leichhardt to the Gulf country reached the Mitchell River from the south in 1845. John Gilbert was on this expedition collecting for Gould, but met a tragic death from a native spear on the day (28 June) he collected the type specimen of the black tree-creeper, which Gould described in 1846. Its type locality, the Nassau River at 15°57'S, is the only type locality of bird species in the western region of the Peninsula.

Thomson (1935) visited the south west of the Peninsula following the Coleman River to the coast in August 1928 and worked at the Mitchell and Edward Rivers for two months. He found the graceful honeyeater taking the place of the lesser Lewin honeyeater on the rivers of the Gulf of Carpentaria. If confirmed this will be the only region in Australia where the former occurs outside the range of the latter. Among other species he collected in this region were the red-crowned pigeon, marbled frogmouth, rufous shrike-thrush, dusky honeyeater, rufous-banded honeyeater, tawny-breasted honeyeater, white-gaped honeyeater, red-browed finch, pale crimson finch, yellow oriole and great bower-bird. H. A. Standfast visited the Mitchell River area in 1965 and compiled a preliminary list of birds (Standfast, 1965). This list was enormously enlarged by Robert Domrow (1967), who conducted a survey of intranasal mites of birds in the dry and wet seasons during the period 1964 to 1966. He recorded many species of water birds for the first time from this part of the Gulf of Carpentaria. The survey of cranes in Queensland in 1969 by the Primary Industries Department of Queensland recorded the Sarus crane between the Nassau and the Mitchell Rivers (Blackman, 1971).

(Part 2, including the references, and the Appendix,listing the birds, will appear in a subsequent issue of The Sunbird.)

DR J. KIKKAWA, Department of Zoology, University of Queensland, St Lucia, Queensland, 4067.

NESTING OF THE SQUARE-TAILED KITE

A.C. CAMERON

SUMMARY

Some nineteenth century nest records of the square-tailed kite are listed, and a report of the nesting activity since 1969 of a pair in the Chinchilla district of Queensland is given. More intensive observations in 1975 provided details of the nesting programme, feeding habits and relations with other species in the vicinity of the nest. Juvenile plumage is described.

In nineteenth century literature there are several references to nesting of the square-tailed kite, *Lophoictinia isura*. In November 1839 John Gould found two eggs in a nest near Scone, New South Wales, and his associate John Gilbert found two young in a nest in Western Australia. E.H. Lane found several nests near Dubbo, New South Wales, in the 1880's, always with three eggs, and on 30 October 1885 A.J. Campbell and H.G. Barnard found two eggs in a nest near Duaringa, Queensland. Barnard also records three nests at the same place in September-October 1907. Mainly on Barnard's evidence, Campbell gives "the last three months of the year" as the nesting period. However G.A. Keartland found a young bird in a nest near Lake Augusta, Western Australia, as early as July 1896, during the early part of the Calvert expedition (Campbell, 1901; North, 1912.)

Little additional evidence appears to have been published since the early years of the present century. Macdonald (1973) notes that the bird's habits are not well known, and that there are few data about its breeding.

My own records date from 1950 when I observed a bird, carrying a stick in its claws, in the tall timber along Wieambilla Creek, south west of Chinchilla, Queensland (26°50'S,150°20'E). When it saw me it dropped the stick and flew back in the direction from which it had come. Perhaps because that area was seldom visited I had no further sightings until 1969. In that year a nest containing two partly incubated eggs was found near the same spot on 26 October, 20 m up in an *Angophora intermedia*. In 1970 a new nest was built just across the creek. The 1971 nest was higher up in the same tree. In subsequent years this pair has nested within 300 m of the original spot, and always in a tree within a few metres of the water's edge. Bushy angophoras are preferred. The 1970 nest was rebuilt and used again in 1975, presumably by the same pair. This was at 21 m in a horizontal angophora fork, with several small vertical twigs as support (Fig. 1). It seems

possible therefore that this pair of square-tailed kites has nested regularly in the same vicinity for at least a quarter of a century. They have reared one young in most years, but in 1974 and 1975 succeeded in fledging two. No nesting attempt is known to have failed.

The nesting bird's habits are unobtrusive, almost furtive. The brooding bird sits closely, practically invisible from below, from where it cannot be flushed. Campbell (1901) succeeded in flushing

Figure 1. Adults and young square-tailed kites at the nest. Note the distance the folded wings extend beyond the tail in the adult.
(Photo: Christopher Cameron).

the bird by throwing a stick half way up to the 30 m high nest, but I have approached a brooding bird within 5 m without disturbing her.

The nest is bulky, and as far as I know is always the square-tailed kites' own work. My own evidence corroborates Campbell's (1901) note that a nest is sometimes used again, in the same or subsequent years. Larger sticks in the foundation are approximately 600 mm long x 10-15 mm thick. Smaller twigs are used on top, and the nest cup is lined with fresh green leaves, renewed almost daily. The normal height of 20 - 30 m above ground makes close inspection difficult, but the 1969 nest measured 482 mm across x 228 mm deep. The nest cup was 203 mm x 63 mm.

All the nests examined held two eggs. The ground colour of the eggs is buffy white, with variable amounts of dark brown spots and blotches. The surface of the shell is smooth, with some hard excrescences, and a slight gloss. Of four eggs measured the long axis varies from 47.6 - 52.7 mm, averaging 50.1 mm; the short axis 39.6 - 41.4 mm, averaging 40.5 mm.

From early October 1975 when the young were small, a watch from 6 m was kept on the nest from a hide erected by Jack Cupper of Mildura. This provided an ideal base for subsequent detailed observation and photography. Neither adults nor young showed alarm or aggression at this invasion of their privacy; in fact, they ignored us.

A fairly rigid pattern of adult behaviour had already been noted. The female spent nearly all day at the nest, while the male hunted. As the young grew she sat for long periods on the rim, or moved out on to an adjoining branch. She usually left the nest once each day, shortly after midday, presumably to feed herself, since she was never observed to feed at the nest.

The only food brought in by the male was freshly killed birds, from a considerable distance away. His approach through the tree tops was first signalled by alarm calls from noisy miners *Manorina melanocephala* and others, audible for at least half a kilometre. Sometimes he came straight to the nest to deliver his prey, at others he circled the vicinity for a short time first. Once he perched for some minutes in a nearby tree. His stay at the nest was just sufficient to desposit his prey, never more than four seconds. He then often flew to a dead tree 40 m away, resting there for up to 20 minutes. Twice he flew to an upper branch of the nest tree. With one possible exception, thought to be an adult Australian pipit *Anthus novaeseelandiae*, his prey was invariably nestlings, probably noisy miners, generally two at a time. Campbell's (1901) evidence is similar, and he mentions that a nest of fuscous honeyeaters *Meliphaga fusca* , with a dead fledgling clinging to its edge, was found in one square-tailed kite nest.

Once, the male gave a dramatic demonstration of his power of flight.

Immediately after leaving the nest at midday he flew into a thermal. He at once increased his wing dihedral angle from almost horizontal to sharply upswept. Then, without circling, but rocking slowly from left to right bank, he rode the current up from 50 m to an estimated 1,000 m, at which altitude he was invisible to the naked eye, in 12 seconds.

While the young were small, the female proceeded to tear the prey into strips and small pieces, which she fed to the chicks. There was little or no competition between them. After 1 November they always handled their own, and were soon able to swallow the nestlings whole.

In the crop of an adult square-tailed kite shot at Carlingford, New South Wales on 9 September 1895, and sent to the Australian Museum, there were seven unfledged young birds.

The amounts of food brought in by the male remained fairly constant, in spite of the increasing size of the two young. However, it was eaten more quickly, and more time was devoted to other activities, including preening, nest building and practising for flight. Unlike most young birds, they were not seen to compete or clamour for food; in fact, except for eating in large gulps, their table manners were exemplary!

On 1 November there was a notable disparity in size and plumage development. The larger nestling had already shed most of the white down from its head and neck, and dark feathers were beginning to show on its breast and wings. The smaller nestling was completely white except for the head, where the down may have been rubbed off by contact with the brooding female. Both nestlings devoted considerable time to removing the remaining down from their breasts and wings. Each feather was carefully followed towards its tip with the bill, at which time the eyes were closed. Dark stripes soon appeared on the breast, becoming progressively wider and longer as the powdery down disintegrated. So great was their preoccupation with plumage conditioning that, when all the down had gone, both birds emerged in truly magnificent juvenile plumage, which they maintained in immaculate condition. At this stage the crown, neck, shoulders, upper mantle, breast and underwings are bright, rich chestnut, with a fine black line down the shaft of each breast feather. The face, chin and throat are greyish white, the ear patch black, the cere blue-grey and the bill grey darkening to black at the tip. Below the centre of the breast the colour becomes paler grading to trousers which are light buff. The tail is dark brown, with a narrow white tip. The wings and remainder of the upper surface are dark brown, with some buff feathers giving a mottled appearance. The under tail coverts are light chestnut, with fine, dark bars. The legs and feet are pinkish white, with black claws. The iris is dark brown, in strong contrast to the very pale yellow iris of the adult.

Fresh, green leaves were now being added to the nest each day before 07:00; by midday they were wilted and by evening quite shrivelled. When not otherwise engaged the larger chick showed some interest in them, and spent some time picking up leaf clusters, and rearranging them into different positions. It progressively lost interest as they dried out, and after midday ignored them.

In contrast to most young hawks, the square-tailed kites kept their nest moderately clean. It did become dirtier in time, but both young always backed to the outer extremity of the nest before voiding a stream of excrement over the side.

Some idea of the daily activity at the nest is given by the following observations from 07:00 on 2 November. The female and two young were in the nest with the male 12 m away in the same tree. Fresh green eucalypt leaves were already in place. Shortly afterwards the male flew away, right out of sight. At 08:00 he returned with two nestlings, probably friar-birds *Philemon* sp. or noisy miners, each of which was taken by one of the young square-tailed kites and eaten whole. At 08:35 the female left the nest, a good deal earlier than her usual midday sorties, and flew out of sight. At 08:40 the male returned with an adult pipit. The larger chick tried unsuccessfully to swallow it, then surrendered it to the smaller, who by 09:40 had pulled off and swallowed one leg, and by 10:40 had finished eating it. At 10:30 the female returned,apparently well fed, and remained at the nest for the rest of the day. At 13:30 the male brought two more young birds, still in pin feathers and with yellow legs, probably noisy miners. The young took one each, and eventually swallowed them whole. At 16:30 he brought two more young birds, well feathered and larger, possibly noisy friar-birds *P. corniculatus*. The young took one each, and with much difficulty finally swallowed them. That was the last visit of the male before dark. His tail feathers were much abraded, and I speculate that he may have done his share of brooding earlier.

On 10 November the nest was watched from 17:00 - 18:00. The larger young, now entirely clear of down, was exercising its wings by flapping strongly, and actually became airborne from one side of the nest to the other. The smaller young was resting quietly, only occasionally visible from below. The female was beside the nest and the male was out of sight.

On 16 November the female and two young were in the nest at 17:00. The male approached the nest several times with two birds over 15 minutes before delivering them. He remained three seconds, then perched 10 m higher in the same tree, where he remained till dark. This was my last visit to the nest. The young are thought to have left the nest about the end of November.

Calls between female and chicks, and between male and female, were

low key, and sparingly used. The approach of the male was noted by the female with a weak, high pitched twittering note,repeated at one to two second intervals. It seemed to alert the young if they were asleep. The male sometimes acknowledged with a similar call. The young had a soft, chattering note, seldom used and scarcely audible from the ground. One observer described the call of the female after leaving the nest as"a shrill chatter like a collared sparrowhawk *Accipiter cirrocephalus* but quieter."

I found the square-tailed kites' behaviour towards other birds and human observers, and behaviour of other birds towards the square-tailed kites, quite remarkable. In contrast to most other raptores that prey on live birds, the nesting square-tailed kites' behaviour seemed placid and undisturbed by all that went on around and below them. Numerous observers walked around in full view below the nest, talking freely, without exciting any interest at all. As the male approached the nest he sometimes circled briefly, scrutinising the various vehicles, dogs and humans. Just as often he went straight to the nest. Occasionally the female showed mild aggression by erecting her head feathers, and facing the observer with open bill. This threat posture was maintained for about three seconds. None of them took more than the most fleeting and casual interest in observers climbing or descending the tower, sometimes remaining in full view below the hide for long periods.

As far as other birds were concerned, there was a clearly defined neutral zone, centred on the nest and with a radius of about 200 m within which the square-tailed kites represented no threat. Beyond this zone, their appearance triggers off a medium panic. As the male approached he was fiercely challenged by many birds until he crossed into the neutral zone. Alarm calls within this zone by any other species were rare, and aggressive attacks virtually non existent. A similar pattern was noted at the same time in the case of a much noisier nesting Australian little eagle *Hieraaetus morphnoides* approximately 100 m away, with one chick.

A list of 44 bird species was compiled in the immediate vicinity. Many of these are potential food, and at least a dozen were nesting. Yet they used the area as though the square-tailed kites were not there, often flying or perching within a metre of the nest or the male nearby. A little friar-bird *P.citreogularis* actually had a nest under construction five metres above. This pattern of mutual tolerance has been observed with other nesting raptores, including Australian goshawk *Accipiter fasciatus*, crested hawk *Aviceda subcristata*, and letter-winged kite *Elanus scriptus* (Cameron, 1974). The explanation is that birds of prey never hunt near their nests. This enables them to move freely in the vicinity without attracting much attention, thus preserving a cryptic situation, which no doubt increases the probability of success in rearing a brood. It probably explains why nesting square-tailed kites are so difficult to find, though moderately conspicuous at other times.

REFERENCES

Cameron, A.C. 1974. Nesting of the Letter-winged Kite in Western Queensland. Sunbird 5 : 89-95.
Campbell, A.J. 1901. Nests and Eggs of Australian Birds. Sheffield : Pawson and Brailsford.
Macdonald, J.D. 1973. Birds of Australia. Sydney : Reed.
North, A.J. 1912. Nests and Eggs of Birds Found Breeding in Australia and Tasmania. Sydney : F.W. White.

MR A.C. CAMERON, "Rockwood", Chinchilla, Queensland, 4413.

****

WHITE-THROATED TREE-CREEPER ROOSTING IN A CAVE

B. MACKNESS

The Talangai Caves in Lamington National Park (28°21'S,153°05'E) are a wind-eroded tuff formation in an open eucalypt forest. On 8 September 1975, bird droppings were observed on the floor of one of the caves and at about 20:00 the next day a white-throated tree-creeper *Climacteris leucophaea* was found roosting in the cave. The bird was in a horizontal position, being flush with the ceiling. It was holding on by pressing its claws into the soft tuff. Another inspection about midnight revealed the bird to be asleep in the same position. The amount and condition of the droppings suggested that this roosting site had been used previously.

It would be expected that white-throated tree-creepers roost in holes in trees and not in caves.

MR B. MACKNESS, National Parks and Wildlife Service, P.O. Box 190, North Quay, Queensland, 4000.

A WHITE NODDY IN NORTH QUEENSLAND

A.C.M. GRIFFIN

On 4 February 1976, Mrs J. Christie found a white noddy *Gygis alba* on her land at Ingham (18°40'S,146°09'E). The exhausted noddy was taken to Mrs J. Birkett for care. She tried to feed fish to the bird but it had great difficulty in swallowing and took four very small pieces only. The bird died on 7 February 1976.

Fortunately Mrs Birkett brought the noddy to Townsville for identification. There was no mistaking that it was a white noddy: an all white bird with typical slightly uptilted black bill. The plumage was white except for a very small patch of tiny black feathers in front of the eye and contiguous with the black eyelid. This was more noticeable when I first saw the bird, which had thawed out on the way from Ingham, than it is now in the skin. The bases of the feathers on the crown were dark grey and the shafts of the wing and tail feathers dark brown except for about the top third of two primaries which were white. The bill was black, though angled to the light it could look a deep blue; the legs and feet were very dark grey to black and the webbing between the toes a creamy white.

The bird appeared thin with the breast bone very prominent. W.R. Dowd, Museum Curator, School of Biological Sciences, James Cook University of North Queensland,who has preserved the skin as a study mount (J.C.U.N.Q. 0.57) told me that the crop, gizzard and gut were empty and flight muscles degenerated suggesting lack of food or great activity or both.

Weather conditions in the Ingham area at the time were bad with strong to gale force east winds and much rain. Cyclone "Alan" had been active in the area, crossing the coast near Cooktown on 2 February 1976.

Mr Dowd gave me the following details. The bird is a female, its ovary measuring 3x2 mm with no follicles. Measurements in millimetres: total length 300, culmen (without cere) 41, wing 228, wing spread 670, tail 105, tarsus 15, mid toe without claw 20. Total weight 70 g.

The third primary (distal to proximal), fourth secondary in the left wing and fifth in the right wing were in the large pin stage, and the fourth secondary feather in the right wing was in the small pin stage. There was no moult.

The skin is to be lodged at the Queensland Museum with the first

Queensland on shore record found at Meeandah near the mouth of the Brisbane River on 30 April 1973 (Vernon, 1973).

Vernon (1973) gives a résumé of previous Australian records of the white noddy (white tern). Greensmith (1973) recorded a white noddy (white tern) flying in a north-easterly direction about 200 metres off shore from Point Lookout, the north eastern point of Stradbroke Island,on 20 May 1973. Mr Barry Laver of the Cape Cleveland Lighthouse, near Townsville, reported a single white noddy at Salamander Reef near Cape Cleveland on 8 June 1973. The bird flew within 6 metres of his boat several times and was seen very clearly (Laver pers. comm.).

From the literature available to me there appears to have been no Queensland record since 1973 and none previously as far north as Ingham, a considerable distance from the nearest known breeding colonies on Norfolk Island.

REFERENCES

Greensmith, A. 1973. A sight record of the White Tern in South-East Queensland. Sunbird 4 : 55-56.

Vernon, D.P. 1973. The first Queensland record of the White Tern *Gygis alba*. Sunbird 4 : 38-40.

MS A.C.M. GRIFFIN, P.O. Box 1305, Townsville, Queensland, 4810.

****

REVIEW : SOME PICTURE BOOKS ABOUT BIRDS

AUSTRALIAN BUSH BIRDS IN COLOUR by I. and M. Morcombe, 1974. Sydney: Reed. 107 pp, 16.5x17.5cm. Price: $4.95.

AUSTRALIAN BIRD WONDERS by H. Frauca, 1974. Adelaide : Rigby. 111pp, 28x20.5cm. Price: $4.95.

EVERY AUSTRALIAN BIRD ILLUSTRATED, edited by P. Wade, 1975. Adelaide : Rigby. 320pp, 31.5x23cm. Price: $24.95.

These three books are dissimilar, both in their intended scope and their level of artistry, but they clearly represent the range from good to bad available in popular picture books on birds. There are several of this type of book now on the market or in preparation, and it is timely to consider what purposes they serve, other than the pecuniary ones of author and publisher.

The Morcombe book is the smallest and most modest in approach. Forty-nine species are illustrated in colour photographs, most as

full page plates, while ink sketches are frequently interspersed with the text. Most of the photographs are of birds in natural situations, often around the nest or on flowers, and only a few show signs of having been set up (*e.g.* a kookaburra taking meat from a branch), or having been taken in studio or aviary (*e.g.* king parrot). Morcombe has previously established himself as an artist with the camera and this skill is again amply demonstrated. The composition of many photographs (*e.g.* scarlet robin, orange chat) is good and colour saturation generally excellent. Bird photographers will appreciate his successes with smaller species, such as the wrens, especially the rufous-crowned emu-wren. There is little room for complaint. One or two photographs are ordinary, the red-backed wren is slightly over-exposed, and ambient light (or printer's error?) has created ghosting in the otherwise excellent one of the galah showing the underwing pattern. Each photograph is accompanied by up to one page of text which gives basic information on distribution, nesting, habits and the distinctive features of each bird's biology. The text is clear, informative and generally free of clichés.

Mr Frauca's book has more text, which is interspersed with colour and black and white photographs. The text rambles through many interesting aspects of the biology of the various groups of birds, with an emphasis on behaviour. This predilection is explained in the introduction where reference is made to concepts in ethology. This seems unnecessary in such a book and, in light of particular descriptions of behaviour, appears affectatious. This authoritative style may be misleading when such statements as "They (honeyeaters) all feed on nectar, pollen and insects" (p50) are made.

Those photographs which are technically acceptable tend to be of easily photographed species, nests with eggs, or are the head only type. Many of the monochromes serve no useful purpose, *e.g.* the blurred shot of a young plover running away. The most objectionable feature is Mr Frauca's persistence in presenting photographs of sick, distraught or overhandled specimens. Birds open their bills to ingest or carry food, to vocalise, to pant or when they are poked or molested. There are almost twenty specimens with bill open that don't appear to be vocalising, eating or carrying objects. An azure kingfisher propped between several twigs, its tail drooping, bill open and pointing skyward is captioned " ... in 'fright' posture". I would accept only that it had recently suffered from severe shock. There are many other examples of this sort of thing.

Every Australian Bird Illustrated is an extravaganza of approximately 700 species portraits, about 80% in photographs and the remainder in paintings. The work of 87 photographers is represented, and the painters are from Gould to the present.

The publisher's claim that it is the "only book to illustrate all Australian birds in full colour action photographs and paintings"- which, to say the least, is confusing - and that "Each bird is shown in natural surroundings". I could see chicken netting in at

least three photographs, two specimens are being hand held for the camera and many of the parrots are photographed in the studio or aviary. However, many good photographers are represented. I especially enjoyed those of the grey-headed honeyeater (Chaffer), white-browed wood-swallow (Seyfort) and the ruddy turnstone (Chapman). The section on terns is excellent and will undoubtedly help in recognition of this difficult group. At the other end of the scale are a few 'box brownie' shots included to broaden the coverage, *e.g.* crimson chat (compare this with Morcombe's photogragh) and yellow oriole. Each photograph is accompanied by a short description and the book is introduced by an illustrated chapter outlining the various Australian habitats. This section is a little weak, perhaps aimed at an audience that restricts itself to picture books and T.V. The monochromes of various habitat types are good except that the one purporting to show tropical rain forest actually shows a few riverine palms in a tall sclerophyll forest, that of tropical heathlands includes no heath, and the example of mangroves is extremely poor.

Comparing these books one finds that their approaches are quite different. "Every Australian Bird Illustrated" would appeal to most, particularly to the non-birdwatcher. It is an expensive coffee table book: the sort that you might appreciate receiving as a gift. The bird-watcher, while enjoying many of the plates,will be disappointed that, in their effort to be "first", the publishers have been forced to include mediocrity to approach complete coverage. You will gain pleasure flipping through the pages, but will be enlightened little. Education and intrigue are Frauca's pitch. However, since the text is pretentious but generally poor, and the photography ranges from ordinary to atrocious, I could not recommend this book to anyone: to me it represents an unfortunate form of bird exploitation. Morcombe and Morcombe do achieve a good balance of accurate, readable basic information and artistic, skilfully taken photographs. Their success lies in the limited scope and the professionalism. Species are selected for which the authors have good photographs and the text is kept concise and factual without being skimpy. Those who buy it will own an attractive little book.

With good equipment and plenty of time, many people can take average or even good photographs. To consider publishing, one should have excellent photographs, which do not automatically flow from more expensive equipment. People like Michael Morcombe and Stan Breeden are artists with the camera and their work appeals to photographer and non-photographer alike. To be useful, the text must be lucid, informative and, above all, accurate. Picture books like these compete for the gift market; make sure that the gift you select is worthwhile.

David Gravatt.